example, Figure 14.5[43] shows MyPlate in Vietnamese. This image would be accompanied with written information about food groups that include the client's typical dietary choices.

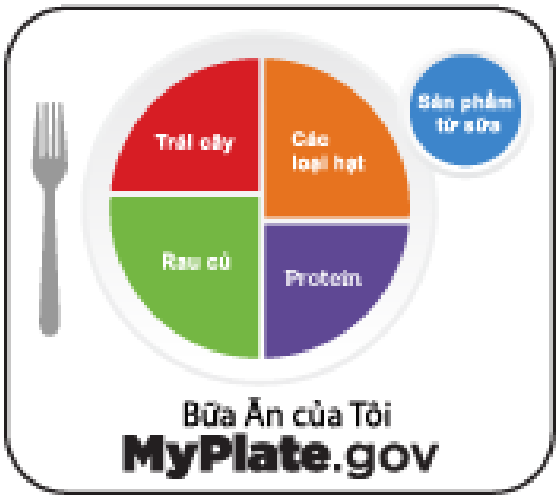

Figure 14.5 MyPlate in Vietnamese

VEGETABLE GROUP

For a well-rounded diet, a variety of vegetables should be consumed, including vegetables from all five vegetable groups: dark green leafy vegetables; red and orange vegetables; beans, peas, and lentils (formerly called the legumes group); starchy vegetables; and other vegetables. Vegetables can be fresh, frozen, canned, or dried. Dark green leafy vegetables include kale, Swiss chard, spinach, broccoli, and salad greens. Red and orange vegetables include carrots, bell peppers, sweet potatoes, tomatoes, tomato juice, and squash. The beans, peas, and lentils group includes dried beans, black beans, chickpeas, kidney beans, split peas, and black-eyed peas. (Note that this group does not include green beans or green peas.) This vegetable group also supplies some protein and can be included in the protein group as well. Starchy vegetables include root vegetables, such as potatoes, as well as

43. "MyPlate_Vietnamese.png" by USDA is licensed under CC0

corn. The “other vegetables” category includes any vegetable that doesn’t fit in the other four categories, such as asparagus, avocados, brussels sprouts, cabbage, cucumbers, snow peas, and mushrooms, and a variety of others.

Daily serving suggestions of vegetables for individuals with a 2,000 calorie diet are 2 ½ cup equivalents of vegetables per day. For example, a “one cup equivalent” equals 1 cup raw or cooked vegetables, one cup 100% vegetable juice, ½ cup of dried vegetables, or 2 cups of leafy green vegetables. Approximately 90% of Americans do not meet the recommended daily intake of vegetables.[44] See Figure 14.6[45] for an image of vegetables.

Figure 14.6 Vegetables

GRAIN GROUP

Grains are classified as whole grains or refined grains. **Whole grains** include the entire grain kernel and supply more fiber than refined grains. Examples of whole grains include amaranth, whole barley, popcorn, oats, whole grain cornmeal, brown or wild rice, and whole grain cereal or crackers. **Refined**

44. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

45. “Food-healthy-vegetables-potatoes_(23958160949).jpg” by www.Pixel.la Free Stock Photos is licensed under CC0

grains have been processed to remove parts of the grain kernel and supply little fiber. As a result, they quickly increase blood glucose levels. Examples of refined grains include white bread, white rice, Cream of Wheat, pearled barley, white pasta, and refined-grain cereals or crackers. Some grains are fortified to ensure adequate intake of folic acid. See Figure 14.7[46] for an image of whole grain whole wheat bread.

The daily serving suggestions of grains for an individual with a 2,000-calorie diet are six-ounce equivalents per day, split equally between whole and refined grains. For example, a "one ounce equivalent" of grains equals ½ cup of cooked rice, pasta, or cereal or 1 cup of flaked cereal. Most Americans consume adequate amounts of total grains, although roughly 98% are deficient in recommended whole grain amounts, and 74% consume more than the recommended refined grain amounts.[47]

46. "front_en.3.400.jpg" by openfoodfacts-contributors is licensed under CC BY-SA 3.0

47. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

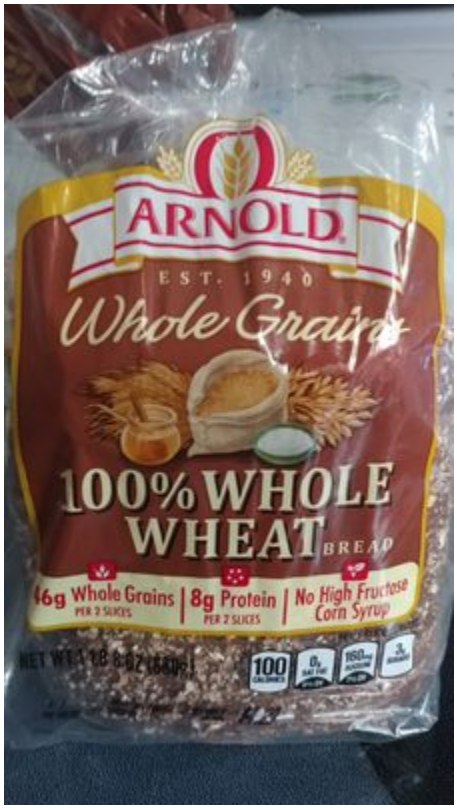

Figure 14.7 Whole Grain, Whole Wheat Bread

FRUIT GROUP

Fruits can be frozen, canned, or dried, in addition to 100% fruit juice. A few examples of fruits include apples, oranges, bananas, melons, peaches, apricots, pineapples, and rhubarb. Daily serving suggestions of fruits for an individual with a 2,000-calorie diet are 2 cup equivalents per day. For example, “one cup equivalent” equals 1 cup of raw or cooked fruit, 8 ounces of 100% fruit juice, or ½ cup of dried fruit. Approximately 80% of Americans do not

consume the recommended daily intake of fruits.[48] See Figure 14.8[49] for an image of fruits.

Figure 14.8 Fruits

DAIRY GROUP

Dairy products can be liquid, dried, semi-solid, or solid depending on the type of product. Dairy products include milk, lactose-free milk, fortified soy milk, buttermilk, cheese, yogurt, and kefir. Sour cream and cream cheese are not considered dairy items in terms of nutritional benefits. Daily serving suggestions of dairy products for an individual with a 2,000-calorie diet are 3 cup equivalents per day. For example, "one cup equivalent" equals 1 cup of milk, soy milk, or yogurt; 1 ½ ounces of natural cheese, or 2 ounces of processed cheese. Approximately 90% of Americans consume less than the

48. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

49. "Culinary_fruits_cropped_top_view.jpg" by Bill Ebbesen is licensed under CC BY 3.0

recommended daily intake of dairy products.[50] See Figure 14.9[51] for an image of dairy products.

Figure 14.9 Dairy Products

PROTEIN GROUP

Proteins are categorized by the type of protein source. The meats, poultry, and eggs category consists of any type of animal or poultry meat, organ meat, or poultry egg. Lean meats should be selected to minimize fat and calorie intake from high-fat meats.

The seafood category includes any type of fish, clams, crab, lobster, oyster, and scallops. It is important to choose fish with low mercury levels to prevent

50. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

51. "Good_Dairy_Sources.png" by Brookepinsent is licensed under CC BY-SA 4.0

negative effects of a buildup of mercury in the body. In general, large, fatty ocean fish, such as tuna, have higher levels of mercury due to their diet and storage of mercury in their fatty tissues.

The nuts, seeds, and soy products category includes tree nuts, peanuts, nut butters, seeds, or seed butters. Soy products include tofu and any other products made from soy. Unsalted nuts should be selected to avoid excess salt intake.

Protein is also contained in other food groups, such as dairy or the vegetable category of peas, beans, and lentils. Daily serving suggestions of proteins for individuals with a 2,000-calorie diet are 5 ½ ounce equivalents per day. Servings should total up to 26-ounce equivalents per week of meats, eggs, and poultry; 8-ounce equivalents per week of seafood; and 5-ounce equivalents per week of nuts, seeds, or soy products. A "one ounce equivalent" of protein equals 1 ounce of lean meat, one egg, ¼ cup cooked beans, or 1 tablespoon of peanut butter. Most Americans consume adequate amounts of protein, but many consume proteins high in saturated fat and sodium that contribute to diseases such as coronary artery disease.[52]

OIL/FAT GROUP

Examples of oils are vegetable oil, canola oil, olive oil, butter, lard, and coconut oil. Daily serving suggestions of fats or oils for individuals with a 2,000-calorie diet are 27 grams per day. While it is important to limit oils and fats due to their calorie-dense nature, some fat and oil intake is essential for nutrient absorption and overall health. It is best to select healthy unsaturated fats, such as avocados, nuts, or olive oil.[53]

52. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

53. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

Gender

A person's gender affects their calorie and nutrient requirements. Males typically have higher calorie and protein needs related to increased muscle mass. Females typically require fewer calories to maintain their body weight due to a higher proportion of adipose (fat tissue) than muscle. Menstruating females also have higher iron requirements to offset losses that occur during menstruation.

> Read Nutrition and Food Safety Information and Resources for Healthcare Professionals from the U.S. Food and Drug Administration.

Factors Affecting Nutritional Status

Now that we have discussed basic nutritional concepts and dietary guidelines, let's discuss factors that can affect a person's nutritional status. Many things that can cause altered nutrition, such as physiological factors, cultural and religious beliefs, economic resources, drug and nutrient disorders, surgery, altered metabolic states, alcohol and drug abuse, and psychological states.

Physiological Factors

Nutritional intake is affected by several physiological factors. Appetite is controlled by the hypothalamus, a tiny gland deep within the brain that triggers feelings of hunger or fullness depending on hormone and neural signals being sent and received. See Figure 14.10[54] for an image of the hypothalamus indicated by the red arrow. Hunger causes a feeling of

54. "Hypothalamus.jpg" by Methoxyroxy~commonswiki is in the Public Domain

emptiness in the abdomen and is often accompanied by audible noises coming from the abdomen as the stomach contracts due to emptiness. Hunger can cause feelings of discomfort, nausea, and tiredness. Satiety is a feeling of fullness that often comes after eating, although it can also be caused by impairments of the hypothalamus. Electrolyte imbalances and fluid volume imbalances can also trigger hunger and thirst by sending signals to the hypothalamus.[55]

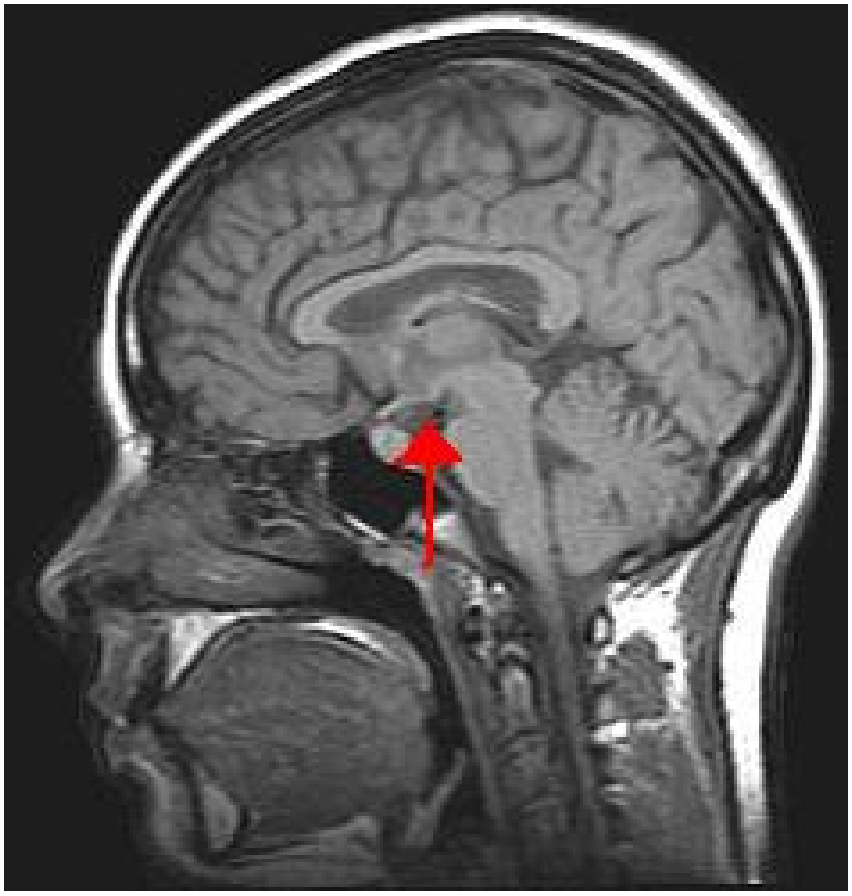

Figure 14.10 Hypothalamus

55. Fialkowski Revilla, M. K., Titchenal, A., Calabrese, A., Gibby, C., & Meinke, B. (2017). *Human nutrition [deprecated]*. University of Hawai'i at Mānoa Food Science and Human Nutrition Program. https://pressbooks-dev.oer.hawaii.edu/humannutrition/

The five senses play an important role in food intake. For example, food with a pleasing aroma may induce mouth watering and hunger, whereas food or environments with displeasing aromas often suppress the appetite. Texture and taste of foods also play a role in stimulation of appetite.

Poor dentition or poor oral care has a negative effect on appetite, so adequate oral care is crucial for clients prior to eating.[56] Additionally, the condition of a client's teeth and gums, the fit of dentures, and gastrointestinal function also play an important role in nutrition. Loose teeth, swollen gums, or poor-fitting dentures can make eating difficult.

Difficulty swallowing, called **dysphagia**, can make it dangerous for the client to swallow food because it can result in pneumonia from aspiration of food into the lungs. Special soft diets or enteral or parenteral nutrition are typically prescribed for clients with dysphagia. Nurses collaborate with speech therapists when assessing and managing dysphagia.

A poorly functioning gastrointestinal tract makes nutrient absorption difficult and can result in malnourishment. Diseases that cause inflammation of the gastrointestinal tract impair absorption of nutrients. Examples of these conditions include esophagitis, gastritis, inflammatory bowel disease, and cholecystitis. Clients with these disorders should select nutrient-dense foods and may require prescribed supplements to increase nutrient intake.

Cultural and Religious Beliefs

Cultural and religious beliefs often influence food selection and food intake. It is important for nurses to conduct a thorough client assessment, including food preferences, to ensure adequate nutritional intake during hospitalization. The nurse should not assume a particular diet based on a

56. Fialkowski Revilla, M. K., Titchenal, A., Calabrese, A., Gibby, C., & Meinke, B. (2017). *Human nutrition [deprecated]*. University of Hawai'i at Mānoa Food Science and Human Nutrition Program. https://pressbooks-dev.oer.hawaii.edu/humannutrition/

client's culture or religion, but instead should determine their individual preferences through the assessment interview.

Cultural beliefs affect types of food eaten and when they are eaten. Some foods may be restricted due to beliefs or religious rituals, whereas other foods may be viewed as part of the healing process. For example, some cultures do not eat pork because it is considered unclean, and others eat "kosher" food that prescribes how food is prepared. Some religions fast during religious holidays from sunrise to sunset, where others avoid eating meat during the time of Lent.[57,58]

> Read more about the impact of religious and cultural beliefs on food intake in the "Spirituality" chapter of this book.

Economic Resources

If a client has inadequate financial resources, food security and food choices are often greatly impacted. Healthy, nutrient-dense, fresh foods typically cost more than prepackaged, heavily processed foods. Poor economic status is correlated with the consumption of calorie-dense, nutrient-poor food choices, putting these individuals at risk for inadequate nutrition and obesity.[59] Social

57. Dindyal, S., & Dindyal, S. (n.d.). How personal factors, including culture and ethnicity, affect the choices and selection of food we make. *Internet Scientific Publications, 1*(3). https://ispub.com/IJTWM/1/2/11779

58. Stewardship. (n.d.). *What is Lent? When does Lent start? What to do during Lent?* https://www.stewardship.org.uk/blogs/what-is-lent

59. Alkerwi, A., Vernier, C., Sauvageot, N., Crichton, G., & Elias, M. (2015). Demographic and socioeconomic disparity in nutrition: Application of a novel correlated component regression approach. *BMJ Open, 5*(5). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4431064/

programs such as Meals on Wheels, free or reduced-cost school breakfast and lunch programs, and government subsidies based on income help reduce food insecurity and promote the consumption of healthy, nutrient-dense foods. Nurses refer at-risk clients to social workers and case managers for assistance in applying for these social programs.

Drug and Nutrient Interactions

Some prescription drugs affect nutrient absorption. For example, some medications such as proton pump inhibitors (omeprazole) alter the pH of stomach acid, resulting in poor absorption of nutrients. Other medications, such as opioids, often decrease a person's appetite or cause nausea, resulting in decreased calorie and nutrient intake.

Surgery

Surgery can affect a client's nutritional status due to several factors. Food and drink are typically withheld for a period of time prior to surgery to prevent aspiration of fluid into the lungs during anesthesia. Anesthesia and pain medication used during surgery slow peristalsis, and it often takes time to return to normal. Slow peristalsis can cause nausea, vomiting, and constipation. Until the client is able to pass gas and bowel sounds return, the client is typically ordered to have nothing by mouth (NPO). If a client experiences prolonged NPO status, such as after significant abdominal surgery, intravenous fluids and nutrition may be required.

Surgery also stimulates the physiological stress response and increases metabolic demands, causing the need for increased calories. The stress response can also cause elevated blood glucose levels due to the release of corticosteroids, even if the client has not been previously diagnosed with diabetes mellitus. For this reason, nurses often monitor post-op clients' bedside blood glucose levels carefully.

Bowel resection surgery in particular has a negative impact on nutrient absorption. Because all or parts of the intestine are removed, there is decreased absorption of nutrients, which can result in nutrient deficiencies.

Many clients who have experienced bowel resection require nutrient supplementation.

Bariatric surgery is used to treat obesity and reduce obesity-related cardiovascular risk factors. Bariatric procedures alter the anatomy and physiology of the gastrointestinal tract, which makes clients susceptible to nutritional deficiencies.[60] Read more about bariatric surgery and long-term nutritional issues in the following box.

> Read more about bariatric surgery and long-term nutritional issues.[61]

Altered Metabolic States

Metabolic demands impact nutrient intake. In conditions where metabolic demands are increased, such as during growth spurts in childhood or adolescence, nutritional intake should be increased. Disease states, such as cancer, hyperthyroidism, and AIDS, can increase metabolism and require an increased amount of nutrients. However, cancer treatment, such as radiation and chemotherapy, often causes nausea, vomiting, and decreased appetite, making it difficult for clients to obtain adequate nutrients at a time when they are needed in high amounts due to increased metabolic demand.

Other diseases like diabetes mellitus cause complications with nutrient

60. Lupoli, R., Lembo, E., et al. (2017). Bariatric surgery and long-term nutritional issues. *World Journal of Diabetes*, *8*(11), 464-474. https://doi.org/10.4239/wjd.v8.i11.464

61. Lupoli, R., Lembo, E., et al. (2017). Bariatric surgery and long-term nutritional issues. *World Journal of Diabetes*, *8*(11), 464-474. https://doi.org/10.4239/wjd.v8.i11.464

absorption due to insulin. Insulin is necessary for the metabolism of fats, proteins, and carbohydrates, but in clients with diabetes mellitus, insulin production is insufficient or their body is not able to effectively use circulating insulin. This lack of insulin can result in impaired nutrient metabolism.

Alcohol and Drug Misuse

Alcohol and drug misuse can affect nutritional status. Alcohol is calorie-dense and nutrient-poor. With alcohol use, the consumption of water, food, and other nutrients often decreases as clients "drink their calories." This may result in decreased protein intake and body protein deficiency. Nutrient digestion and absorption can also decrease with alcohol consumption if the stomach lining becomes eroded or scarred. This can cause hemoglobin, hematocrit, albumin, folate, thiamine, vitamin B12, and vitamin C deficiencies, as well as decreased calcium, magnesium, and phosphorus levels.[62]

Misuse of stimulants, such as methamphetamine and cocaine, causes an increased metabolic rate and decreased appetite and contributes to weight loss and malnourishment.

Psychological State

Various psychological states have a direct effect on appetite and a client's desire to eat. Acute and chronic stress stimulates the hypothalamus and increases production of glucocorticoids and glucose. This can increase the person's appetite, causing increased calorie intake, fat storage, and subsequent weight gain. When a person feels stressed, their food choices are often nutrient-poor and calorie-dense, which further increases weight gain

62. Gramlich, L., Tandon, P., & Rahman, A. (2019). Nutritional status in patients with sustained heavy alcohol use. *UpToDate*. https://www.uptodate.com

and nutrient deficiencies. In other individuals, the stress response causes loss of appetite, weight loss, and nutrient deficiencies.[63]

Depression can cause loss of appetite or overeating. Many people eat calorie-dense "comfort foods" as a coping mechanism. Additionally, many antidepressants can cause weight gain as a side effect.

63. Ulrich-Lai, Y. M., Fulton, S., Wilson, M., Petrovich, G., & Rinaman, L. (2015). Stress exposure, food intake and emotional state. *Stress (Amsterdam, Netherlands), 18*(4), 381–399. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4843770/

14.3 Applying the Nursing Process

OPEN RESOURCES FOR NURSING (OPEN RN)

Now that we have discussed basic nutritional concepts, dietary guidelines, and factors affecting nutritional status, let's apply the nursing process to this information when caring for clients.

Assessment

A thorough nutritional assessment provides information about an individual's nutritional status, as well as risk factors for nutritional imbalances. Assessment starts with reviewing the client's medical record and initiating a client interview, followed by a physical exam and review of lab and diagnostic test results.

Subjective Assessment

Subjective assessments include questions regarding normal eating patterns and risk factor identification. Subjective assessment data is obtained by interviewing the client as a primary source or a family member or caregiver as a secondary source. While a wealth of subjective information can be obtained through a chart review, it is important to verify this information with either the client or family member because details may be recorded inaccurately or may have changed over time. Subjective information to obtain when completing a nutritional assessment includes age, sex, history of illness or chronic disease, surgeries, dietary intake including a 24-hour diet recall or food diary, food preferences, cultural practices related to diet, normal snack and meal timings, food allergies, special diets, and food shopping or preparation activities.

Read more information about common cultural dietary preferences and restrictions in the "Common Religions and Spiritual Practices" section of the "Spirituality" chapter.

A detailed nutritional assessment can also provide important clues for identification of risk factors for nutritional deficits or excesses. For example, a history of anorexia or bulimia will put the client at risk for vitamin, mineral, and electrolyte disturbances, as well as potential body image disturbances. Swallowing impairments place the client at risk for decreased intake that may be insufficient to meet metabolic demands. Use of recreational drugs or alcohol places the client at risk for insufficient nutrient intake and impaired nutrient absorption. Use of nutritional supplements places the client at risk for excess nutrient absorption and potential toxicity. Recognizing and identifying risks to nutritional status help the nurse anticipate problems that may arise and identify complications as they occur. Ideally, the nurse will recognize subtle cues of impending or actual dysfunction and prevent bigger problems from happening.

Objective Assessment

Objective assessment data is information derived from direct observation by the nurse and is obtained through inspection, auscultation, and palpation. The nurse should consider nutritional status while performing a physical examination.

The nurse begins the physical examination by making general observations about the client's status. A well-nourished client has normal skin color and hair texture for their ethnicity, healthy nails, a BMI within normal range according to their height, and appears energetic.

Height and weight should be accurately measured and documented. Height and weight in infants and children are plotted on a growth chart to give a percentile ranking across the United States. The infant or child should show a trend of consistent height and weight increase.

Height and weight in adults are often compared to a **Body Mass Index (BMI)** graph. BMI can also be calculated using the following formulas:

- BMI = weight (kilograms)/height(meters)^2
- BMI = weight (pounds) x 703)/height(inches)^2

To calculate BMI using a BMI table, the client's height is plotted on the horizontal axis and their weight is plotted on the perpendicular axis. The BMI is measured where the lines intersect. See Figure 14.11[1] for an image of a BMI table. BMI is interpreted using the following ranges:

- Less than 18.5: Underweight
- 18.5-24.9: Desirable range
- 25-29.9: Overweight
- Equal or greater than 30: Obese[2]

1. "Bmi-chart_colored.gif" by Cbizzy2313 is licensed under CC BY-SA 4.0

2. Hood, W. A. (2020). *Nutritional status assessment in adults technique*. Medscape. https://emedicine.medscape.com/article/2141861-technique

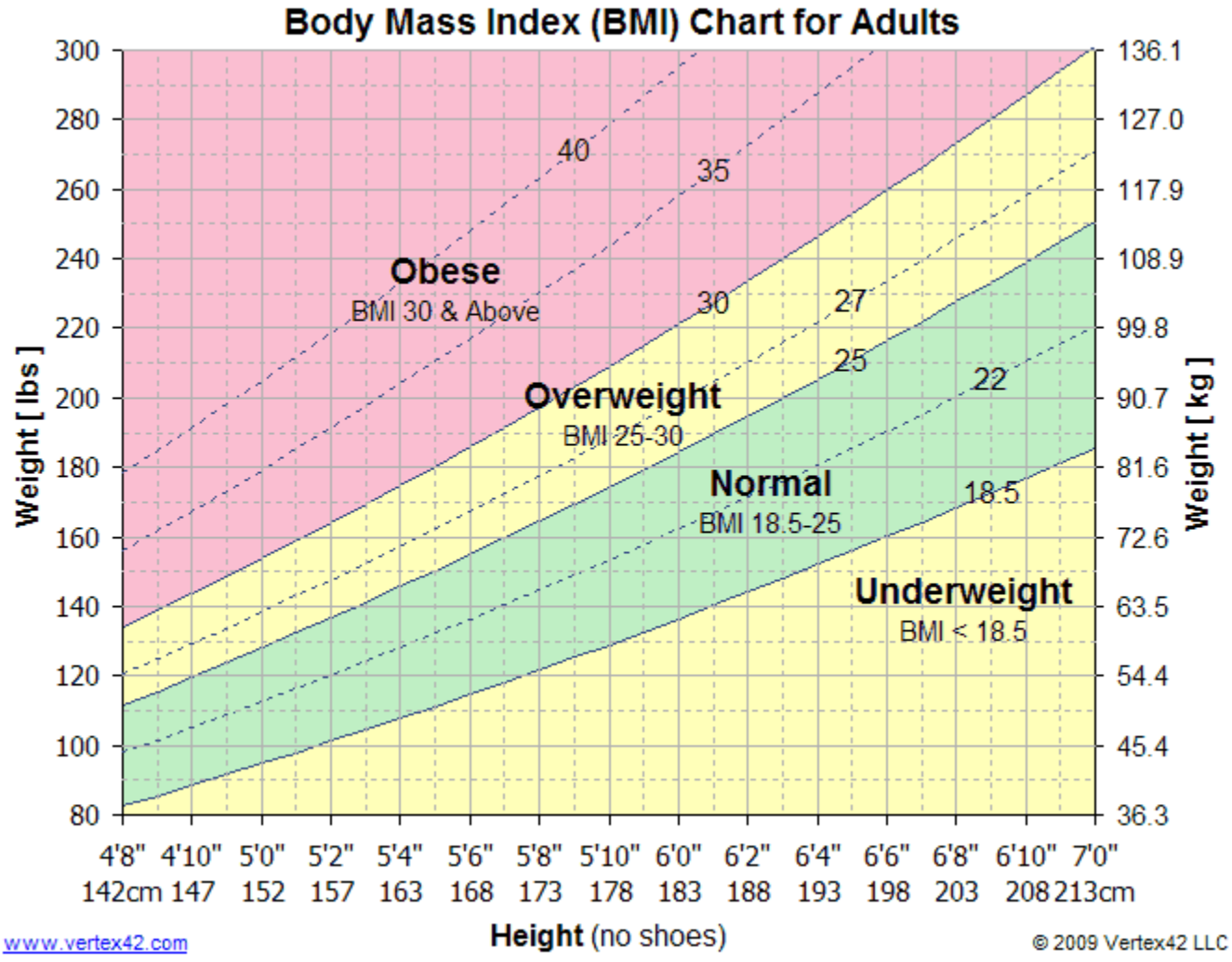

Figure 14.11 BMI Table

After completing the subjective and objective assessment, the data should be analyzed for expected and unexpected findings. See Table 14.3a for a comparison of expected versus unexpected assessment findings related to nutritional status on assessment, including those that require notification of the health care provider in bold font.

Table 14.3a Expected Versus Unexpected Findings During Nutritional Assessment[3]

3. Hood, W. A. (2020). *Nutritional status assessment in adults technique*. Medscape. https://emedicine.medscape.com/article/2141861-technique

Assessment	Expected Findings	Unexpected Findings ***Bolded items are critical conditions that require immediate health care provider notification.**
General appearance	Energetic; normal skin, hair, and nails; and normal weight related to height	Lethargic, skin ulcerations, rashes, bruising, thinning or loss of hair, spooning of nails, obese, or underweight
Eyes	Normal vision and normal eye moisture	Impaired night vision or dry eyes
Mouth	Moist mucous membranes, intact oral mucosa, and intact smooth tongue	Dry/sticky mucous membranes, oral ulcerations, **glossitis (swollen tongue)**, **coughing while swallowing or inability to swallow,** or **swollen throat**
Extremities/ Integumentary	Normal skin, nontenting (good skin turgor) and supple texture	Tenting (poor skin turgor), dry skin, edema, or shiny skin
Neurological	Normal sensation and normal cognition	**Numbness or tingling, tetany,** dementia, or **acute confusion**
Cardiac	Normal heart tones, capillary refill < 3 seconds, normal pulses, and normal EKG tracing	Bounding pulses, **S3 heart tone, jugular venous distention, abnormal EKG tracing,** or **cardiac arrhythmias**
Respiratory	Clear lung sounds throughout, normal respiratory rate, and no shortness of breath	**Crackles in lung fields, pink frothy sputum, shortness of breath,** or **respiratory distress**
Gastrointestinal	Normal stool quality and frequency for the client, bowel sounds present x 4 quadrants, and absence of nausea/vomiting	Constipation, diarrhea, nausea, or vomiting
Urinary	Clear urine, normal urine specific gravity, and urine output >30 mL/hr	**Decreased urine output <30 mL/ hr or <0.5 mL/kg/hr,** concentrated urine, or **burning with urination**

Weight	Normal BMI of 18.5-24.9, weight loss or gain of 0.5 to 1 pound per week is realistic, and <5% weight loss over 6 months	BMI <18.5 or >25, **weight gain or loss of > 1kg over 24 hrs**, or severe weight loss of >10% over 6 months

Review how to perform a physical examination on the body systems listed in the previous table in Open RN *Nursing Skills, 2e*.

DIAGNOSTIC AND LAB WORK

Diagnostic and lab work results can provide important clues about a client's overall nutritional status and should be used in conjunction with a thorough subjective and objective assessment to provide an accurate picture of the client's overall health status. Common lab tests include hemoglobin (hgb), hematocrit (HCT), white blood cells (WBC), albumin, prealbumin, and transferrin.

Anemia is a medical condition diagnosed by low hemoglobin levels. Hemoglobin is important for oxygen transport throughout the body. Anemia can be caused acutely by hemorrhage, but it is often the result of chronic iron deficiency, vitamin B12 deficiency, or folate deficiency. Iron supplements, B12 injections, folate supplements, and increased iron or folate intake in the diet can help increase hemoglobin levels.

Albumin and prealbumin are proteins in the bloodstream. They maintain oncotic pressure so that fluid does not leak out of blood vessels into the extravascular space. (Read more about oncotic pressure in the "Fluids and Electrolytes" chapter.) Albumin and prealbumin levels are used as markers of malnutrition, but these levels can also be affected by medical conditions such as liver failure, kidney failure, inflammation, and zinc deficiency. Low albumin levels can indicate prolonged protein deficiency intake over several weeks, whereas prealbumin levels reflect protein intake over the previous few weeks.

For this reason, prealbumin is often used to monitor the effectiveness of parenteral nutrition therapy.[4,5]

Transferrin is a protein required for iron transport on red blood cells. Transferrin levels increase during iron deficiency anemia and decrease with renal or liver failure and infection.

A client's amount of muscle wasting due to malnutrition is measured by a 24-hour urine creatinine level.[6] If insufficient calories are consumed, the body begins to break down its own tissues in a process called catabolism. Blood urea nitrogen and creatinine are released as a by-product. A 24-hour urine collection measures these by-product levels to assess the degree of catabolism occurring.

White blood cells will decrease with malnourishment, specifically with protein and vitamins C, D, and E and B-complex deficiencies. Low white blood cell counts place the client at risk for infection because adequate white blood cells are necessary for a fully functioning immune system.

See Table 14.3b for a description of selected lab values associated with nutritional status. As always, refer to agency lab reference ranges when providing client care.

4. U.S. National Library of Medicine. (2022). *Prealbumin blood test: Medlineplus medical test*. MedlinePlus. https://medlineplus.gov/lab-tests/prealbumin-blood-test/

5. Simons, S. R., & Abdallah, L. M. (2012). Bedside assessment of enteral tube placement: Aligning practice with evidence. *American Journal of Nursing, 112*(2), 40-46. https://doi.org/10.1097/01.naj.0000411178.07179.68

6. Hood, W. A. (2020). *Nutritional status assessment in adults laboratory medicine*. Medscape. https://emedicine.medscape.com/article/2141861-labs

Table 14.3b Selected Lab Values Associated with Nutritional Status[7,8,9]

7. Hood, W. A. (2020). *Nutritional status assessment in adults laboratory medicine*. Medscape. https://emedicine.medscape.com/article/2141861-labs

8. Ignativicius, D. D., Workman, M. L., & Rebar, C. (2018). *Medical surgical nursing: Concepts for interprofessional collaborative care* (9th ed.). Elsevier.

9. University of Rochester Medical Center. (n.d.). *Health Encyclopedia*. https://www.urmc.rochester.edu/encyclopedia.aspx

Lab	Normal Range	Nursing Considerations ***Bolded items are critical conditions and require immediate health care provider notification.**
Hemoglobin (Hgb)	Females: 12 – 16 g/dLMales: 14 – 17.4 g/dL	Hemoglobin measures the oxygen-carrying capacity of blood. Decreased levels occur due to hemorrhage or deficiencies in iron, folate, or B12. 10 – 14: mild anemia **6 – 10:** moderate anemia* **Less than 6:** severe anemia*
Hematocrit (Hct)	37 – 50%	Hematocrit is normally three times the client's hemoglobin level during normal fluid status. Increased levels occur with dehydration, and decreased levels occur with fluid overload or hemorrhage.
White blood cells (WBC)	5,000 – 10,000 mm3	Increased levels occur due to infection. Decreased levels occur due to prolonged stress, poor nutrition, and vitamins C, D, and E and B-complex deficiencies. **Less than 4000: at risk for infection or sepsis** **Greater than 11,000: infection present**
Magnesium	1.6 – 2.6 mEq/L	Decreased level with poor nutrition or alcohol abuse. Increased levels due to kidney dysfunction. Critical values can cause cardiac complications such as arrhythmias or asystole: **Less than 1.2 mg/dL or greater than 4.9 mg/dL**
Albumin	3.4 – 5.4 g/dL	Increased with dehydration. Decreased level due to zinc deficiency, corticosteroid use, protein deficiency over several weeks, or conditions resulting in muscle wasting/muscle loss.
Prealbumin	15 – 36 mg/dL	Increased levels with corticosteroid or contraceptive use. Decreased levels due to inflammation, poor immunity, protein depletion over a few weeks.

Transferrin	250 – 450 mcg/dL	Increased levels due to dehydration and iron deficiency. Decreased levels due to anemia; vitamin B12, folate, and zinc deficiency; protein depletion; and conditions resulting in muscle wasting/muscle loss.
24-hour urine creatinine	Males: 0.8 – 1.8 g/24 hrs Females: 0.6 – 1.6 g/24 hrs	Increased levels with renal disease and muscle breakdown. Decreased levels with progressive malnutrition as muscles atrophy.

Various diagnostic tests may be ordered by the health care provider based on the client's medical conditions and circumstances. For example, a swallow study is a diagnostic test used for clients having difficulty swallowing. An abdominal X-ray is used to determine the correct placement of a feeding tube or to note any excess air or stool in the colon. A barium swallow is used in conjunction with a CT scan to note any blockages in the intestines.

Life Span and Cultural Considerations

Newborns and Infants

A crucial amount of growth and development happens between birth to age two. For proper growth, development, and brain function, this age group requires nutrient-dense food choices, primarily because they eat so little compared to adults, but also because of their rapid growth rate that is higher than any other time of development. Ideally, newborns through age six months should be fed exclusively human breast milk if possible, to develop immunity. Vitamin D and iron supplementation may be needed.[10] For the first

10. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

two to three days after birth, human milk contains colostrum, a thick yellowish-white fluid rich in proteins and immunoglobulin A (IgA). Colostrum is lower in carbohydrates and fat than mature breast milk. **Colostrum** helps protect the newborn from infection and builds normal intestinal bacteria. As breast milk matures after two to three days postpartum, it becomes lower in proteins and IgA and higher in carbohydrates and fat.[11] Human donor milk may be used in some situations when the mother cannot breastfeed. If human donor milk is given, it should be sourced through an accredited human milk bank and pasteurized to minimize risk of spreading infectious diseases.

There are many reasons infants may not be breastfed, including insufficient breast milk production, a personal choice not to breastfeed, or adoption of the newborn. If breastfeeding or donor milk is not an option, an iron-fortified commercial infant formula should be used exclusively through at least six months of age. Homemade or non-FDA approved infant formulas or toddler formulas should not be used because they may not meet the high nutritional needs of infants. Infants fed 100% commercial infant formula will not need vitamin D supplementation.[12]

After about six months of age, infants should begin to be introduced to additional nutrient-dense complementary foods that are developmentally appropriate. Foods should be introduced one at a time to monitor for food sensitivities. Introducing food at this time is to provide a varied diet, additional nutrients, and an introduction to different flavors and textures of food. Research shows that introduction to certain allergy-risk foods, such as peanut butter prior to one year of age, helps decrease the risk of developing a peanut allergy later in life. It is important to strictly avoid honey and other

11. Jozsa, F., & Thistle, J. (2023). *Anatomy, colostrum*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK513256/

12. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

unpasteurized food and drink before one year of age to prevent botulism and other bacteria due to immature gut immunity. Additionally, cow's milk, fortified soy drinks, and fruit or vegetable juices should not be introduced before one year of age.[13]

Children and Adolescents

Growth rate continues to be rapid from ages one through five, requiring adequate nutrition to meet these growth and metabolic demands. Caloric and nutritional intake requirements increase proportionately with age, but unfortunately, the quality of diet tends to decrease proportionately with age. This is in part due to younger children being dependent on adults for nutritional choices and intake while older children and adolescents begin to make their own food choices as they enter school. Poverty can also negatively impact nutritional intake in children and adolescents. School lunch and breakfast programs help mitigate the effects of poverty on nutrition by providing free to low-cost, nutritionally balanced meals.[14]

Healthy dietary habits formed in childhood through adolescence help prevent obesity, cardiovascular disease, diabetes mellitus, and other chronic diseases later in life. It is important to provide children with a variety of different foods prepared in different ways to increase the likelihood of children accepting and growing accustomed to different foods. It is common for children to become picky in their food choices or decide to only eat one or a few different food items over a period of time. Allowing children to help

13. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

14. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

select and prepare food can increase their acceptance of different food choices.[15]

Adults

The adult life stage is ages 19 through 59. A major limiting factor to healthy nutrition in adults is development of poor nutritional habits early in life. These unhealthy diet habits can be very difficult to change due to food preferences, as well as lack of knowledge about proper nutrition. Metabolic rate and caloric needs decrease with increasing age. Females tend to require less caloric intake than males, though caloric and nutritional needs increase with pregnancy and breastfeeding. Without appropriate dietary intake or activity, weight gain will occur that can lead to obesity and other chronic diseases. Over 50% of Americans have one or more chronic diseases that are associated with poor diet and physical inactivity.

Education regarding a healthy diet, including appropriate calorie, saturated fat, sugar, and sodium intakes, helps improve health in adults. Roughly 73% of males and 70% of females in America exceed the recommended daily intake of saturated fat, and up to 97% of males and 82% of females exceed the recommended daily intake of sodium. Approximately 97% of males and 90% of women in America do not consume the recommended intake of dietary fiber, including underconsumption of fruits, vegetables, and whole grains, which contributes to diet-related chronic diseases.

Alcohol consumption can be problematic for maintaining a healthy diet. Chronic alcohol abuse can interfere with vitamin and mineral absorption and result in general malnourishment. Alcohol should be limited to one drink per day or less for women and two drinks or less per day for men. Alcohol should be avoided by those who are pregnant, breastfeeding, younger than 21 years

15. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

old, have a chemical dependency, or have other underlying health conditions such as diabetes mellitus.[16]

Pregnancy and Lactation

A well-balanced, healthy diet is essential during pregnancy and **lactation** to prevent maternal, fetal, and newborn problems. Nutritional requirements, such as calories, vitamins, and minerals, increase during pregnancy and lactation. Increased caloric needs should be met with nutrient-dense foods rather than calorie-dense foods that are higher in fats and sugars. Prenatal vitamins and mineral supplements are often prescribed during pregnancy and lactation, in addition to a nutrient-rich diet, to help ensure women meet requirements for folic acid, iron, iodine, choline, and vitamin D. Folic acid is necessary to prevent neural tube defects in the fetus during the first trimester of pregnancy. Iron requirements increase during pregnancy to support fetal development and prevent anemia. Iodine requirements increase during pregnancy and lactation for fetal neurocognitive development. Choline requirements also increase due to the need to replace maternal stores, as well as for fetal brain and spinal cord development.[17]

Older Adults

People aged 65 years and older are considered older adults. Older adults are more likely to suffer from chronic illness and disease. Older adults have lower calorie needs than younger people, though they still need a diet full of

16. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

17. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

nutrient-dense foods because their nutrient needs increase. Caloric needs decrease due to decreased activity, decreased metabolic rates, and decreased muscle mass. Chronic disease and medication can contribute to decreased nutrient absorption. Protein and vitamin B12 are commonly under consumed in older adults. Protein is necessary to prevent loss of muscle mass. Vitamin B12 deficiency can be a problem for older adults because absorption of vitamin B12 decreases with age and with certain medications. Adequate hydration is also a concern for older adults because feelings of thirst decrease with age, leading to poor fluid intake. Additionally, older adults may be concerned with bladder dysfunction so they may consciously choose to limit fluid intake. Loneliness, ability to chew and swallow, and poverty can also decrease dietary intake in older adults.[18] Meals on Wheels, local senior centers, and other community programs can provide socialization and well-balanced meals to older adults.

The Mini-Nutritional Assessment Short-Form is a screening tool used to identify older adults who are malnourished or at risk of malnutrition. Use the following box to download this tool.

> Download the Mini-Nutritional Assessment Short-Form from The Hartford Institute for Geriatric Nursing.[19]

18. U.S. Department of Agriculture and U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020-2025* (9th ed.). https://www.dietaryguidelines.gov/

19. The Hartford Institute for Geriatric Nursing, New York University, Rory Meyers School of Nursing. (n.d.). *Assessment tools for best practices of care for older adults*. https://hign.org/consultgeri-resources/try-this-series

Diagnosis

After the assessment stage is conducted, data is analyzed, and pertinent information is clustered together, nursing diagnoses are selected based on defining characteristics. When creating a care plan for a client, review a current nursing care planning source for current NANDA-I approved nursing diagnoses and interventions related to nutritional imbalances. Examples of NANDA-I nursing diagnoses related to nutrition include *Imbalanced Nutrition: Less than Body Requirements*, *Overweight, Obesity, Risk for Overweight, Readiness for Enhanced Nutrition,* and *Impaired Swallowing*.[20] See Table 14.3c for additional information related to the diagnosis *Imbalanced Nutrition: Less than Body Requirements*.

Table 14.3c Sample NANDA-I Nursing Diagnosis Related to Nutrition[21]

20. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

21. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

NANDA-I Diagnosis	Definition	Selected Defining Characteristics
Imbalanced Nutrition: Less than Body Requirements	Intake of nutrients insufficient to meet metabolic needs.	Abdominal cramping Abdominal pain Body weight below ideal weight range for age and gender Diarrhea Food intake less than recommended daily allowance (RDA) Hyperactive bowel sounds Lethargy Pale mucous membranes Weight loss with adequate food intake

A sample nursing diagnosis written in PES format is, "*Imbalanced Nutrition: Less than Body Requirements related to insufficient dietary intake as evidenced by body weight 20% below ideal weight range and food intake less than recommended daily allowance*."

Outcome Identification

Goals for clients experiencing altered nutritional status depend on the selected nursing diagnosis and specific client situation. Typically, goals relate to resolution of the nutritional imbalance and are broad in nature. An overall goal related to nutritional imbalances is, "*The client will weigh within normal range for their height and age*."[22]

Outcome criteria are specific, measurable, achievable, realistic, and time-

22. Ackley, B., Ladwig, G., Makic, M.B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 651-657.

oriented. A sample SMART goal is, "*The client will select three dietary modifications to meet their long-term health goals using USDA MyPlate guidelines by discharge*."[23]

Planning Interventions

After SMART outcome criteria are customized to the client's situation, nursing interventions are selected to help them achieve their identified outcomes. Interventions are specific to the alteration in nutritional status and should accommodate the client's cultural and religious beliefs. The box below outlines selected interventions related to nutrition therapy.

Nutrition Therapy[24]

- Identify nutritional risks
- Monitor food/fluid ingested and calculate daily caloric intake, as appropriate
- Monitor appropriateness of prescribed diet to meet daily nutritional needs, as appropriate
- Initiate prescribed number of calories and types of nutrients needed to meet requirements, as appropriate
- Determine food preferences with consideration of the client's cultural and religious preferences
- Offer nutritional supplements, as appropriate

23. Ackley, B., Ladwig, G., Makic, M.B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 651-657.

24. Wagner, C. M., Butcher, H. K., & Clarke, M. F. (2024). *Nursing interventions classification (NIC)* (8th ed.). Elsevier.

- Offer mealtime assistance to support dietary intake, as appropriate
- Determine need for enteral tube or parenteral feedings
- Manage enteral feeding or parenteral nutrition, as indicated
- Structure the environment to create a pleasant and relaxing meal atmosphere
- Present food in an attractive, pleasing manner, giving consideration to color, texture, and variety
- Encourage the client to share mealtimes with others, as appropriate
- Encourage adequate dental and mouth care
- Assist the client to a sitting position before eating or feeding
- Monitor laboratory values, as appropriate
- Instruct the client and family about nutritional information and prescribed diets
- Refer for diet teaching and planning, as appropriate
- Provide written examples of prescribed diet
- Check medications and alter where possible to minimize adverse effects
- Encourage physical activity to maintain or improve muscle mass and function

Clients may be prescribed special diets due to medical conditions or altered nutrition states. See Table 14.3d for commonly prescribed special diets.

Table 14.3d Commonly Prescribed Special Diets

Diet	Description	Example	Indication
NPO	Nothing by mouth–no food or drink allowed *Note: Oral care is very important during NPO status.	Oral care only	Before and after surgery or procedures, when peristalsis is absent, or during severe nausea or vomiting episodes, or for changes in mental status
Clear liquids	Fluids or solids that are liquid at room temperature, without residue, clear, or see-through	Water, apple juice, clear soda, Jello, popsicles, and broth	After surgery when peristalsis is slow and diet is being advanced from NPO status
Full liquids	Fluids with residue	Creamed soups, pudding, milk, orange juice, and creamed cereals	Next step after clear liquids as diet is being advanced
Mechanical soft	Chopped, ground, pureed foods that break apart easily without a knife	Soft cheeses, cottage cheese, ground meat, broiled or baked fish, cooked vegetables, and fruit	Poor or absent dentition; dysphagia
Pureed	Spoon thick with consistency of baby food	Applesauce, pudding, mashed potatoes, pureed meats, vegetables, and fruit	Dysphagia
Restrictive	Depends on the disease process	Diabetic: controlled amount of carbohydrates Cardiac: low fat and no added salt Renal: low-sodium and low-potassium containing foods	Diabetes mellitus Heart disease Renal failure or dialysis

“Thickened liquids” are typically prescribed for clients with difficulty

swallowing (dysphagia). Three consistencies of thickened liquids are as follows:

- Nectar-thick liquids: Easily pourable liquid comparable to apricot nectar or thick cream soups.
- Honey-thick liquids: Slightly thicker liquid that is less pourable and drizzles from a cup or bowl.
- Pudding-thick liquids: Liquids that hold their own shape. They are not pourable and usually require a spoon to eat.

Nurses often thicken liquids in the client's room using a commercial thickener. Most commercial thickeners include directions for achieving the consistency prescribed.

Enteral Nutrition

Enteral nutrition is administered directly to a client's gastrointestinal tract while bypassing chewing and swallowing. Enteral feedings are prescribed for clients when chewing and/or swallowing are impaired or when there is poor nutritional intake and/or malnutrition.

Examples of enteral tube access are nasogastric tubes (NG), orogastric tubes (OG), percutaneous endoscopic gastrostomy (PEG) tubes, or percutaneous endoscopic jejunostomy (PEJ) tubes. See Figure 14.12[25] for an illustration of common enteral tube placement. Nasogastric tubes enter the nare and travel through the esophagus and into the stomach. Liquid tube feedings are infused through this tube and directly into the stomach. Orogastric tubes work in the same manner except they are inserted through the mouth into the esophagus and then into the stomach. Orogastric tubes are typically used with mechanically intubated and sedated clients and should never be used in conscious clients because they can induce a gag

25. "Types and Placement of Enteral Tubes" by Meredith Pomietlo for Chippewa Valley Technical College is licensed under CC BY 4.0

reflex and cause vomiting. PEG tubes are inserted through the abdominal wall directly into the stomach, bypassing the esophagus. PEG tubes are used when there is an obstruction to the esophagus, the esophagus has been removed, or if long-term enteral feedings are expected. PEJ tubes are inserted through the abdominal wall directly into the jejunum, bypassing the esophagus and stomach. PEJ tubes are used when all or part of the stomach has been removed or if the provider determines PEJ placement would best suit the client's needs.

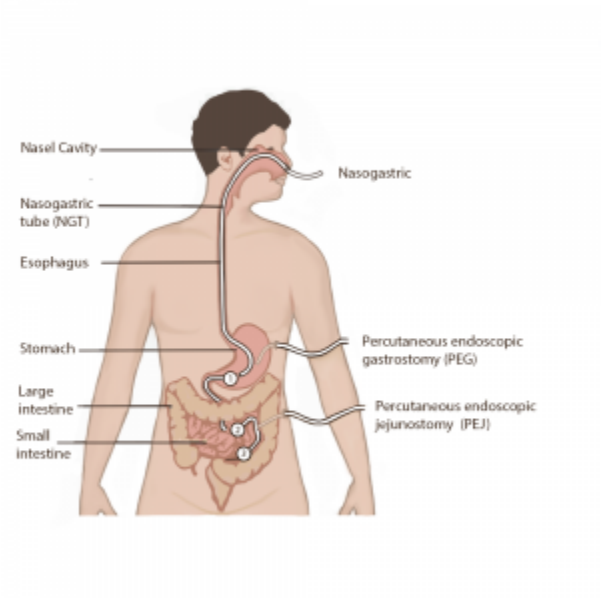

Figure 14.12 Enteral Tube Access

There are several safety considerations for nurses to implement when enteral nutrition is being administered to prevent aspiration and dehydration. Tube placement must be verified after insertion, as well as before every medication or feeding is administered, to prevent inadvertent administration into the lungs if the tube has migrated out of position. Follow agency policy regarding checking placement. The American Association of Critical-Care Nursing recommends that the position of a feeding tube should be checked and documented every four hours and prior to the administration of enteral feedings and medications by measuring the visible tube length and comparing it to the length documented during X-ray verification. Older methods of checking tube placement included observing aspirated GI

contents or the administration of air with a syringe while auscultating (commonly referred to as the “whoosh test”). However, research has determined these methods are unreliable and should no longer be used to verify placement.[26,27]

In addition to verifying tube placement before administering feedings or medications, nurses perform additional interventions to prevent aspiration. The American Association of Critical-Care Nurses recommends the following guidelines to reduce the risk for aspiration:

- Maintain the head of the bed at 30°- 45° unless contraindicated
- Use sedatives as sparingly as possible
- Assess feeding tube placement at four-hour intervals
- Observe for change in the amount of external length of the tube
- Assess for gastrointestinal intolerance at four-hour intervals[28,29]

26. Simons, S. R., & Abdallah, L. M. (2012). Bedside assessment of enteral tube placement: Aligning practice with evidence. *American Journal of Nursing, 112*(2), 40-46. https://doi.org/10.1097/01.naj.0000411178.07179.68

27. Boullata, J. I., Carrera, A. L., Harvey, L., Escuro, A. A., Hudson, L., Mays, A., McGinnis, C., Wessel, J. J., Bajpai, S., Beebe, M. L., Kinn, T. J., Klang, M. G., Lord, L., Martin, K., Pompeii-Wolfe, C., Sullivan, J., Wood, A., Malone, A., & Guenter, P. (2017). ASPEN safe practices for enteral nutrition therapy. *Journal of Parenteral and Enteral Nutrition, 41*(1), 15-103. https://doi.org/10.1177/0148607116673053

28. Simons, S. R., & Abdallah, L. M. (2012). Bedside assessment of enteral tube placement: Aligning practice with evidence. *American Journal of Nursing, 112*(2), 40-46. https://doi.org/10.1097/01.naj.0000411178.07179.68

29. Boullata, J. I., Carrera, A. L., Harvey, L., Escuro, A. A., Hudson, L., Mays, A., McGinnis, C., Wessel, J. J., Bajpai, S., Beebe, M. L., Kinn, T. J., Klang, M. G., Lord, L., Martin, K., Pompeii-Wolfe, C., Sullivan, J., Wood, A., Malone, A., & Guenter, P. (2017). ASPEN safe practices for enteral nutrition therapy. *Journal of*

Measurement of gastric residual volume (GRV) is often performed when a client is receiving enteral feeding by using a 60-mL syringe to aspirate stomach contents through the tube. GRVs in the range of 200–500 mL have traditionally triggered nursing interventions, such as slowing or stopping the feeding, to reduce the client's risk of aspiration. However, according to recent research, it is not appropriate to stop enteral nutrition for GRVs less than 500 mL in the absence of other signs of intolerance because of the impact on the client's overall nutritional status. Additionally, the aspiration of gastric residual volumes can contribute to tube clogging. Follow agency policy regarding measuring gastric residual volume and implementing interventions to prevent aspiration.[30,31]

Clients receiving enteral nutrition should be monitored daily for signs of tube feeding intolerance, such as abdominal bloating, nausea, vomiting, diarrhea, cramping, and constipation. If cramping occurs during bolus feedings, it can be helpful to administer the enteral nutritional formula at room temperature to prevent symptoms. Notify the provider of signs of intolerance with anticipated prescription changes regarding the type of formula or the rate of administration.

Electrolytes and blood glucose levels should also be monitored for signs of imbalances. Carbohydrates in tube feedings are absorbed quickly, so blood

Parenteral and Enteral Nutrition, 41(1), 15-103. https://doi.org/10.1177/0148607116673053

30. Simons, S. R., & Abdallah, L. M. (2012). Bedside assessment of enteral tube placement: Aligning practice with evidence. *American Journal of Nursing, 112*(2), 40-46. https://doi.org/10.1097/01.naj.0000411178.07179.68

31. Boullata, J. I., Carrera, A. L., Harvey, L., Escuro, A. A., Hudson, L., Mays, A., McGinnis, C., Wessel, J. J., Bajpai, S., Beebe, M. L., Kinn, T. J., Klang, M. G., Lord, L., Martin, K., Pompeii-Wolfe, C., Sullivan, J., Wood, A., Malone, A., & Guenter, P. (2017). ASPEN safe practices for enteral nutrition therapy. *Journal of Parenteral and Enteral Nutrition, 41*(1), 15-103. https://doi.org/10.1177/0148607116673053

glucose levels are monitored, and elevated levels are typically treated with sliding scale insulin according to health care provider orders.

> Read about "Enteral Tube Management" in Open RN *Nursing Skills, 2e*.

Parenteral Nutrition

Parenteral nutrition is nutrition delivered through a central intravenous line, generally the subclavian or internal jugular vein, to clients who require nutritional supplementation but are not candidates for enteral nutrition. Parenteral nutrition is an intravenous solution containing glucose, amino acids, minerals, electrolytes, and vitamins. A lipid solution is typically given in a separate infusion in a hospital setting. This combination of solutions is called total parenteral nutrition because it supplies complete nutritional support. Parenteral nutrition is administered via an IV pump.

Because parenteral nutrition consists of concentrated glucose, amino acids, and minerals, it is very irritating to the blood vessels. For this reason, a large central vein must be used for administration. The client's lab work must also be closely monitored for signs of nutrient excesses. See Figure 14.13[32] for an image of home parenteral nutrition formula. In this image are three compartments: one with glucose, one with amino acids, and one with lipids. The three compartments are kept separate to enable storage at room temperature but are mixed together before use.

Parenteral nutrition is typically used when the client's intestines or stomach is not working properly and must be bypassed, such as during paralytic ileus where peristalsis has completely stopped, or after postoperative bowel

32. "Tpn_3bag.jpg" by Tristanb in English Wikipedia is licensed under CC BY-SA 3.0

surgeries, such as bowel resection. It may also be prescribed for severe malnutrition, severe burns, metastatic cancer, liver failure, or hyperemesis with pregnancy.

Figure 14.13 Total Parenteral Nutrition

Implementing Interventions

When implementing interventions to promote good nutrition, it is vital to consider the client's cultural and religious beliefs. Encourage clients to make healthy food selections based on their food preferences.

If a client has nutritional deficit, perform nursing interventions prior to mealtime to promote their appetite. For example, if the client has symptoms of pain or nausea, administer medications prior to mealtime to manage these symptoms. Do not perform procedures that may affect the client's appetite, such as wound dressing changes, immediately prior to mealtime. Manage the environment prior to the food arriving and remove any unpleasant odors or sights. For example, empty the trash can of used dressings or incontinence products. If the client is out of the room when the meal tray arrives and the food becomes cold, reheat the food or order a new meal tray.

When assisting clients to eat, help them to wash their hands and use the

restroom if needed. Assist them to sit in a chair or sit in high Fowler's position in bed. Set the meal tray on an overbed table and open containers as needed. Encourage the client to feed themselves as much as possible to promote independence. If a client has vision impairments, explain the location of the food using the clock method. For example, "Your vegetables are at 9 o'clock, your potatoes are at 12 o'clock, and your meat is at 3 o'clock." When feeding a client, ask them what food they would like to eat first. Allow them to eat at their own pace with time between bites for thorough chewing and swallowing. If any signs of difficulty swallowing occur, such as coughing or gagging, stop the meal and notify the provider of suspected swallowing difficulties.

Evaluation

It is always important to evaluate the effectiveness of interventions implemented. Evaluation helps the nurse and care team determine if the interventions are appropriate for the client or if they need to be revised. Table 14.3e provides a list of assessment findings indicating that alterations of nutritional status are improving with the planned interventions.

Table 14.3e Evaluation of Alterations in Nutritional Status

Imbalance	How Do We Know It Is Improved?
Imbalanced Nutrition: Less than Body Requirements	Stable or increasing weight; sufficient daily calories; well-balanced meal intake; improved energy, appearance of hair, nails, skin, or vision
Imbalanced Nutrition: More than Body Requirements	Stable or decreasing weight, <5% body weight loss over six months, well-balanced meal intake

14.4 Putting It All Together

Client Scenario

Mr. Curtis is a 47-year-old client admitted to the hospital with increased weakness, fatigue, and dehydration. His skin appears dry, and tenting occurs when skin turgor is evaluated. He is currently undergoing chemotherapy treatment for multiple myeloma and has experienced weight loss of ten pounds within the last two weeks. He describes that "nothing tastes good," and he feels as if there is "a metal taste in his mouth." When he does eat small meals, he reports that he is often nauseous. The client's serum albumin level is 3.1 g/dL.

Applying the Nursing Process

Assessment: The nurse identifies that the client is experiencing signs of imbalanced nutrition with the signs of increased weakness, fatigue, and signs of dehydration such as skin tenting and dryness. The client has demonstrated a significant weight loss over the past two weeks and reports "nothing tastes good" and "a metal taste in the mouth." The client also reports nausea after eating. His serum albumin level reflects signs of malnutrition.

Based on the assessment information that has been gathered, the following nursing care plan is created for Mr. Curtis:

Nursing Diagnosis: *Imbalanced Nutrition: Less Than Body Requirements r/t insufficient dietary intake as manifested by weight loss of 10 pounds in the last two weeks, skin tenting and dryness, reports of "nothing tastes good," and serum albumin of 3.1 g/dL*.

Overall Goal: *The client will demonstrate improvement in nutrition intake*.

SMART Expected Outcome: *Mr. Curtis will eat 50% of offered meals and demonstrate dietary tolerance within 24 hours*.

Planning and Implementing Nursing Interventions:

The nurse will validate the client's feelings regarding his current symptoms and provide emotional support. The nurse will determine the time of day

when the client's appetite is highest and offer the highest calorie meal at that time. The nurse will offer high-calorie protein shakes to the client at frequent intervals. The nurse will assess the client's food preferences and ensure that small frequent meals are offered that incorporate those preferences. The nurse will also encourage the use of plastic utensils and encourage the client to eat mints or chew gum to minimize the metallic taste in the mouth.

Sample Documentation:

Mr. Curtis demonstrates signs of Imbalanced Nutrition: Less Than Body Requirements. He reported a significant weight loss of ten pounds over the past two weeks associated with chemotherapy. He reports feeling nauseous following small meals. He also reports "nothing tastes good" and having "a metal taste in the mouth." He demonstrates signs of weakness, fatigue, and dehydration. Interventions have been implemented to increase the client's nutritional intake.

Evaluation:

Twenty-four hours later, the nurse evaluates Mr. Curtis and finds he is able to consume 50% of breakfast with his preferred dietary items. Planned interventions will continue and the nurse plans to reevaluate his progress the following day.

14.5 Learning Activities

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Activities

(Answers to "Learning Activities" can be found in the "Answer Key" at the end of the book. Answers to interactive activity elements will be provided within the element as immediate feedback.)

Scenario 1

Mr. Jones is a 67-year-old client on the medical-surgical floor who recently underwent a colon resection. See Figure 14.14 for an image of Mr. Jones.[1] He is post-op Day 2 and has been NPO since surgery. He has been receiving IV fluids but has been asking about when he can resume eating.

1. "Simulated Patient Clint Fullerton" by Open RN is licensed under CC BY 4.0

Figure 14.14 Mr. Jones

Questions:

1. What assessments should be performed to determine if the client's diet can be progressed?
2. What are the first steps during dietary transition from NPO status?

Scenario 2

Mrs. Casey is a 78-year-old widow who recently had a stroke and continues to experience mild right-sided weakness. See Figure 14.15 for an image of Mrs. Casey.[2] She is currently receiving physical therapy in a long-term care facility and ambulates with the assistance of a walker. Mrs. Casey confides, "I am looking forward to going home, but I will miss the three meals a day here."

Her height is 5'2" and she weighs 84 pounds. Her recent lab work

2. "woman-1031000_960_720.jpg" by Free-Photos is licensed under CC0

results include the following results: Hgb: 8.8 g/dL, WBC 3500, Magnesium 1.4 mg/dL, Albumin 1.0 g/dL

Figure 14.15 Mrs. Casey

Questions:

1. What is Mrs. Casey's BMI and what does this number indicate?
2. Analyze Mrs. Casey's recent lab work and interpret the findings.
3. Describe focused assessments the nurse should perform regarding Mrs. Casey's nutritional status.
4. Create a PES nursing diagnosis statement for Mrs. Casey based on her nutritional status.
5. Create a SMART outcome statement for Mrs. Casey.
6. Outline planned nutritional interventions for Mrs. Casey while she is at the facility, as well as when she returns home.
7. How will you evaluate if your nursing care plan is successful for Mrs. Casey?

An interactive H5P element has been excluded from this version of the text. You can view it online

here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=2076#h5p-70

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=2076#h5p-48

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=2076#h5p-50

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=2076#h5p-92

Test your knowledge using this NCLEX Next Generation-style bowtie question. You may reset and resubmit your answers to this question an unlimited number of times.[3]

3. "Chapter 14 Assignment 1" by Tami Davis for OpenRN is licensed under CC BY-NC 4.0

XIV Glossary

OPEN RESOURCES FOR NURSING (OPEN RN)

Body Mass Index (BMI): A measure of weight categories including underweight, normal weight, overweight, and obese taking height and weight into consideration. (Chapter 14.3)

Calorie-dense foods: Foods with a substantial amount of calories and few nutrients. (Chapter 14.2)

Carbohydrates: Sugars and starches that provide an important energy source, providing 4 kcal/g of energy. (Chapter 14.2)

Chemical digestion: Breakdown of food with stomach acids, bile, and pancreatic enzymes for nutrient release. (Chapter 14.2)

Colostrum: A thick yellowish-white fluid rich in proteins and immunoglobulin A (IgA) and lower in carbohydrates and fat than mature breast milk secreted within the first 2-3 days after giving birth. (Chapter 14.3)

Complete proteins: Proteins with enough amino acids in enough quantities to perform necessary functions such as growth and tissue maintenance. These must be ingested in the diet. (Chapter 14.2)

Complex carbohydrates: Larger molecules of polysaccharides that break down more slowly and release sugar into the bloodstream more slowly than simple carbohydrates. (Chapter 14.2)

Dietary Reference Intakes (DRIs): Set requirements or limit amounts of a certain nutrient, including proteins, carbohydrates, fats, vitamins, minerals, and fiber. (Chapter 14.2)

Dysphagia: Difficulty swallowing. (Chapter 14.2)

Enteral nutrition: Liquid nutrition given through the gastrointestinal tract via a tube while bypassing chewing and swallowing. (Chapter 14.3)

Essential nutrients: Nutrients that must be ingested from dietary intake. Essential nutrients cannot be synthesized by the body. (Chapter 14.2)

Fat-soluble vitamins: Vitamins that dissolve in fats and oils and are stored in fat tissue and can build up in the liver, resulting in toxicity. Fat-soluble vitamins include vitamins A, D, E, and K. (Chapter 14.2)

Fats: Fatty acids and glycerol that are essential for tissue growth, insulation, energy source, energy storage, and hormone production. Fats provide 9 kcal/g of energy. (Chapter 14.2)

Glycemic index: A measure of how quickly glucose levels increase in the bloodstream after carbohydrates are consumed. (Chapter 14.2)

Incomplete proteins: Proteins that do not contain enough amino acids to sustain life. Incomplete proteins can be combined with other types of proteins to add to amino acids consumed to form complete protein combinations. (Chapter 14.2)

Lactation: Breast milk production. (Chapter 14.3)

Macrominerals: Minerals needed in larger amounts and measured in milligrams, grams, and milliequivalents. (Chapter 14.2)

Macronutrients: Nutrients needed in larger amounts due to energy needs. Macronutrients include carbohydrates, proteins, and fats. (Chapter 14.2)

Mastication: The chewing of food in the mouth. (Chapter 14.2)

Mechanical digestion: Breaking food down into small chunks through chewing prior to swallowing. (Chapter 14.2)

Nitrogen balance: The net loss or gain of nitrogen excreted compared to nitrogen taken into the body in the form of protein consumption; an indicator of protein status where a negative nitrogen balance equates to a protein deficit in the diet and a positive nitrogen balance equates to a protein excess in the diet. (Chapter 14.2)

Nutrient-dense foods: Foods with a high proportion of nutritional value relative to calories contained in the food. (Chapter 14.2)

Parenteral nutrition: An intravenous solution containing glucose, amino acids, minerals, electrolytes, and vitamins, along with supplemental lipids. (Chapter 14.3)

Partially complete proteins: Proteins that have enough amino acids to sustain life, but not enough for tissue growth and maintenance. Typically interchanged with incomplete proteins. (Chapter 14.2)

Peristalsis: Coordinated muscle movements in the esophagus that move food or liquid through the esophagus and into the stomach or coordinated muscle movements in the intestines that move food/waste products through the intestines. (Chapter 14.2)

Proteins: Peptides and amino acids that provide 4 kcal/g of energy. Proteins are necessary for tissue repair and function, growth, energy, fluid balance, clotting, and the production of white blood cells. (Chapter 14.2)

Refined grains: Grains that have been processed to remove parts of the grain kernel and supply little fiber. (Chapter 14.2)

Saturated fats: Fats derived from animal products, such as butter, tallow, and lard for cooking, or from meat products such as steak. Saturated fats are generally solid at room temperature and can raise cholesterol levels, contributing to heart disease. (Chapter 14.2)

Simple carbohydrates: Small molecules of monosaccharides or disaccharides that break down quickly and raise blood glucose levels quickly. (Chapter 14.2)

Trace minerals: Minerals needed in tiny amounts. (Chapter 14.2)

Trans fats: Fats that have been altered through hydrogenation and as such are not in their natural state. Fat is changed to make it harder at room temperature and to make it have a longer shelf life and contributes to increased cholesterol and heart disease. (Chapter 14.2)

Unsaturated fats: Fats derived from oils and plants, though chicken and fish contain some unsaturated fats as well. Unsaturated fats are healthier than saturated fats, and some containing omega-3 fatty acids are considered polyunsaturated fats and help lower LDL cholesterol levels. (Chapter 14.2)

Water-soluble vitamins: Vitamins that are not stored in the body and include vitamin C and B-complex vitamins: B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), B12 (cyanocobalamin), and B9 (folic acid, biotin, and pantothenic acid). Toxicity is rare as excess water-soluble vitamins are excreted in the urine. (Chapter 14.2)

Whole grains: Grains with the entire grain kernel that supply more fiber than refined grains. (Chapter 14.2)

PART XV

FLUIDS AND ELECTROLYTES

15.1 Fluids and Electrolytes Introduction

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Objectives

- Describe risk factors for fluid and electrolyte disturbances
- Identify cues related to fluid/electrolyte balance
- Identify diagnostic tests and lab values indicative of a disturbance in fluid and electrolyte disturbances
- Identify essential nutrients
- Identify supplements to enhance nutrition alterations
- Contribute to a plan of care for clients with an alteration in nutrition and fluid and electrolyte disturbances

The human body maintains a delicate balance of fluids and electrolytes to help ensure proper functioning and homeostasis. When fluids or electrolytes become imbalanced, individuals are at risk for organ system dysfunction. If an imbalance goes undetected and is left untreated, organ systems cannot function properly and ultimately death will occur. Nurses must be able to recognize subtle changes in fluid or electrolyte balances in their clients so they can intervene promptly. Timely assessment and intervention prevent complications and save lives.

15.2 Basic Fluid and Electrolyte Concepts

OPEN RESOURCES FOR NURSING (OPEN RN)

Before learning about how to care for clients with fluid and electrolyte imbalances, it is important to understand the physiological processes of the body's regulatory mechanisms. The body is in a constant state of change as fluids and electrolytes are shifted in and out of cells within the body in an attempt to maintain a nearly perfect balance. A slight change in either direction can have significant consequences on various body systems.

Body Fluids

Body fluids consist of water, electrolytes, blood plasma and component cells, proteins, and other soluble particles called solutes. Body fluids are found in two main areas of the body called intracellular and extracellular compartments. See Figure 15.1[1] for an illustration of intracellular and extracellular compartments.

1. "Cellular_Fluid_Content.jpg" by Welcome1To1The1Jungle is licensed under CC BY 3.0

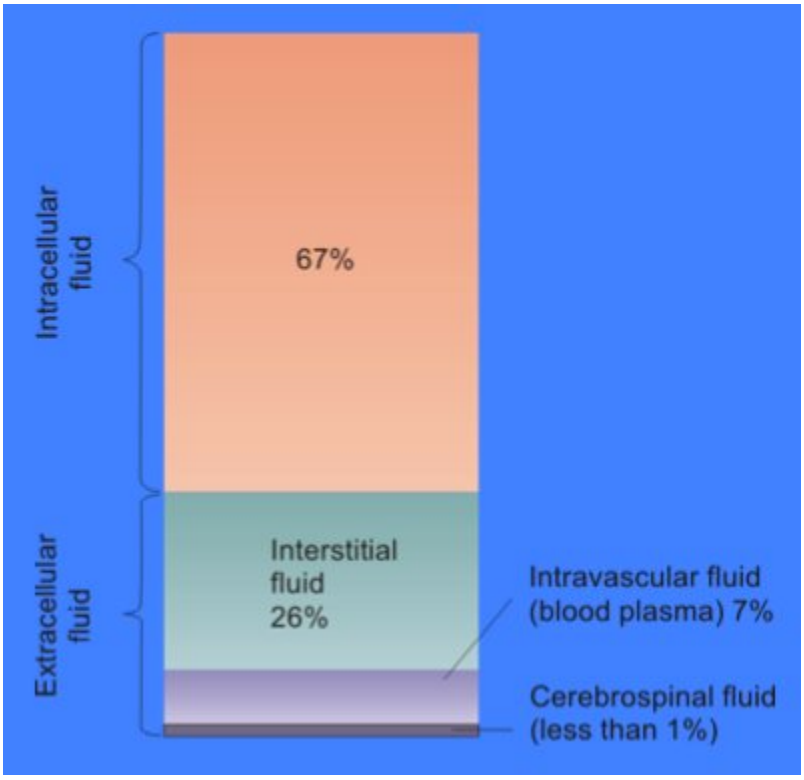

Figure 15.1 Intracellular and Extracellular Compartments

Intracellular fluids (ICF) are found inside cells and are made up of protein, water, electrolytes, and solutes. The most abundant electrolyte in intracellular fluid is potassium. Intracellular fluids are crucial to the body's functioning. In fact, intracellular fluid accounts for 60% of the volume of body fluids and 40% of a person's total body weight![2]

Extracellular fluids (ECF) are fluids found outside of cells. The most abundant electrolyte in extracellular fluid is sodium. The body regulates sodium levels to control the movement of water into and out of the extracellular space due to osmosis.

Extracellular fluids can be further broken down into various types. The first type is known as intravascular fluid found in the vascular system and consists

2. Encyclopædia Britannica, inc. (n.d.). *Fluid*. Encyclopædia Britannica. https://www.britannica.com/science/fluid-biology

of arteries, veins, and capillary networks. **Intravascular fluid** is whole blood volume and includes red blood cells, white blood cells, plasma, and platelets. Intravascular fluid is the most important component of the body's overall fluid balance.

Loss of intravascular fluids causes the nursing diagnosis *Deficient Fluid Volume*, also referred to as **hypovolemia**. Intravascular fluid loss can be caused by several factors, such as excessive diuretic use, severe bleeding, vomiting, diarrhea, and inadequate oral fluid intake. If intravascular fluid loss is severe, the body cannot maintain adequate blood pressure and perfusion of vital organs. This can result in hypovolemic shock and cellular death when critical organs do not receive an oxygen-rich blood supply needed to perform cellular function.

A second type of extracellular fluid is interstitial fluid. **Interstitial fluid** refers to fluid outside of blood vessels and between the cells. For example, if you have ever cared for a client with heart failure and noticed increased swelling in the feet and ankles, you have seen an example of excess interstitial fluid referred to as **edema**.

The remaining extracellular fluid, also called **transcellular fluid**, refers to fluid in areas such as cerebrospinal, synovial, intrapleural, and the gastrointestinal system.[3]

Fluid Movement

Fluid movement occurs inside the body due to osmotic pressure, hydrostatic pressure, and osmosis. Proper fluid movement depends on intact and properly functioning vascular tissue lining, normal levels of protein content within the blood, and adequate hydrostatic pressures inside the blood vessels. Intact vascular tissue lining prevents fluid from leaking out of the blood vessels. Protein content of the blood (in the form of albumin) causes **oncotic pressure** that holds water inside the vascular compartment. For example, clients with decreased protein levels (i.e., low serum albumin) experience

3. Brinkman, J. E. (2023). *Physiology, body fluids*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK482447/

edema due to the leakage of intravascular fluid into interstitial areas because of decreased oncotic pressure.

Hydrostatic pressure is defined as pressure that a contained fluid exerts on what is confining it. In the intravascular fluid compartment, hydrostatic pressure is the pressure exerted by blood against the capillaries. Hydrostatic pressure opposes oncotic pressure at the arterial end of capillaries, where it pushes fluid and solutes out into the interstitial compartment. On the venous end of the capillary, hydrostatic pressure is reduced, which allows oncotic pressure to pull fluids and solutes back into the capillary.[4,5] See Figure 15.2[6] for an illustration of hydrostatic pressure and oncotic pressure in a capillary.

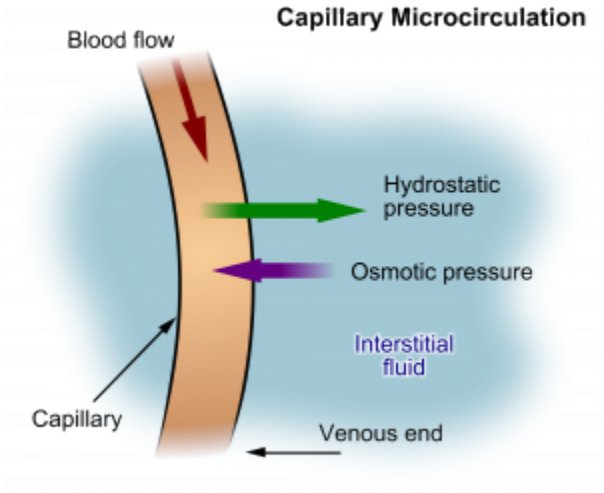

Figure 15.2 Hydrostatic Pressure

Filtration occurs when hydrostatic pressure pushes fluids and solutes through a permeable membrane so they can be excreted. An example of this

4. Brinkman, J. E. (2023). *Physiology, body fluids*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK482447/

5. "Hydrostatic Pressure" by Ann Lawrie is licensed under CC BY-NC 2.0

6. "Capillary_microcirculation.jpg" by Kes47 is in the Public Domain

process is fluid and waste filtration through the glomerular capillaries in the kidneys. This filtration process within the kidneys allows excess fluid and waste products to be excreted from the body in the form of urine.

Fluid movement is also controlled through osmosis. **Osmosis** is water movement through a semipermeable membrane, from an area of lesser solute concentration to an area of greater solute concentration, in an attempt to equalize the solute concentrations on either side of the membrane. Only fluids and some particles dissolved in the fluid are able to pass through a semipermeable membrane; larger particles are blocked from getting through. Because osmosis causes fluid to travel due to a concentration gradient and no energy is expended during the process, it is referred to as **passive transport**.[7] See Figure 15.3[8] for an illustration of osmosis where water has moved to the right side of the membrane to equalize the concentration of solutes on that side with the left side.

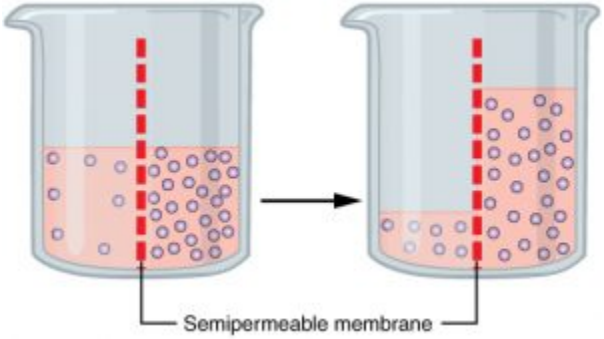

Figure 15.3 Osmosis

7. BBC. (2023). *Cells – cells and movement across membranes – WJEC*. BBC Bitesize. https://www.bbc.co.uk/bitesize/guides/zsgfv4j/revision/1

8. "0307_Osmosis.jpg" by OpenStax is licensed under CC BY 4.0. Access for free at https://openstax.org/books/anatomy-and-physiology/pages/3-1-the-cell-membrane

Osmosis causes fluid movement between the intravascular, interstitial, and intracellular fluid compartments based on solute concentration. For example, recall a time when you have eaten a large amount of salty foods. The sodium concentration of the blood becomes elevated. Due to the elevated solute concentration within the bloodstream, osmosis causes fluid to be pulled into the intravascular compartment from the interstitial and intracellular compartments to try to equalize the solute concentration. As fluid leaves the cells, they shrink in size. The shrinkage of cells is what causes many symptoms of dehydration, such as dry, sticky mucous membranes. Because the brain cells are especially susceptible to fluid movement due to osmosis, a headache may occur if adequate fluid intake does not occur.

Solute Movement

Solute movement is controlled by diffusion, active transport, and filtration. **Diffusion** is the movement of molecules from an area of higher concentration to an area of lower concentration to equalize the concentration of solutes throughout an area. (Note that diffusion is different from osmosis because osmosis is the movement of fluid whereas diffusion is the movement of solutes.) See Figure 15.4[9] for an image of diffusion. Because diffusion travels down a concentration gradient, the solutes move freely without energy expenditure. An example of diffusion is the movement of inhaled oxygen molecules from alveoli to the capillaries in the lungs so that they can be distributed throughout the body.

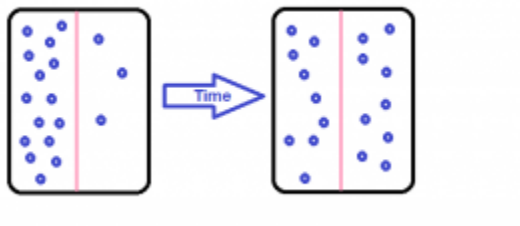

Figure 15.4 Diffusion

9. "Simple_Diffusion.png" by Elizabeth2424 is licensed under CC BY-SA 3.0

Active transport, unlike diffusion, involves moving solutes and ions across a cell membrane from an area of lower concentration to an area of higher concentration. Because active transport moves solutes against a concentration gradient to prevent an overaccumulation of solutes in an area, energy is required for this process to take place.[10] An example of active transport is the sodium-potassium pump, which uses energy to maintain higher levels of sodium in the extracellular fluid and higher levels of potassium in the intracellular fluid. See Figure 15.5[11] for an image of diffusion and the sodium-potassium pump regulating sodium and potassium levels in the extracellular and intracellular compartments. Recall that sodium (Na^+) is the primary electrolyte in the extracellular space and potassium (K^+) is the primary electrolyte in the intracellular space.

10. BBC. (2023). *Cells – cells and movement across membranes – WJEC*. BBC Bitesize. https://www.bbc.co.uk/bitesize/guides/zsgfv4j/revision/1

11. "Sodium-potassium_pump_and_diffusion.png" by BruceBlaus.com staff is licensed under CC BY 3.0

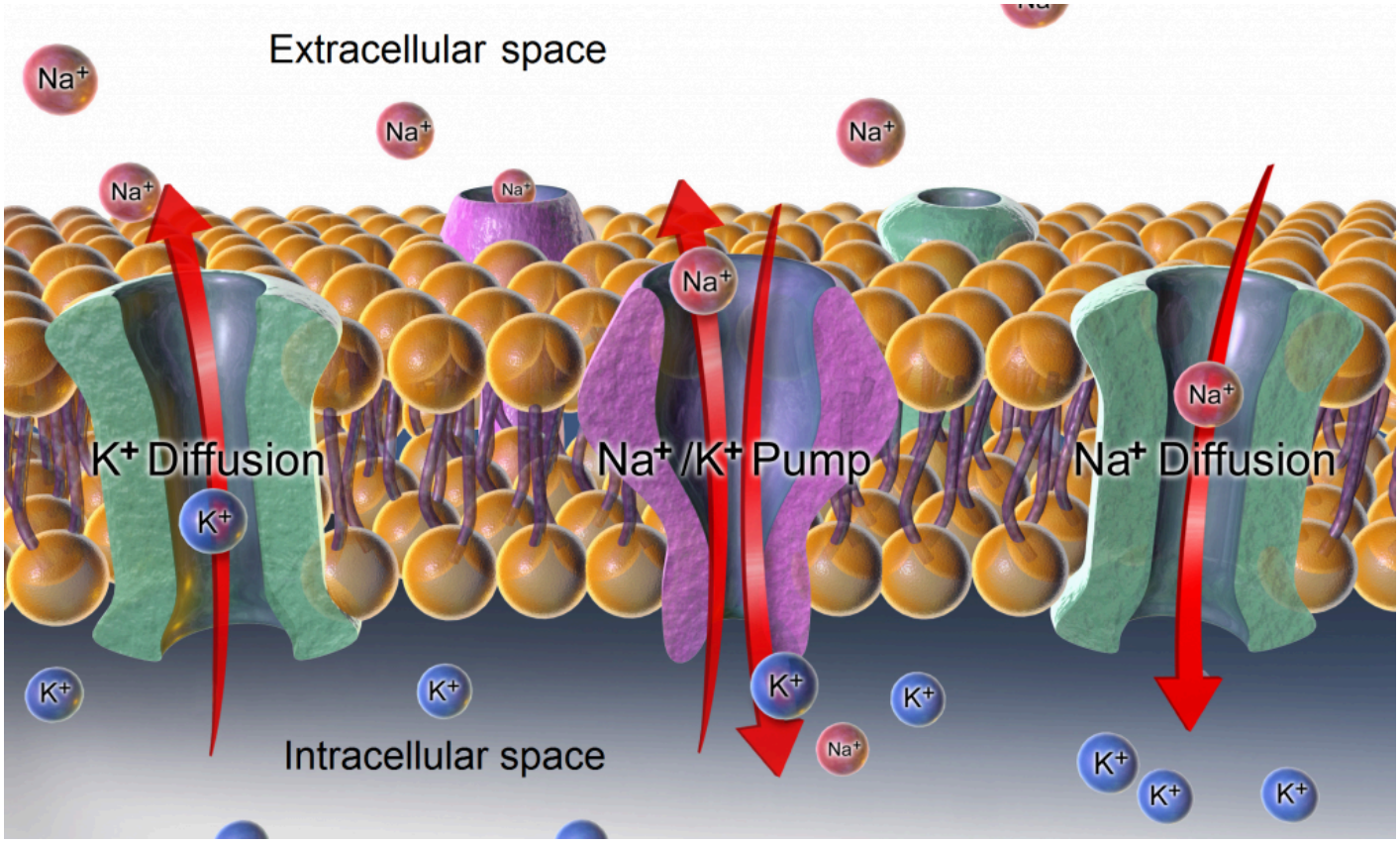

Figure 15.5 Sodium-Potassium Pump

Fluid and Electrolyte Regulation

The body must carefully regulate intravascular fluid accumulation and excretion to prevent fluid volume excesses or deficits and maintain adequate blood pressure. Water balance is regulated by several mechanisms including antidiuretic hormone (ADH), thirst, and the Renin-Angiotensin-Aldosterone System (RAAS).

Fluid intake is regulated by thirst. As fluid is lost and the sodium level increases in the intravascular space, serum osmolality increases. Serum **osmolality** is a measure of the concentration of dissolved solutes in the blood. Osmoreceptors in the hypothalamus sense increased serum osmolarity levels and trigger the release of ADH (antidiuretic hormone) in the kidneys to retain fluid. The osmoreceptors also produce the feeling of thirst to stimulate increased fluid intake. However, individuals must be able to mentally and physically respond to thirst signals to increase their oral intake. They must be

alert, fluids must be accessible, and the person must be strong enough to reach for fluids. When a person is unable to respond to thirst signals, dehydration occurs. Older individuals are at increased risk of dehydration due to age-related impairment in thirst perception. The average adult intake of fluids is about 2,500 mL per day from both food and drink. An increased amount of fluids is needed if the client has other medical conditions causing excessive fluid loss, such as sweating, fever, vomiting, diarrhea, and bleeding.

The **Renin-Angiotensin-Aldosterone System (RAAS)** plays an important role in regulating fluid output and blood pressure. See Figure 15.6[12] for an illustration of the Renin-Angiotensin-Aldosterone System (RAAS). When there is decreased blood pressure (which can be caused by fluid loss), specialized kidney cells make and secrete renin into the bloodstream. Renin acts on angiotensinogen released by the liver and converts it to angiotensin I, which is then converted to angiotensin II. Angiotensin II does a few important things. First, angiotensin II causes vasoconstriction to increase blood flow to vital organs. It also stimulates the adrenal cortex to release aldosterone. Aldosterone is a steroid hormone that triggers increased sodium reabsorption by the kidneys and subsequent increased serum osmolality in the bloodstream. As you recall, increased serum osmolality causes osmosis to move fluid into the intravascular compartment in an effort to equalize solute particles. The increased fluids in the intravascular compartment increase circulating blood volume and help raise the person's blood pressure. An easy way to remember this physiological process is "aldosterone saves salt" and "water follows salt."[13]

12. "2626_Renin_Aldosterone_Angiotensin.jpg" by OpenStax is licensed under CC BY 3.0. Access for free at https://openstax.org/books/anatomy-and-physiology/pages/25-4-microscopic-anatomy-of-the-kidney

13. Fountain, J. H. (2023). *Physiology, renin angiotensin system*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK470410/

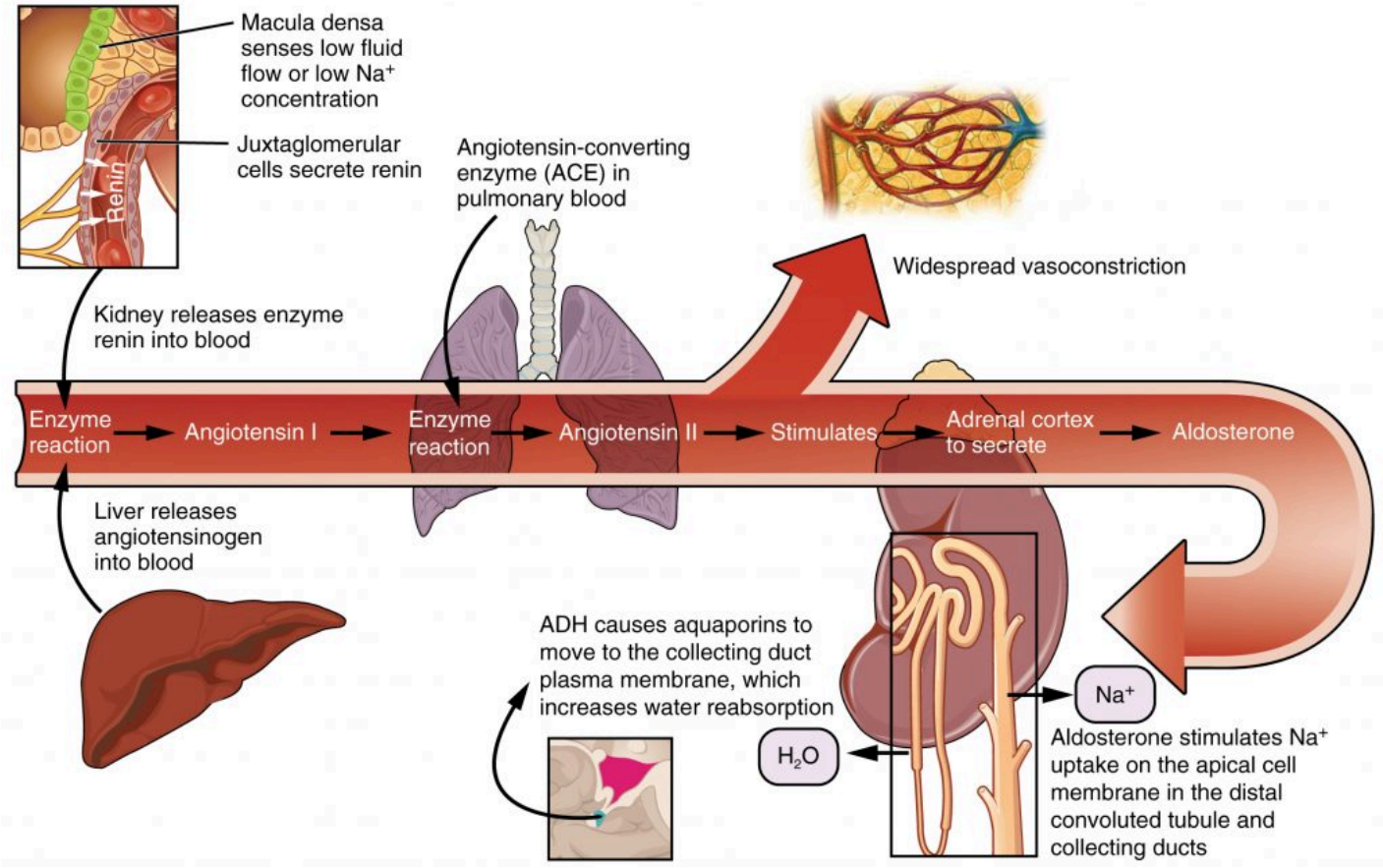

Figure 15.6 Renin Angiotensin Aldosterone System (RAAS)

Fluid output occurs mostly through the kidneys in the form of urine. Fluid is also lost through the skin as perspiration, through the gastrointestinal tract in the form of stool, and through the lungs during respiration. Forty percent of daily fluid output occurs due to these “insensible losses” through the skin, gastrointestinal tract, and lungs and cannot be measured. The remaining 60% of daily fluid output is in the form of urine. Normally, the kidneys produce about 1,500 mL of urine per day when fluid intake is adequate. Decreased urine production is an early sign of dehydration or kidney dysfunction. It is important for nurses to assess urine output in clients at risk. If a client demonstrates less than 30 mL/hour (or 0.5 mL/kg/hour) of urine output over eight hours, the provider should be notified for prompt intervention. See

Figure 15.7[14] for an illustration of an average adult's daily water balance of 2,500 mL fluid intake balanced with 2,500 mL fluid output.

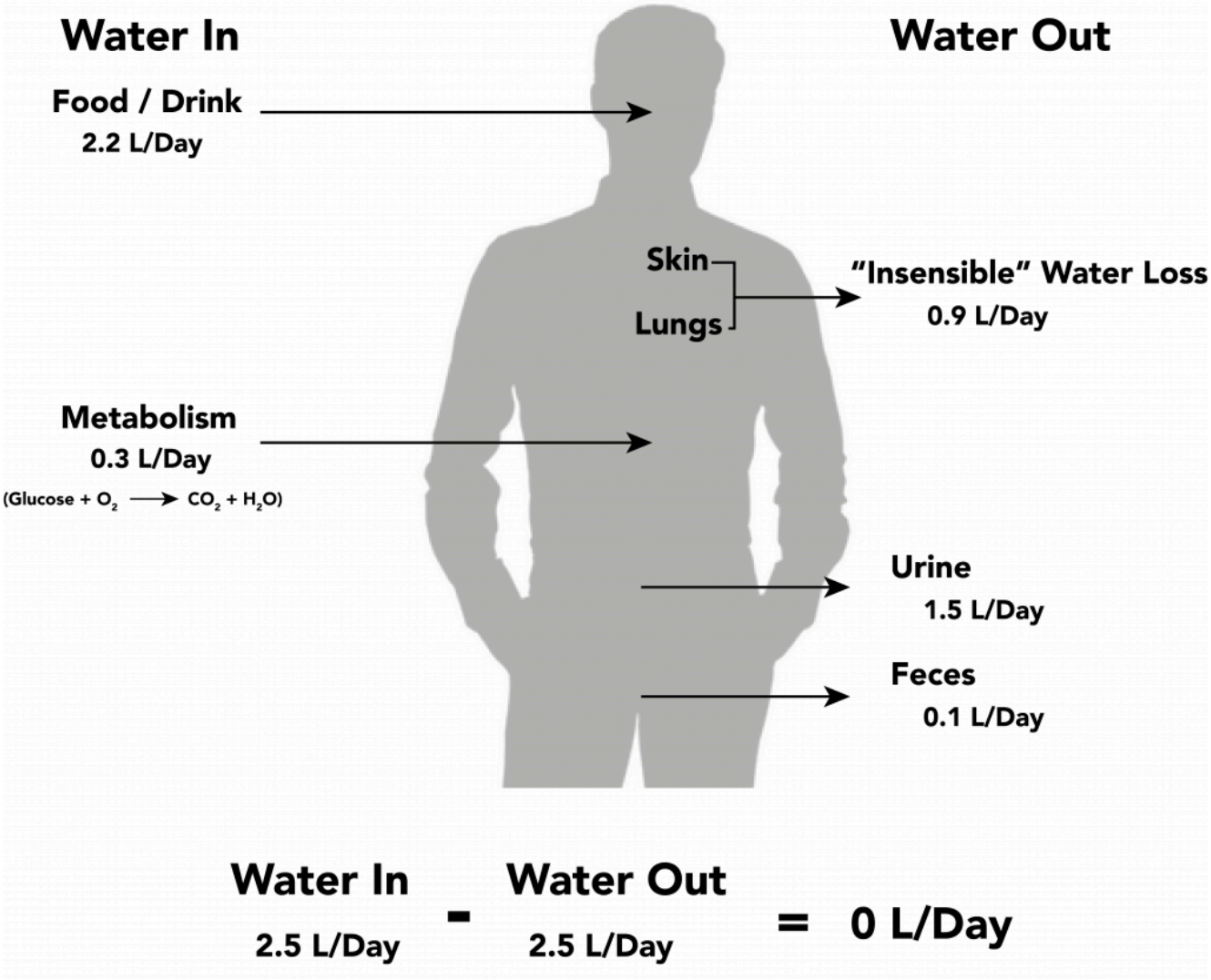

Figure 15.7 Water Balance

Fluid Imbalance

Two types of fluid imbalances are excessive fluid volume (also referred to as

14. "Water_balance.png" by David Walsh and Alan Sved is licensed under CC BY-SA 4.0

hypervolemia) and deficient fluid volume (also referred to as hypovolemia). These imbalances primarily refer to imbalances in the extracellular compartment but can cause fluid movement in the intracellular compartments based on the sodium level of the blood.

Excessive Fluid Volume

Excessive fluid volume (also referred to as hypervolemia) occurs when there is increased fluid retained in the intravascular compartment. Clients at risk for developing excessive fluid volume are those with the following conditions:

- Heart Failure
- Kidney Failure
- Cirrhosis
- Pregnancy[15]

Symptoms of fluid overload include pitting edema, ascites, and dyspnea and crackles from fluid in the lungs. Edema is swelling in dependent tissues due to fluid accumulation in the interstitial spaces. Ascites is fluid retained in the abdomen.

Treatment depends on the cause of the fluid retention. Sodium and fluids are typically restricted, and diuretics are often prescribed to eliminate the excess fluid. For more information about the nursing care of clients with excessive fluid volume, see the "Applying the Nursing Process" section.

Deficient Fluid Volume

Deficient fluid volume (also referred to as hypovolemia or dehydration) occurs when loss of fluid is greater than fluid input. Common causes of deficient

15. Lewis, J. L., III. (2020). *Volume overload*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/fluid-metabolism/volume-overload

fluid volume are diarrhea, vomiting, excessive sweating, fever, and poor oral fluid intake. Individuals who have a higher risk of dehydration include the following:

- Older adults
- Infants and children
- Clients with chronic diseases such as diabetes mellitus and kidney disease
- Clients taking diuretics and other medications that cause increased urine output
- Individuals who exercise or work outdoors in hot weather[16]

In adults, symptoms of dehydration are as follows:

- Feeling very thirsty
- Dry mouth
- Headache
- Dry skin
- Urinating and sweating less than usual
- Dark, concentrated urine
- Feeling tired
- Changes in mental status
- Dizziness due to decreased blood pressure
- Elevated heart rate[17]

In infants and young children, additional symptoms of dehydration include the following:

16. U.S. National Library of Medicine. (2023). *Dehydration*. MedlinePlus. https://medlineplus.gov/dehydration.html

17. U.S. National Library of Medicine. (2023). *Dehydration*. MedlinePlus. https://medlineplus.gov/dehydration.html

- Crying without tears
- No wet diapers for three hours or more
- Being unusually sleepy or drowsy
- Irritability
- Eyes that look sunken
- Sunken fontanel[18]

Dehydration can be mild and treated with increased oral intake such as water or sports drinks. Severe cases can be life-threatening and require the administration of intravenous fluids.

For more information about water balance and fluid movement, review the following video.

Video Review of Fluid and Electrolytes[19]

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://wtcs.pressbooks.pub/nursingfundamentals/?p=1420#oembed-1

18. U.S. National Library of Medicine. (2023). *Dehydration*. MedlinePlus. https://medlineplus.gov/dehydration.html

19. Forciea, B. (2017, April 21). *Fluids and electrolytes: Water* [Video]. YouTube. All rights reserved. Video used with permission. https://youtu.be/VMxmDeduKR0

15.3 Intravenous Solutions

OPEN RESOURCES FOR NURSING (OPEN RN)

When clients experience deficient fluid volume, intravenous (IV) fluids are often prescribed. IV fluid restores fluid to the intravascular compartment, and some IV fluids are also used to facilitate the movement of fluid between compartments due to osmosis. There are three types of IV fluids: isotonic, hypotonic, and hypertonic.

Isotonic Solutions

Isotonic solutions are IV fluids that have a similar concentration of dissolved particles as blood. An example of an isotonic IV solution is 0.9% Normal Saline (0.9% NaCl). Because the concentration of the IV fluid is similar to the blood, the fluid stays in the intravascular space and osmosis does not cause fluid movement between compartments. See Figure 15.8[1] for an illustration of isotonic IV solution administration with no osmotic movement of fluid with cells. Isotonic solutions are used for clients with fluid volume deficit (also called hypovolemia) to raise their blood pressure. However, infusion of too much isotonic fluid can cause excessive fluid volume (also referred to as **hypervolemia**).

1. "Blausen_0685_OsmoticFlow_Isotonic.png" by BruceBlaus.com staff is licensed under CC BY 3.0

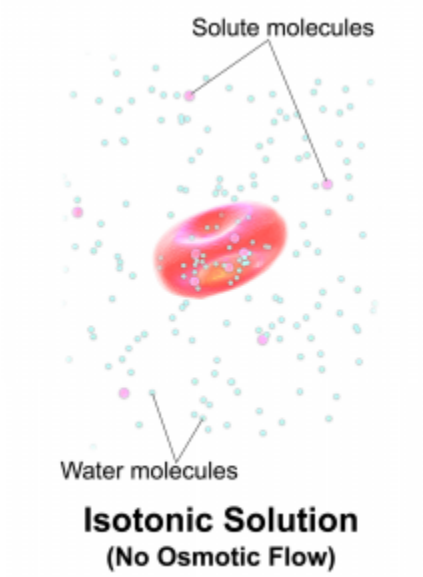

Figure 15.8 Lack of Fluid Movement When Isotonic IV Solution Is Administered

Hypotonic Solutions

Hypotonic solutions have a lower concentration of dissolved solutes than blood. An example of a hypotonic IV solution is 0.45% sodium chloride (0.45% NaCl). When hypotonic IV solutions are infused, it results in a decreased concentration of dissolved solutes in the blood as compared to the intracellular space. This imbalance causes osmotic movement of water from the intravascular compartment into the intracellular space. For this reason, hypotonic fluids are used to treat cellular dehydration. See Figure 15.9[2] for an illustration of the osmotic movement of fluid into a cell when a hypotonic IV solution is administered, causing lower concentration of solutes (pink molecules) in the bloodstream compared to within the cell.

However, if too much fluid moves out of the intravascular compartment

2. "Blausen_0684_OsmoticFlow_Hypotonic.png" by BruceBlaus.com staff is licensed under CC BY 3.0

into cells, cerebral edema can occur. It is also possible to cause worsening hypovolemia and hypotension if too much fluid moves out of the intravascular space and into the cells. Therefore, client status should be monitored carefully when hypotonic solutions are infused.

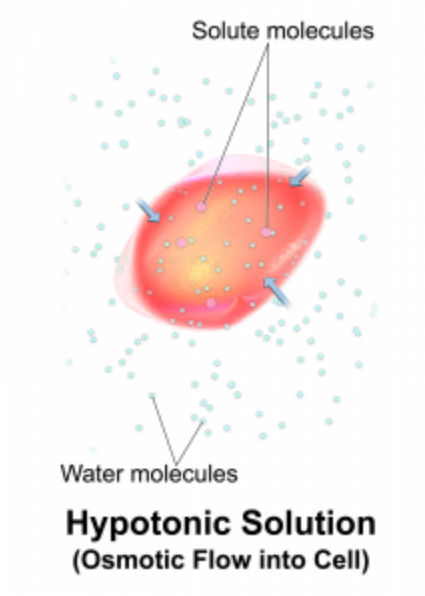

Figure 15.9 Hypotonic IV Solution Causing Osmotic Movement of Fluid Into Cell

Hypertonic Solutions

Hypertonic solutions have a higher concentration of dissolved particles than blood. An example of hypertonic IV solution is 3% sodium chloride (3% NaCl). When infused, hypertonic fluids cause an increased concentration of dissolved solutes in the intravascular space compared to the cells. This causes the osmotic movement of water out of the cells and into the intravascular space to dilute the solutes in the blood. See Figure 15.10[3] for an illustration of

3. "Blausen_0683_OsmoticFlow_Hypertonic.png" by BruceBlaus.com staff is licensed under CC BY 3.0

osmotic movement of fluid out of a cell when hypertonic IV fluid is administered due to a higher concentration of solutes (pink molecules) in the bloodstream compared to the cell.

When administering hypertonic fluids, it is essential to monitor for signs of hypervolemia such as breathing difficulties and elevated blood pressure. Additionally, if hypertonic solutions with sodium are given, the client's serum sodium level should be closely monitored.[4] See Table 15.3 for a comparison of types of IV solutions, their uses, and nursing considerations.

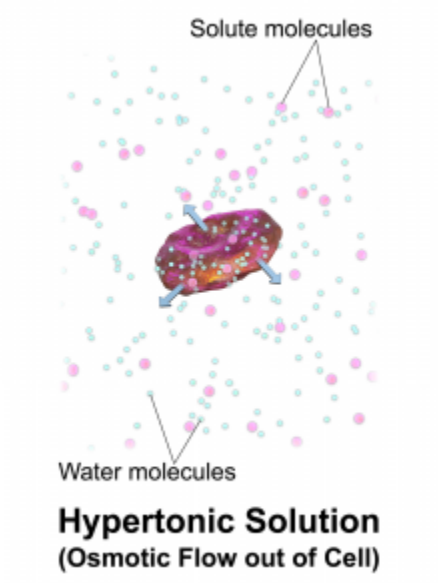

Figure 15.10 Hypertonic IV Solution Causing Osmotic Fluid Movement Out of a Cell

See Figure 15.11[5] for an illustration comparing how different types of IV solutions affect red blood cell size.

4. Harris, H. (2011). I.V. fluids: What nurses need to know. *Nursing2017, 41*(5), 30-38.

5. "Osmotic pressure on blood cells diagram.svg" by LadyofHats is in the Public Domain

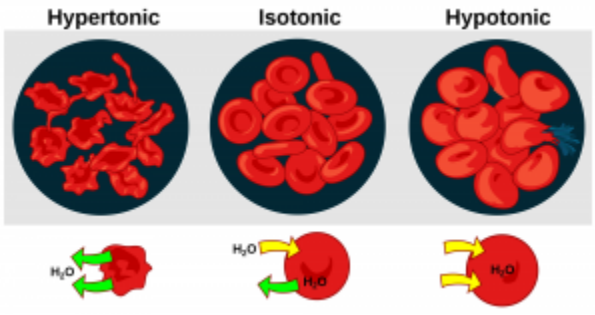

Figure 15.11 Comparison of Osmotic Effects of Hypertonic, Isotonic, and Hypotonic IV Fluids on Red Blood Cells

Table 15.3 Comparison of IV Solutions[6,7,8]

6. Harris, H. (2011). I.V. fluids: What nurses need to know. *Nursing2017, 41*(5), 30-38.

7. Hospira. (2006). *5% Dextrose and 0.45% Sodium Chloride Injection, USP.* https://www.accessdata.fda.gov/drugsatfda_docs/label/2006/017607s123lbl.pdf

8. National Institutes of Health. (2024). *5% dextrose in lactated ringers.* DailyMed. https://dailymed.nlm.nih.gov/dailymed/fda/fdaDrugXsl.cfm?setid=190da07e-a616-46e6-b4e5-1c0ba39306e5&type=display

Type	IV Solution	Uses	Nursing Considerations
Isotonic	0.9% Normal Saline (0.9% NaCl)	Fluid resuscitation for hemorrhaging, severe vomiting, diarrhea, GI suctioning losses, wound drainage, mild hyponatremia, or blood transfusions.	Monitor closely for hypervolemia, especially with heart failure or renal failure.
Isotonic	Lactated Ringer's Solution (LR)	Fluid resuscitation, GI tract fluid losses, burns, traumas, or metabolic acidosis. Often used during surgery.	Should not be used if serum pH is greater than 7.5 because it will worsen alkalosis. May elevate potassium levels if used with renal failure.
Hypotonic	0.45% Sodium Chloride (0.45% NaCl)	Used to treat intracellular dehydration and hypernatremia and to provide fluid for renal excretion of solutes.	Monitor closely for hypovolemia, hypotension, or confusion due to fluid shifting into the intracellular space, which can be life-threatening. Avoid use in clients with liver disease, trauma, and burns to prevent hypovolemia from worsening. Monitor closely for cerebral edema.
Hypotonic	5% Dextrose in Water (D5W) *starts as isotonic and then changes to hypotonic when dextrose is metabolized	Provides free water to promote renal excretion of solutes and treat hypernatremia, as well as some dextrose supplementation.	Monitor closely for hypovolemia, hypotension, or confusion due to fluid shifting out of the intravascular space, which can be life-threatening. Avoid use in clients with liver disease, trauma, and burns to prevent hypovolemia from worsening. Monitor closely for cerebral edema.

Hypertonic	3% Sodium Chloride (3% NaCl)	Used to treat severe hyponatremia and cerebral edema.	Monitor closely for hypervolemia, hypernatremia, and associated respiratory distress. Do not use it with clients experiencing heart failure, renal failure, or conditions caused by cellular dehydration because it will worsen these conditions.
Hypertonic	5% Dextrose and 0.45% Sodium Chloride (D5 0.45% NaCl)	Replacement of fluid, minimal carbohydrate calories, and sodium chloride; hypoglycemia.	Monitor closely for hypervolemia, hypernatremia, and associated respiratory distress. Do not use it with clients experiencing heart failure, renal failure, or conditions caused by cellular dehydration because it will worsen these conditions.
Hypertonic	5% Dextrose and Lactated Ringer's (D5LR) D10	Replacement of fluid, electrolyte, and calories; hypoglycemia. Lactated ringers provide some alkalizing action in the blood.	Monitor closely for hypervolemia, hypernatremia, and associated respiratory distress. Do not use it with clients experiencing heart failure, renal failure, or conditions caused by cellular dehydration because it will worsen these conditions.

Osmolarity is defined as the proportion of dissolved particles

in an amount of fluid and is generally the term used to describe body fluids. As the dissolved particles become more concentrated, the osmolarity increases. **Osmolality** refers to the proportion of dissolved particles in a specific weight of fluid. The terms osmolarity and osmolality are often used interchangeably in clinical practice.

15.4 Electrolytes

OPEN RESOURCES FOR NURSING (OPEN RN)

Electrolytes play an important role in bodily functions and fluid regulation. There is a very narrow target range for normal electrolyte values, and slight abnormalities can have devastating consequences. For this reason, it is crucial to understand normal electrolyte ranges, causes of electrolyte imbalances, signs and symptoms of imbalances, and appropriate treatments.

Sodium

Sodium levels in the blood typically range from 136-145 mEq/L.[1] Refer to each agency's normal reference range on the lab report. Sodium is the most abundant electrolyte in the extracellular fluid (ECF) and is maintained by the sodium-potassium pump. Sodium plays an important role in maintaining adequate fluid balance in the intravascular and interstitial spaces. See the "Fluid and Electrolyte Regulation" subsection of this chapter for more information about how the body regulates sodium and water balance.

Hypernatremia refers to an elevated sodium level in the blood. Typically, hypernatremia is caused by excess water loss due to lack of fluid intake, vomiting, or diarrhea. As you recall, elevated sodium levels in the blood cause the osmotic movement of water out of the cells to dilute the blood. This causes the body's cells to shrink, referred to as cellular dehydration. This fluid shift can have a significant impact on various organs within the body and is especially notable in the client's neurological function. As fluid shifts out of the brain cells, the nurse may notice symptoms such as confusion, irritability, lethargy, and even seizures. Other signs and symptoms of hypernatremia

1. Testing.com. (2022). *Sodium test*. Testing.com. https://www.testing.com/tests/sodium/

include severe thirst and sticky mucous membranes. See Figure 15.12[2] for an illustration of a client with severe thirst due to hypernatremia. Treatment for hypernatremia includes decreasing sodium intake, increasing oral water intake, and rehydrating with a hypotonic IV solution.[3,4]

Figure 15.12 Hypernatremia

Hyponatremia refers to a decreased sodium level in the blood. Hyponatremia can be caused by excess water intake or excessive administration of hypotonic IV solutions. For example, a marathon runner who only rehydrates with water instead of sports drinks (that include solutes as well as water) can develop hyponatremia. As with hypernatremia, altered sodium levels often cause neurological symptoms due to the movement of water into brain cells, causing them to swell. Symptoms of hyponatremia are headache, confusion, seizures, and coma. Treatment for hyponatremia depends on the cause and

2. "thirsty-4294629_960_720.png" by Conmongt is licensed under CC0

3. Lewis, J. L., III. (2020). *Hypernatremia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hypernatremia

4. Brinkman, J. E. (2023). *Physiology, body fluids*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK482447/#:~:text=The%20distribution%20of%20fluid%20throughout,as%20the%20cytoplasm%20of%20cells

often consists of limiting water intake or discontinuing administration of hypotonic IV fluids. If hyponatremia is severe, a hypertonic IV saline solution may be prescribed to gradually raise the client's sodium level.[5]

View helpful mnemonics related to hyponatremia and hypernatremia from RegisteredNurseRN.com.

Video Review of Fluids and Electrolytes: Sodium[6]

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://wtcs.pressbooks.pub/nursingfundamentals/?p=1424#oembed-1

5. Lewis, J. L., III. (2020). *Hyponatremia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hyponatremia

6. Forciea, B.(2017, April 24). *Fluids and electrolytes sodium* [Video]. YouTube. All rights reserved. Video used with permission. https://youtu.be/ar-WrfC7SJs

Potassium

Potassium levels normally range from 3.5 to 5.1 mEq/L.[7] Refer to each agency's normal reference range on the lab report. Potassium is the most abundant electrolyte in intracellular fluid and is maintained inside the cell by the sodium-potassium pump. Potassium is regulated by aldosterone in the kidneys and is obtained in the diet through consumption of foods such as bananas, oranges, and tomatoes. See Figure 15.13[8] for an illustration of potassium regulation by aldosterone. Recall that aldosterone causes reabsorption of sodium and excretion of potassium in the distal tubule of the kidneys. In response to potassium levels rising or sodium levels falling in the bloodstream, the adrenal cortex releases aldosterone and targets the kidneys. In response, the kidneys excrete potassium and reabsorb sodium. Potassium is also impacted by the hormone insulin that moves potassium into the cells from the ECF.[9]

7. Testing.com. (2023). *Potassium test*. Testing.com. https://www.testing.com/tests/potassium/

8. "2711_Aldosterone_Feedback_Loop-01.jpg" by OpenStax College is licensed under CC BY 3.0. Access for free at https://openstax.org/books/anatomy-and-physiology/pages/26-3-electrolyte-balance

9. Betts, J. G., Desaix, P., Johnson, E., Johnson, J. E., Korol, O., Kruse, D., Poe, B., Wise, J., Womble, M. D., & Young, K. A. (2022). *Anatomy and physiology 2e*. OpenStax. https://openstax.org/books/anatomy-and-physiology/pages/1-introduction

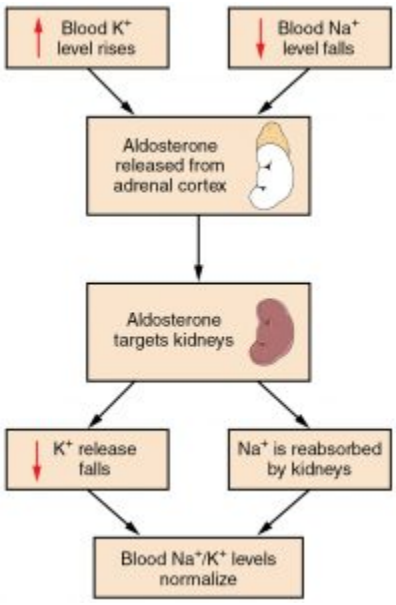

Figure 15.13 Potassium Regulation by Aldosterone

Potassium is necessary for normal cardiac function, neural function, and muscle contractility, including effective contractility of the cardiac muscles. Abnormal potassium levels can cause significantly abnormal heart rhythms and contractility. Potassium is poorly conserved by the body, and much is lost with urine output. For this reason, it is often necessary to provide potassium supplements when administering loop and thiazide diuretics because potassium is excreted from the kidneys along with water.[10] Potassium supplementation can be given orally or by IV infusion mixed with fluids. Potassium must NEVER be administered IV push because it can immediately stop the heart.

Hyperkalemia refers to increased potassium levels in the blood.

10. Lewis, J. L., III. (2020). *Overview of disorders of potassium concentration*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/overview-of-disorders-of-potassium-concentration

Hyperkalemia can be caused by kidney failure, metabolic acidosis, and administration of potassium-sparing diuretics or oral/intravenous potassium supplements. Signs and symptoms of hyperkalemia are generally cardiac in nature and include irritability, cramping, diarrhea, and electrocardiogram (ECG) abnormalities. As hyperkalemia worsens, ECG abnormalities may progress to cardiac dysrhythmias and cardiac arrest.

Treatment for hyperkalemia depends on the severity of the hyperkalemia symptoms. For mild symptoms, decreased potassium intake in the diet is helpful. Adjustment to medications contributing to increased levels of potassium may be indicated. For severe symptoms, administration of sodium polystyrene sulfonate (Kayexalate) orally or rectally helps bind excess potassium, so it is excreted through the GI tract. Insulin may be administered to push potassium into cells and decrease serum potassium levels. When administering an insulin infusion, it is important to monitor blood glucose levels closely, often hourly per agency policy. The client often requires supplemental IV dextrose to prevent low blood sugar levels when insulin is used for potassium reduction. IV calcium gluconate may also be given to prevent excess potassium from affecting cardiac muscle. This is a temporary measure and wears off quickly but allows time for other treatments to take effect and lower potassium levels before cardiac arrest develops. For severe symptomatic hyperkalemia, temporary hemodialysis may also be used to quickly decrease potassium levels.[11]

Hypokalemia refers to decreased potassium level in the blood. Hypokalemia can be caused by excessive vomiting, diarrhea, potassium-wasting diuretics, and insulin use, as well as lack of potassium in the diet. Signs and symptoms of hypokalemia include weakness, arrhythmias, lethargy, and a thready pulse. Treatment for hypokalemia includes increasing oral intake of potassium in the diet and oral or IV potassium in fluids supplementation. It is important to remember that administering IV potassium too quickly can cause cardiac

11. Lewis, J. L., III. (2020). *Hyperkalemia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hyperkalemia

arrest. In fact, potassium is one of the ingredients used during lethal injection to stop the heart.

View helpful mnemonics for hypokalemia and hyperkalemia from RegisteredNurseRN.com.

Video Review About Potassium[12]

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://wtcs.pressbooks.pub/nursingfundamentals/?p=1424#oembed-2

Calcium

Calcium levels normally range from 8.6-10.2 mg/dL.[13] Refer to each agency's normal reference range on the lab report. Calcium circulates in the bloodstream, but the majority is stored in bones. Calcium is important for bone and teeth structure, nerve transmission, and muscle contraction. Calcium excretion and reabsorption are regulated by the parathyroid hormone (PTH) that is secreted from the parathyroid glands near the thyroid.

12. Forciea, B. (2017, April 26). *Fluids and electrolytes potassium* [Video]. YouTube. All rights reserved. Video used with permission. https://youtu.be/SNAiGaaYkvs

13. Testing.com. (2022). *Calcium test*. Testing.com. https://www.testing.com/tests/calcium/

See Figure 15.14[14] for an illustration of the parathyroid glands. As PTH is secreted in response to low calcium levels in the blood, calcium is reabsorbed in both the kidneys and the intestine and released from the bones to increase serum calcium levels. Calcium is also affected by dietary intake and physical activity. Activity causes calcium to move into bones whereas immobility causes the release of calcium from bones, which causes them to become weak. Dietary sources of calcium include dairy products, green leafy vegetables, sardines, and whole grains.[15]

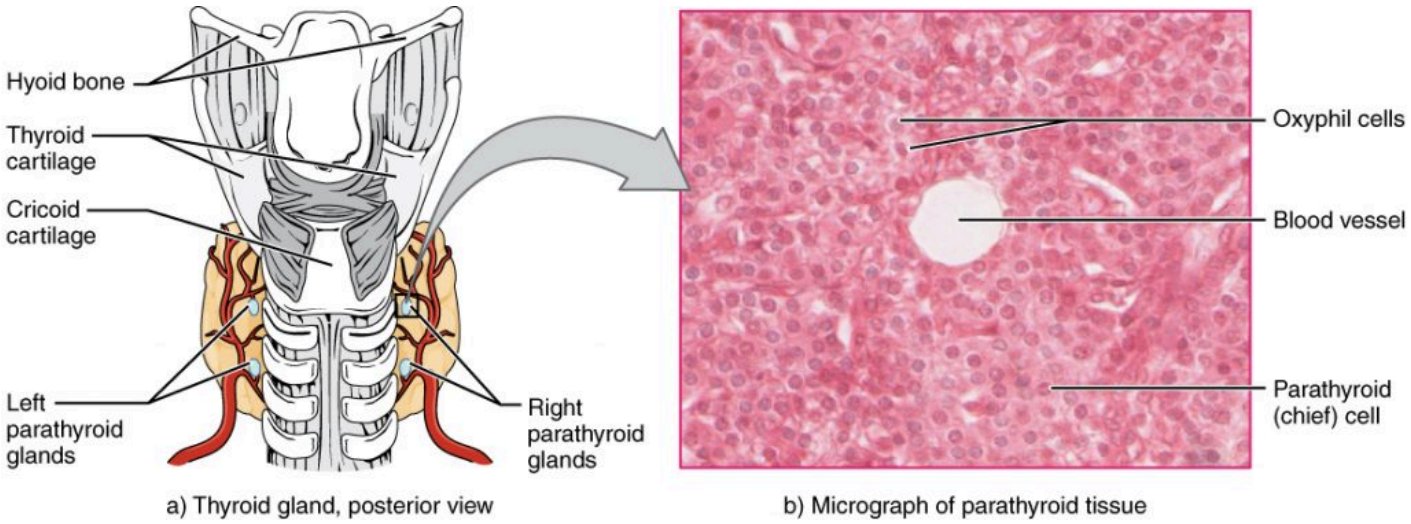

Figure 15.14 Parathyroid Glands

Hypercalcemia refers to an increased calcium level. It can be caused by

14. "1814_The_Parathyroid_Glands.jpg" by OpenStax is licensed under CC BY 3.0. Access for free at https://openstax.org/books/anatomy-and-physiology/pages/17-5-the-parathyroid-glands

15. Lewis, J. L., III. (2020). *Overview of disorders of calcium concentration*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/overview-of-disorders-of-calcium-concentration

prolonged immobilization that allows calcium to leach out of the bones and into the serum. Additionally, there are many types of cancers that may cause excessive calcium release from bones. Hypercalcemia can also be caused by hyperparathyroidism and parathyroid tumors, which can cause too much PTH secretion, causing too much calcium to be reabsorbed in the kidneys and intestines and released from bone.

Signs and symptoms of hypercalcemia often impact the gastrointestinal and musculoskeletal systems. These symptoms include nausea, vomiting, constipation, increased thirst and/or urination, and skeletal muscle weakness. Treatment for hypercalcemia includes decreasing calcium intake in the diet, phosphate supplementation (which has an inverse relationship to calcium), hemodialysis, surgical removal of the parathyroid gland (if hyperparathyroidism is causing the hypercalcemia), and weight-bearing exercises as tolerated.[16]

Hypocalcemia refers to a decreased calcium level in the blood. Hypocalcemia can be caused by hypoparathyroidism where not enough PTH is excreted, causing a decreased reabsorption of calcium and decreased release of calcium from the bones. Hypocalcemia is also caused by vitamin D deficiency and renal disease. Because phosphorus is inversely related to calcium, an abnormally high phosphorus level as seen with renal failure can also result in hypocalcemia.

Signs and symptoms of hypocalcemia often impact the musculoskeletal and nervous systems. These include paresthesias (numbness and tingling) of the lips, tongue, hands and feet, muscle cramps, and tetany. **Chvostek's sign** is a classic sign of acute hypocalcemia and is an involuntary twitching of facial muscles when the facial nerve is tapped. A second classic sign of acute hypocalcemia is **Trousseau's sign** where a hand spasm is caused by inflating a blood pressure cuff to a level above the client's systolic pressure for three minutes. See a video of a client experiencing Chvostek's and Trousseau's signs

16. Lewis, J. L., III. (2020). *Hypercalcemia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hypercalcemia

below. Treatment of hypocalcemia includes increasing oral intake of dietary calcium and vitamin D and oral or IV calcium supplementation and decreasing the phosphorus level if it is elevated.[17]

View a video of a client exhibiting Chvostek's Sign and Trousseau's Sign of hypocalcemia.

View helpful mnemonics for hypercalcemia and hypocalcemia from RegisteredNurseRN.com.

Phosphorus

Phosphorus levels typically range from 2.5-4.0 mg/dL. Refer to each agency's normal reference range on the lab report. Phosphorus is stored in the bones and is predominantly found in the ICF with small amounts in the ECF. Phosphorus is important in energy metabolism, RNA and DNA formation, nerve function, muscle contraction, and for bone, teeth, and membrane building and repair. Phosphorus is excreted by the kidneys and absorbed by the intestines. Dietary phosphorus sources include dairy products, fruits, vegetables, meat, and cereal.[18]

17. Lewis, J. L., III. (2020). *Hypocalcemia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hypocalcemia

18. Lewis, J. L., III. (2020). *Overview of disorders of phosphate concentration*. Merck Manual Professional Version. https://www.merckmanuals.com/

Hyperphosphatemia refers to an increased phosphorus level in the blood and can be caused by kidney disease, crush injuries, or overuse of phosphate-containing enemas. Hyperphosphatemia itself is usually asymptomatic, but signs of associated hypocalcemia may be present due to the inverse relationship between phosphorus and calcium. Treatment for hyperphosphatemia includes decreasing intake of phosphorus, administration of phosphate-binder medications to help with excretion, and hemodialysis.[19]

Hypophosphatemia is a decreased phosphorus level in the blood. Acute hypophosphatemia can be caused by acute alcohol abuse, burns, diuretic use, respiratory alkalosis, resolving diabetic ketoacidosis, and starvation. Chronic hypophosphatemia is caused by hyperparathyroidism, vitamin D deficiency, prolonged use of phosphate binders, and hypomagnesemia or hypokalemia. Hypophosphatemia is usually asymptomatic, but in severe cases, it can cause muscle weakness, anorexia, encephalopathy, seizures, and death. Treatment for hypophosphatemia includes treating what is causing the imbalance, oral or IV phosphorus replacement, and increased phosphate-containing foods in the diet.[20]

Magnesium

Magnesium levels typically range from 1.5-2.4 mEq/L. Refer to each agency's reference range on the lab report. Magnesium is essential for normal cardiac,

professional/endocrine-and-metabolic-disorders/electrolyte-disorders/overview-of-disorders-of-phosphate-concentration

19. Lewis, J. L., III. (2020). *Hyperphosphatemia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hyperphosphatemia

20. Lewis, J. L., III. (2020). *Hypophosphatemia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hypophosphatemia

nerve, muscle, and immune system functioning. About half of the body's magnesium is stored in the bones. About 1% is stored in ECF and the rest is found in ICF.[21] Dietary sources of magnesium include green leafy vegetables, citrus, peanut butter, almonds, legumes, and chocolate.

Hypermagnesemia refers to an elevated magnesium level in the blood. It is usually the result of renal failure, excess magnesium replacement, or use of magnesium containing laxatives or antacids. Signs and symptoms of hypermagnesemia include bradycardia, weak and thready pulse, lethargy, tremors, hyporeflexia, muscle weakness, and cardiac arrest. Treatment for hypermagnesemia involves increasing fluid intake, discontinuing magnesium-containing medications, and in severe cases, hemodialysis or peritoneal dialysis. Additionally, administration of calcium gluconate can be helpful to reduce the cardiac effects of hypermagnesemia until the magnesium level can be lowered.[22]

Hypomagnesemia refers to decreased magnesium level in the blood. It typically results from inadequate magnesium in the diet or from loop diuretics that excrete magnesium. Clients with alcohol use disorder often have hypomagnesemia due to concurrent poor diet and impaired nutrient absorption that occurs with alcohol consumption. Chronic proton pump inhibitor use can also cause hypomagnesemia due to impaired nutrient absorption.

Signs and symptoms of hypomagnesemia include nausea, vomiting, lethargy, weakness, leg cramps, tremor, dysrhythmias, and tetany that is associated with concurrent hypocalcemia that can occur with

21. Lewis, J. L., III. (2020). *Overview of disorders of magnesium concentration*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/overview-of-disorders-of-magnesium-concentration

22. Lewis, J. L., III. (2020). *Hypermagnesemia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hypermagnesemia

hypomagnesemia. Treatment for hypomagnesemia consists of increasing dietary intake of magnesium containing foods and oral or IV magnesium supplementation.[23]

> View helpful mnemonics for hypermagnesemia and hypomagnesemia from RegisteredNurseRN.com.

See Table 15.4 for a comparison of causes, symptoms, and treatments of different electrolyte imbalances. As always, refer to agency lab reference ranges when providing client care.

Table 15.4 Comparison of Causes, Symptoms, and Treatments of Imbalanced Electrolyte Levels

23. Lewis, J. L., III. (2020). *Hypomagnesemia*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/endocrine-and-metabolic-disorders/electrolyte-disorders/hypomagnesemia 7/7/20

	Elevated Level	Decreased Level
Sodium (Na+) Normal range 136-145 mEq/L	**Hypernatremia** **Causes:** Excessive salt intake **Symptoms:** Lethargy, irritability, seizures, and weakness **Treatments:** Rehydrate w/ D5W and increase water intake	**Hyponatremia** **Causes:** Excessive water intake and diuretics **Symptoms:** Headache, confusion, and coma **Treatments:** 3% NS and fluid restriction
Potassium (K+) Normal range 3.5-5.1 mEq/L	**Hyperkalemia** **Causes:** Kidney dysfunction, excessive potassium intake, and ACE inhibitors **Symptoms:** Cardiac arrhythmias, cramping, diarrhea, and irritability **Treatments:** Limit potassium in diet, loop diuretic, insulin, dialysis, and kayexalate	**Hypokalemia** **Causes:** Deficient intake of potassium-rich foods, loop and thiazide diuretics, and IV administration of insulin **Symptoms:** Weakness, arrhythmias, lethargy, and thready pulse (WALT) **Treatments:** PO/IV potassium and increase K+ in diet
Calcium (Ca++) Normal range 8.6 -10.2 mg/dL	**Hypercalcemia** **Causes:** Overactive parathyroid glands and cancer **Symptoms:** Nausea, vomiting, constipation, and thirst **Treatments**: Decrease calcium in diet, increase mobility, and administer phosphorous	**Hypocalcemia** **Causes:** Diuretic use and removal of parathyroid glands **Symptoms:** Numbness, tingling, Chvostek's sign, and Trousseau's sign (tetany) **Treatments:** Increase Ca++ in diet and IV/PO calcium

Magnesium (Mg+) Normal range 1.5-2.4 mg/dL	**Hypermagnesemia** **Causes:** Kidney disease and excessive magnesium intake (i.e., laxatives and antacids) **Symptoms:** Muscle weakness, bradycardia, asystole, tremors, and slow reflexes **Treatments:** Dialysis, increased fluid intake, and stopping medications containing Mg+	**Hypomagnesemia** **Causes:** Diuretics, undernutrition, and long-term alcohol use disorder **Symptoms:** Nausea, vomiting, lethargy, weakness, tetany, leg cramps, tremors, and arrhythmias **Treatments:** Increase Mg+ in diet and PO/IV magnesium

15.5 Acid-Base Balance

OPEN RESOURCES FOR NURSING (OPEN RN)

As with electrolytes, correct balance of acids and bases in the body is essential to proper body functioning. Even a slight variance outside of normal can be life-threatening, so it is important to understand normal acid-base values, as well as their causes and how to correct them. The kidneys and lungs work together to correct slight imbalances as they occur. As a result, the kidneys compensate for shortcomings of the lungs, and the lungs compensate for shortcomings of the kidneys.

Arterial Blood Gases

Arterial blood gases (ABG) are measured by collecting blood from an artery, rather than a vein, and are most commonly collected via the radial artery. ABGs measure the pH level of the blood, the partial pressure of arterial oxygen (PaO_2), the partial pressure of arterial carbon dioxide ($PaCO_2$), the bicarbonate level (HCO_3), and the oxygen saturation level (SaO_2).

Prior to collecting blood gases, it is important to ensure the client has appropriate arterial blood flow to the hand. This is done by performing the Allen test. When performing the Allen test, pressure is held on both the radial and ulnar artery below the wrist. Pressure is released from the ulnar artery to check if blood flow is adequate. If arterial blood flow is adequate, warmth and color should return to the hand.

pH

pH is a scale from 0-14 used to determine the acidity or alkalinity of a substance. A neutral pH is 7, which is the same pH as water. Normally, the blood has a pH between 7.35 and 7.45. A blood pH of less than 7.35 is considered acidic, and a blood pH of more than 7.45 is considered alkaline.

The pH of blood is a measure of hydrogen ion concentration. A low pH, less than 7.35, occurs in acidosis when the blood has a high hydrogen ion concentration. A high pH, greater than 7.45, occurs in alkalosis when the blood has a low hydrogen ion concentration. Hydrogen ions are by-products of the metabolism of substances such as proteins, fats, and carbohydrates. These by-products create extra hydrogen ions (H^+) in the blood that need to be balanced and kept within normal range as described earlier.

The body has several mechanisms for maintaining blood pH. The lungs are essential for maintaining pH, and the kidneys also play a role. For example, when the pH is too low (i.e., during acidosis), the respiratory rate quickly increases to eliminate acid in the form of carbon dioxide (CO_2). The kidneys excrete additional hydrogen ions (acid) in the urine and retain bicarbonate (base). Conversely, when the pH is too high (i.e., during alkalosis), the respiratory rate decreases to retain acid in the form of CO_2. The kidneys excrete bicarbonate (base) in the urine and retain hydrogen ions (acid).

$PaCO_2$

$PaCO_2$ is the partial pressure of arterial carbon dioxide in the blood. The normal $PaCO_2$ level is 35-45 mmHg. CO_2 forms an acid in the blood that is regulated by the lungs by changing the rate or depth of respirations.

As the respiratory rate increases or becomes deeper, additional CO_2 is removed, causing decreased acid (H^+) levels in the blood and increased pH (i.e., the blood becomes more alkaline). As the respiratory rate decreases or becomes shallower, less CO_2 is removed, causing increased acid (H^+) levels in the blood and decreased pH (i.e., the blood becomes more acidic).

Generally, the lungs work quickly to regulate the $PaCO_2$ levels and cause a quick change in the pH. Therefore, an acid-base problem caused by

hypoventilation can be quickly corrected by increasing ventilation, and a problem caused by hyperventilation can be quickly corrected by decreasing ventilation. For example, if an anxious client is hyperventilating, they may be asked to breathe into a paper bag to rebreathe some of the CO_2 they are blowing off. Conversely, a postoperative client who is experiencing hypoventilation due to the sedative effects of receiving morphine is asked to cough and deep breathe to blow off more CO_2.

HCO_3

HCO_3 is the bicarbonate level of the blood and the normal range is 22-26. HCO_3 is a base managed by the kidneys and helps to make the blood more alkaline. The kidneys take longer than the lungs to adjust the acidity or alkalinity of the blood, and the response is not visible upon assessment. As the kidneys sense an alteration in pH, they begin to retain or excrete HCO_3, depending on what is needed. If the pH becomes acidic, the kidneys retain HCO_3 to increase the amount of bases present in the blood to increase the pH (i.e., the blood becomes alkaline). Conversely, if the pH becomes alkalotic, the kidneys excrete more HCO_3, causing the pH to decrease (i.e., the blood becomes more acidic).

PaO_2

PaO_2 is the partial pressure of arterial oxygen in the blood. It more accurately measures a client's oxygenation status than SaO_2 (the measurement of hemoglobin saturation with oxygen). Therefore, ABG results are also used to manage clients in respiratory distress.

See Table 15.5a for a review of ABG components, normal values, and key critical values. A critical ABG value means there is a greater risk of serious complications and even death if not corrected rapidly. For example, a pH of 7.10, a shift of only 0.25 below normal, is often fatal because this level of

acidosis can cause cardiac or respiratory arrest or significant hyperkalemia.[1] As you can see, failure to recognize ABG abnormalities can have serious consequences for your clients.

Table 15.5a ABG Components, Descriptions, Adult Normal Values, and Critical Values[2]

1. Mitchel, J. H., Wildenthal, K., & Johnson Jr., R. L. (1972). The effects of acid-base disturbances on cardiovascular and pulmonary function. *Kidney International, 1*, 375-389. https://www.kidney-international.org/article/S0085-2538(15)31047-4/pdf

2. WakeMed Pathology Laboratories. (2016). *Critical values*. https://www.wakemed.org/assets/documents/pathology/lab-critical-values.pdf

ABG Component	Description	Adult Normal Value	Critical Value
pH	• Acidity (<7.35) or alkalinity (>7.45) of blood. • Measure of H+ ions (acids). • Affected by the lungs via hypo- or hyperventilation or the kidneys through bicarbonate retention.	7.35-7.45	**Less than 7.25** **Greater than 7.60**
PaO2	• Pressure of oxygen in the blood.	80-100 mmHg	**Less than 60 mmHg**
PaCO2	• Pressure of carbon dioxide in the blood. • CO2 is an acid managed by the lungs. • As PaCO2 increases, the blood becomes more acidic and the pH decreases. • As PaCO2 decreases, the blood becomes less acidic and more alkaline as the pH increases.	35-45 mmHg	**Less than 25 mmHg** **Greater than 60 mmHg**
HCO3	• Bicarbonate level in the blood. • HCO3 is a base managed by the kidneys. • As HCO3 increases, the blood becomes more alkaline and the pH increases. • As HCO3 decreases, the blood becomes more acidic and the pH decreases.	22-26 mEq/L	**Less than 10 mEq/L** **Greater than 40 mEq/L**
SaO2	• Oxygen saturation in the blood.	95-100%	**Less than 88%**

Video Review of Acid-Base Balance[3]

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://wtcs.pressbooks.pub/nursingfundamentals/?p=1426#oembed-1

Interpreting Arterial Blood Gases

After the ABG results are received, it is important to understand how to interpret them. A variety of respiratory, metabolic, electrolyte, or circulatory problems can cause acid-base imbalances. Correct interpretation helps the nurse and other health care providers determine the appropriate treatment and evaluate the effectiveness of interventions.

Arterial blood gasses can be interpreted as one of four conditions: respiratory acidosis, respiratory alkalosis, metabolic acidosis, or metabolic alkalosis. Once this interpretation is made, conditions can further be classified as compensated, partially compensated, or uncompensated. A simple way to remember how to interpret ABGs is by using the ROME method of interpretation, which stands for **R**espiratory **O**pposite, **M**etabolic **E**qual. This means that the respiratory component (PaCO2) moves in the opposite direction of the pH if the respiratory system is causing the imbalance. If the metabolic system is causing the imbalance, the metabolic component (HCO3) moves in the same direction as the pH. Some nurses find the Tic-Tac-Toe method of interpretation helpful. If you would like to learn more about this method, watch the video below.

3. Forciea, B. (2017, May 10). *Acid-base balance: Bicarbonate ion buffer* [Video]. YouTube. All rights reserved. Video used with permission. https://youtu.be/5_S5wZks9v8

Review of Tic-Tac-Toe Method of ABG Interpretation[4]

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://wtcs.pressbooks.pub/nursingfundamentals/?p=1426#oembed-2

Respiratory Acidosis

Respiratory acidosis develops when carbon dioxide (CO2) builds up in the body (referred to as **hypercapnia**), causing the blood to become increasingly acidic. Respiratory acidosis is identified when reviewing ABGs and the pH level is below 7.35 and the PaCO2 level is above 45, indicating the cause of the acidosis is respiratory. Note that in respiratory acidosis, as the PaCO2 level increases, the pH level decreases. Respiratory acidosis is typically caused by a medical condition that decreases the exchange of oxygen and carbon dioxide at the alveolar level, such as an acute asthma exacerbation, chronic obstructive pulmonary disease (COPD), or an acute heart failure exacerbation causing pulmonary edema. It can also be caused by decreased ventilation from anesthesia, alcohol, or administration of medications such as opioids and sedatives.

Chronic respiratory diseases, such as COPD, often cause chronic respiratory acidosis that is fully compensated by the kidneys retaining HCO3. Because

4. RegisteredNurseRN. (2015, May 6). *ABGs made easy for nurses w/ tic tac toe method for arterial blood gas interpretation* [Video]. YouTube. All rights reserved. Video used with permission. https://youtu.be/URCS4t9aM5o

the carbon dioxide levels build up over time, the body adapts to elevated PaCO2 levels, so they are better tolerated. However, in acute respiratory acidosis, the body has not had time to adapt to elevated carbon dioxide levels, causing mental status changes associated with hypercapnia. Acute respiratory acidosis is caused by acute respiratory conditions, such as an asthma attack or heart failure exacerbation with pulmonary edema when the lungs suddenly are not able to ventilate adequately. As breathing slows and respirations become shallow, less CO2 is excreted by the lungs and PaCO2 levels quickly rise.

Signs of symptoms of hypercapnia vary depending upon the level and rate of CO2 accumulation in arterial blood:

- Clients with mild to moderate hypercapnia may be anxious and/or complain of mild dyspnea, daytime sluggishness, headaches, or hypersomnolence.
- Clients with higher levels of CO2 or rapidly developing hypercapnia develop delirium, paranoia, depression, confusion, or decreased level of consciousness that can progress to seizures and coma as levels continue to rise.

Individuals with normal lung function typically exhibit a depressed level of consciousness when the PaCO2 is greater than 75 to 80 mmHg, whereas clients with chronic hypercapnia may not develop symptoms until the PaCO2 rises above 90 to 100 mmHg.[5]

When a client demonstrates signs of potential hypercapnia, the nurse should assess airway, breathing, and circulation. It is important to note that SaO2 levels may be normal with hypercapnia, and as such should not be the

5. Feller-Kopman, D. J., & Schwartzstein, R. M. (2020). The evaluation, diagnosis, and treatment of the adult patient with acute hypercapnic respiratory failure. *UpToDate*. https://www.uptodate.com/contents/the-evaluation-diagnosis-and-treatment-of-the-adult-patient-with-acute-hypercapnic-respiratory-failure

determining factor in further assessing acid-base issues. Urgent assistance should be sought, especially if the client is in respiratory distress. The provider will order an ABG and prescribe treatments based on assessment findings and potential causes. Treatment for respiratory acidosis typically involves improving ventilation and respiration by removing airway restrictions, reversing oversedation, administering nebulizer treatments, or increasing the rate and depth of respiration by using a BiPAP or CPAP devices. BiPAP and CPAP devices provide noninvasive positive pressure ventilation to increase the depth of respirations, remove carbon dioxide, and oxygenate the client. If these noninvasive interventions are not successful, the client will need to be intubated and placed on mechanical ventilation.[6,7]

> Read more details about oxygenation equipment in "Oxygen Therapy" in Open RN *Nursing Skills, 2e*.

Respiratory Alkalosis

Respiratory alkalosis develops when the body removes too much carbon dioxide through respiration, resulting in increased pH and an alkalotic state. When reviewing ABGs, respiratory alkalosis is identified when pH levels are

6. U.S. National Library of Medicine. (2022). *Respiratory acidosis: Medlineplus medical encyclopedia*. MedlinePlus. https://medlineplus.gov/ency/article/000092.htm

7. Feller-Kopman, D. J., & Schwartzstein, R. M. (2020). The evaluation, diagnosis, and treatment of the adult patient with acute hypercapnic respiratory failure. *UpToDate*. https://www.uptodate.com/contents/the-evaluation-diagnosis-and-treatment-of-the-adult-patient-with-acute-hypercapnic-respiratory-failure

above 7.45 and the $PaCO_2$ level is below 35. With respiratory alkalosis, notice that as the $PaCO_2$ level decreases, the pH level increases.

Respiratory alkalosis is caused by hyperventilation that can occur due to anxiety, panic attacks, pain, fear, head injuries, or mechanical ventilation. Overdoses of salicylates and other toxins can also cause respiratory alkalosis initially and then often progress to metabolic acidosis in later stages. Acute asthma exacerbations, pulmonary embolisms, or other respiratory disorders can initially cause respiratory alkalosis as the lungs breathe faster in an attempt to increase oxygenation, which decreases the $PaCO_2$. After a while, however, these hypoxic disorders cause respiratory acidosis as respiratory muscles tire, breathing slows, and CO_2 builds up in the blood.

Clients experiencing respiratory alkalosis often report feelings of shortness of breath, dizziness or light-headedness, chest pain or tightness, paresthesias, and palpitations as a result of decreased carbon dioxide levels.[8] Respiratory alkalosis is not fatal, but it is important to recognize that underlying conditions such as an asthma exacerbation or pulmonary embolism can be life-threatening, so treatment of these underlying conditions is essential. As the pH level increases, the kidneys will attempt to compensate for the shortage of H^+ ions by reabsorbing HCO_3 before it can be excreted in the urine. This is a slow process, so additional treatment may be necessary.

Treatment of respiratory alkalosis involves treating the underlying cause of the hyperventilation. Acute management of clients who are hyperventilating should focus on client reassurance, an explanation of the symptoms the client is experiencing, removal of any stressors, and initiation of breathing retraining. Breathing retraining attempts to focus the client on abdominal (diaphragmatic) breathing. Read more about breathing retraining in the following box.

8. Schwartzstein, R. M., Richards, J., Edlow, J. A., & Roy-Byrne, P. P. (2020). Hyperventilation syndrome in adults. *UpToDate*. https://www.uptodate.com/contents/hyperventilation-syndrome-in-adults

Breathing Retraining

While sitting or lying supine, the client should place one hand on their abdomen and the other on the chest, and then be asked to observe which hand moves with greater excursion. In hyperventilating clients, this will almost always be the hand on the chest. Ask the client to adjust their breathing so that the hand on the abdomen moves with greater excursion and the hand on the chest barely moves at all. Assure the client that this is hard to learn and will take some practice to fully master. Ask the client to breathe in slowly over four seconds, pause for a few seconds, and then breathe out over a period of eight seconds. After 5 to 10 such breathing cycles, the client should begin to feel a sense of calmness with a reduction in anxiety and an improvement in hyperventilation. Symptoms should ideally resolve with continuation of this breathing exercise.

If the breathing retraining technique is not successful in resolving a hyperventilation episode and severe symptoms persist, the client may be prescribed a small dose of a short-acting benzodiazepine (e.g., lorazepam 0.5 to 1 mg orally or 0.5 to 1 mg intravenously). Current research indicates that instructing clients who are hyperventilating to rebreathe carbon dioxide (CO_2) by breathing into a paper bag can cause significant hypoxemia with significant complications, so this intervention is no longer recommended. If rebreathing is used, oxygen saturation levels should be continuously monitored.[9]

9. Schwartzstein, R. M., Richards, J., Edlow, J. A., & Roy-Byrne, P. P. (2020). Hyperventilation syndrome in adults. *UpToDate*. https://www.uptodate.com/contents/hyperventilation-syndrome-in-adults

Metabolic Acidosis

Metabolic acidosis occurs when there is an accumulation of acids (hydrogen ions) and not enough bases (HCO3) in the body. Under normal conditions, the kidneys work to excrete acids through urine and neutralize excess acids by increasing bicarbonate (HCO3) reabsorption from the urine to maintain a normal pH. When the kidneys are not able to perform this buffering function to the level required to excrete and neutralize the excess acid, metabolic acidosis results.

Metabolic acidosis is characterized by a pH level below 7.35 and an HCO3 level below 22 when reviewing ABGs. It is important to notice that both the pH and HCO3 decrease with metabolic acidosis (i.e., the pH and HCO3 move in the same downward direction). A common cause of metabolic acidosis is diabetic ketoacidosis, where acids called ketones build up in the blood when blood sugar is extremely elevated. Another common cause of metabolic acidosis in hospitalized clients is lactic acidosis, which can be caused by impaired tissue oxygenation. Metabolic acidosis can also be caused by increased loss of bicarbonate due to severe diarrhea or from renal disease that causes decreased acid elimination. Additionally, toxins such as salicylate excess can cause metabolic acidosis.[10]

Nurses may first suspect that a client has metabolic acidosis due to rapid breathing that occurs as the lungs try to remove excess CO2 in an attempt to resolve the acidosis. Other symptoms of metabolic acidosis include confusion, decreased level of consciousness, hypotension, and electrolyte disturbances that can progress to circulatory collapse and death if not treated promptly. It is important to quickly notify the provider of suspected metabolic acidosis so that an ABG can be drawn, and treatment prescribed (based on the cause of the metabolic acidosis) to allow acid levels to improve. Treatment includes IV fluids to improve hydration status, glucose management, and circulatory

10. Emmett, M., & Szerlip, H. (2020). Approach to the adult with metabolic acidosis. *UpToDate*. https://www.uptodate.com/contents/approach-to-the-adult-with-metabolic-acidosis

support. When pH drops below 7.1, IV sodium bicarbonate is often prescribed to help neutralize the acids in the blood.[11,12]

Metabolic Alkalosis

Metabolic alkalosis occurs when there is too much bicarbonate (HCO3) in the body or an excessive loss of acid (H+ ions). Metabolic alkalosis is defined by a pH above 7.45 and an HCO3 level above 26 on ABG results. Note that both pH and HCO3 are elevated in metabolic alkalosis.

Metabolic alkalosis can be caused by gastrointestinal loss of hydrogen ions, excessive urine loss, excessive levels of bicarbonate, or a shift of hydrogen ions from the bloodstream into cells.

Prolonged vomiting or nasogastric suctioning can also cause metabolic alkalosis. Gastric secretions have high levels of hydrogen ions (H+), so as acid is lost, the pH level of the bloodstream increases.

Excessive urinary loss (due to diuretics or excessive mineralocorticoids) can cause metabolic alkalosis due to loss of hydrogen ions in the urine. Intravenous administration of sodium bicarbonate can also cause metabolic alkalosis due to increased levels of bases introduced into the body. Although it was once thought that excessive intake of calcium antacids could cause metabolic alkalosis, it has been found that this only occurs if they are administered concurrently with Kayexelate.[13]

11. U.S. National Library of Medicine. (2023). *Metabolic acidosis: MedlinePlus Medical Encyclopedia*. MedlinePlus. https://medlineplus.gov/ency/article/000335.htm

12. Emmett, M., & Szerlip, H. (2020). Approach to the adult with metabolic acidosis. *UpToDate*. https://www.uptodate.com/contents/approach-to-the-adult-with-metabolic-acidosis

13. Emmett, M., & Szerlip, H. (2020). Causes of metabolic alkalosis. *UpToDate*. https://www.uptodate.com/contents/causes-of-metabolic-alkalosis

Hydrogen ions may shift into cells due to hypokalemia, causing metabolic alkalosis. When hypokalemia occurs (i.e., low levels of potassium in the bloodstream), potassium shifts out of cells and into the bloodstream in an attempt to maintain a normal level of serum potassium for optimal cardiac function. However, as the potassium (K^+) molecules move out of the cells, hydrogen (H^+) ions then move into the cells from the bloodstream to maintain electrical neutrality. This transfer of ions causes the pH in the bloodstream to drop, causing metabolic alkalosis.[14]

A nurse may first suspect that a client has metabolic alkalosis due to a decreased respiratory rate (as the lungs try to retain additional CO_2 to increase the acidity of the blood and resolve the alkalosis). The client may also be confused due to the altered pH level. The nurse should report signs of suspected metabolic alkalosis because uncorrected metabolic alkalosis can result in hypotension and cardiac dysfunction.[15]

Treatment is prescribed based on the ABG results and the suspected cause. For example, treat the cause of the vomiting, stop the gastrointestinal suctioning, or stop the administration of diuretics. If hypokalemia is present, it should be treated. If bicarbonate is being administered, it should be stopped. Clients with kidney disease may require dialysis.[16]

Analyzing ABG Results

Now that we've discussed the differences between the various acid-base

14. Emmett, M., & Szerlip, H. (2020). Causes of metabolic alkalosis. *UpToDate*. https://www.uptodate.com/contents/causes-of-metabolic-alkalosis

15. Brinkman, J. E. (2023). *Physiology, metabolic alkalosis*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK482291/

16. Emmett, M., & Szerlip, H. (2020). Causes of metabolic alkalosis. *UpToDate*. https://www.uptodate.com/contents/causes-of-metabolic-alkalosis

imbalances, let's review the steps to systematically interpret ABG results. Table 15.5b outlines the steps of ABG interpretation.

Table 15.5b Analyzing ABG Results[17,18]

17. Castro, D. (2024). *Arterial blood gas*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK536919/

18. Woodruff, D. W. (2012). *6 easy steps to ABG analysis*. Ed4Nurses, Inc. http://www.profcaseyscudmorern.org/uploads/4/5/0/4/45049193/abgebook.pdf

Step	Action
Step 1: pH (normal 7.35-7.45)	**If pH is out of range, determine if it is acidosis or alkalosis:** • **pH <7.35 is acidosis.** • **pH >7.45 is alkalosis.**
Step 2: PaCO2 (normal 35-45 mmHg)	• **Is the PaCO2 normal?** ◦ **PaCO2 <35 is considered alkalotic.** ◦ **PaCO2 >45 is considered acidotic.** • **If the PaCO2 is abnormal, determine if this is caused by a respiratory problem. Recall that if the imbalance is caused by a respiratory problem, the PaCO2 moves in the opposite direction of the pH:** ◦ **If the pH is <7.35 (acidosis) and the PaCO2 is >45 (acidotic), this is respiratory acidosis.** ◦ **If the pH is >7.45 (alkalosis) and the PaCO2 is <35 (alkalotic), this is respiratory alkalosis.** **If the imbalance does not appear to be caused by a respiratory problem, move on to evaluate the HCO3.

Step 3: HCO3 (normal 22-26)	• **Is the HCO3 normal?** ◦ **HCO3 <22 is considered acidotic.** ◦ **HCO3 >26 is considered alkalotic.** • **If the HCO3 is abnormal, determine if this caused by a metabolic problem. Recall that the HCO3 moves in the same direction as the pH if the imbalance is caused by a metabolic problem:** ◦ **If pH is <7.35 (acidosis) and the HCO3 is <22 (acidotic), this is metabolic acidosis.** ◦ **If the pH is >7.45 (alkalosis) and the HCO3 is >26 (alkalotic), this is metabolic alkalosis.**

Step 4: Determine level of compensation	**After determining the cause of the pH imbalance, determine if compensation is occurring.** • **Fully compensated = the body has fixed the imbalance by bringing the pH back to normal:** ◦ **pH is normal (7.35-7.45).** ◦ **PaCO2 and HCO3 are both out of range.** ◦ **The CAUSE of the disorder is out of range, and the other value is significantly out of range indicating compensation is occurring.** ◦ **Recall the respiratory rate quickly compensates for metabolic disorders, and the kidneys take longer to compensate for respiratory disorders.** • **Partially compensated = the body is working to fix the imbalance but hasn't yet brought the pH back to normal:** ◦ **pH is abnormal (<7.35 or >7.45).** ◦ **PaCO2 and HCO3 are abnormal.** ◦ **The CAUSE of the disorder is out of range and the other value is moving out of range, indicating compensation is occurring.** • **Uncompensated = the body is not yet working to bring the pH back to normal:** ◦ **pH is abnormal (<7.35 or >7.45)** ◦ **PaCO2 or HCO3 is abnormal, but not both.** ◦ **The CAUSE of the disorder is out of range but the other value is not yet out of range, indicating compensation is not yet occurring.**

15.6 Applying the Nursing Process

OPEN RESOURCES FOR NURSING (OPEN RN)

The nursing process is used continuously when caring for individuals who have fluid, electrolyte, or acid-base imbalances, or at risk for developing them because their condition can change rapidly. This systematic approach to nursing care ensures that subtle cues or changes are not overlooked and that appropriate outcomes and interventions are implemented according to the client's current condition.

Assessment

A thorough assessment provides valuable information about a client's current fluid, electrolyte, and acid-base balance, as well as risk factors for developing imbalances. Performing a chart review or focused health history is a good place to start collecting data, with any identified gaps or discrepancies verified during the physical assessment. It is also important to consider pertinent life span or cultural considerations that impact a client's fluid and electrolyte status.

Subjective Assessment

Subjective assessment data is information obtained from the client as a primary source or family members or friends as a secondary source. This information must be obtained by interviewing the client or someone accompanying the client. Some of this information can be obtained through a chart review but should be verified with the client or family member for accuracy.

Subjective data to obtain includes age; history of chronic disease, surgeries,

or traumas; dietary intake; activity level; prescribed medications and compliance with taking medications; pain; and bowel and bladder functioning. Subjective assessment data is helpful to determine normal pattern identification and risk identification. For example, a history of kidney disease or heart failure places the client at risk for fluid volume excess, whereas diuretic use places the client at risk for fluid volume deficit and electrolyte and acid-base imbalances. A history of diabetes mellitus also places a client at risk for fluid, electrolyte, and acid-base imbalances. Recognizing these risks helps nurses be prepared for complications that may arise and allows the nurse to recognize subtle cues as problems develop.

Objective Assessment

Objective assessment data is information that the nurse directly observes. This data is obtained through a physical examination using inspection, auscultation, and palpation. A complete head-to-toe assessment should be performed to avoid missing clues to the client's condition.

Focused assessments such as trends in weight, 24-hour intake and output, vital signs, pulses, lung sounds, skin, and mental status are used to determine fluid balance, electrolyte, and acid-base status.

- Accurate daily weights can provide important clues to fluid balance. Weights must be taken on the same scale, at the same time of day, with the client wearing similar clothing in order to be accurate. A one-kilogram change in weight in 24 hours is considered significant because this represents a one-liter fluid gain or loss and should be reported to the provider.
- Accurate measurement of 24-hour intake and output helps validate weight findings. Averaged urine output of less than 30 mL/hour or 0.5mL/kg/hr should be reported to the provider.
- Vital signs should be analyzed. An elevated blood pressure and bounding pulses are often seen with fluid volume excess. Decreased blood pressure with an elevated heart rate and a weak or thready pulse are hallmark signs of fluid volume deficit. Systolic blood pressure less than 100 mm Hg

in adults, unless other parameters are provided, should be reported to the health care provider.

- Lung crackles can signify fluid volume excess and are often first auscultated in the lower posterior lung fields.
- Tight, edematous, shiny skin can indicate fluid volume excess. See Figure 15.15[1] for an image of edema. Conversely, skin tenting, dry mucous membranes, or dry skin indicate fluid volume deficit. Keep in mind that clients with edema may also be experiencing intravascular fluid volume deficit if too much fluid has leaked into the interstitial space, resulting in signs of hypotension, tachycardia, and weak, thready pulses.
- New mental status changes such as confusion or decreased level of consciousness can indicate fluid, electrolyte, or acid-base imbalance, especially hypo- or hypernatremia, acid-base imbalances, or fluid volume deficit.
- Cardiac arrhythmias can be seen with acid-base imbalances and electrolyte imbalances, especially with hypo- or hyperkalemia and alkalosis. See Table 15.6a for a comparison of expected and unexpected findings and those that require notification of a health care provider.

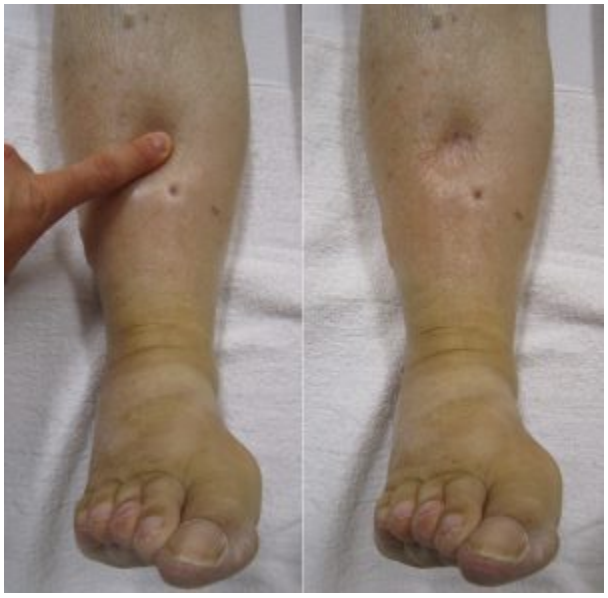

Figure 15.15 Edema

1. "Combinpedal.jpg" by James Heilman, MD is licensed under CC BY-SA 3.0

Table 15.6a Expected Findings Versus Unexpected Findings Indicating a Fluid Imbalance[2]

2. El-Sharkawy, A. M., Sahota, O., Maughan, R. J., & Lobo, D. N. (2014). The pathophysiology of fluid and electrolyte balance in the older adult surgical patient. *Clinical Nutrition, 33*(1), 6-13. https://doi.org/10.1016/j.clnu.2013.11.010

Assessment	Expected Findings	Unexpected Findings Indicating Excessive Fluid Volume *Bolded items are critical conditions that require immediate health care provider notification.	Unexpected Findings Indicating Deficient Fluid Volume *Bolded items are critical conditions that require immediate health care provider notification.
Vital signs	Blood pressure, heart rate, and oxygen saturation levels within normal limits	**Elevated blood pressure, increased respiratory rate,** or **decreased oxygen saturation**	**Decreased blood pressure** or **elevated heart rate**
Neurological	Alert and oriented	Headache	Headache, **confusion, decreased level of consciousness, dizziness,** or weakness
Cardiac	Normal heart rate and rhythm, capillary refill <3 seconds, and normal pulses	Bounding pulses, **S3 heart sound,** or **jugular venous distention**	Weak, thready pulses; sluggish capillary refill; or **chest pain**
Respiratory	Clear lung sounds throughout, normal respiratory rate, and no shortness of breath	**Crackles in lung fields, pink frothy sputum, shortness of breath,** or **respiratory distress**	Shortness of breath possible
Gastrointestinal	Bowel sounds present x4 quadrants and normal stool consistency and frequency for the client		Constipation with dry, hard stools
Urinary	Clear urine, normal urine specific gravity, and urine output greater than 30 ml/hr	**Decreased urine output <30 mL/hr** or **< 0.5 mL/kg/hr concentrated urine**	**Decreased urine output <30 mL/hr** or **<0.5 mL/kg/hr concentrated urine**, or elevated urine specific gravity

Integumentary	Normal skin turgor and moist mucous membranes	Tight, edematous, or shiny skin	Tenting (poor skin turgor); dry, sticky mucous membranes; or dry skin
Weight	<1kg change in weight over 24 hours	>1kg increase over 24 hours	>1kg decrease over 24 hours

Review additional information about assessing body systems in Open RN*Nursing Skills,2e*.

Diagnostic and Lab Work

Diagnostic tests and lab work provide important information about fluid status, electrolyte, and acid-base balance and should be used in conjunction with a thorough subjective and objective assessment to form a complete picture of the client's overall status. It is important to cluster diagnostic and lab assessment data with subjective and objective assessment data to ensure a complete assessment picture. This will help ensure correct information is reported to the provider as necessary.

Lab work provides important clues to overall fluid status. Common lab tests used to evaluate fluid status include serum osmolarity, urine specific gravity, hematocrit, and blood urea nitrogen (BUN).

Serum osmolarity (often interchanged with the term serum osmolality) measures the concentration of particles in the blood with a normal range of 275 to 295 mmol/kg. Normal value ranges may vary slightly among different laboratories. In healthy people, when serum osmolality in the blood becomes high, the body releases antidiuretic hormone (ADH). This hormone causes the kidneys to reabsorb water, resulting in dilution of the blood and the return of serum osmolarity to normal range. An elevated serum osmolarity level means the blood is more concentrated than normal and often indicates deficient

fluid volume deficit. A decreased serum osmolarity means the blood is more dilute than normal and may indicate a fluid volume excess.[3]

Urine osmolarity measures the concentration of particles in the urine. An increased urine osmolarity result means the urine is concentrated and can indicate fluid volume deficit. A decreased urine osmolarity result means the urine is dilute and can indicate excess fluid intake.[4] **Urine specific gravity** is a urine test that commonly measures hydration status by measuring the concentration of particles in urine. Normal urine specific gravity levels are between 1.010 and 1.020. A urine specific gravity above 1.020 indicates concentrated urine and can indicate a fluid volume deficit, similarly to an elevated urine osmolarity. A urine specific gravity below 1.010 indicates dilute urine, which can occur with excessive fluid intake.[5]

When a condition called "*Excessive Fluid Volume*" occurs, it is often the result of altered physiological mechanisms, which impact the kidney's ability to increase urine output to eliminate excessive fluid volume, causing urine output to decrease. As a result, the serum osmolarity decreases as fluid is retained but the urine specific gravity is elevated because urine is concentrated.

Hematocrit (HCT) is a blood test that measures how much of your blood is made up of red blood cells compared to the liquid component of blood called plasma. It is often part of a complete blood count (CBC), a routine test that measures different components of your blood. The normal hematocrit for men is 42 to 52%; for women it is 37 to 47%, but these ranges may vary slightly across laboratories.

3. U.S. National Library of Medicine. (2023). *Osmolality blood test: Medlineplus Medical Encyclopedia*. MedlinePlus. https://medlineplus.gov/ency/article/003463.htm

4. RnCeus.com. (n.d.). *Serum and urine osmolality.* https://www.rnceus.com/renal/renalosmo.html

5. Flasar, C. (2008). What is urine specific gravity? *Nursing2008, 38*(7), 14. https://doi.org/10.1097/01.nurse.0000325315.41513.a0

In addition to measuring red blood cells, hematocrit levels can also be used to evaluate fluid balance. When deficient fluid volume is occurring, the plasma component of the blood also decreases, causing an elevated concentration of red blood cells (and an elevated hematocrit). In this case, drinking more fluid or receiving intravenous fluids will bring the hematocrit level back to normal range. Conversely, if a client is experiencing "*Excessive Fluid Volume*," the plasma component of the blood is increased, causing dilution of the red blood cells and a decreased hematocrit level.[6,7] See Figure 15.16[8] for an illustration of normal hematocrit, elevated hematocrit, and decreased hematocrit due to fluid imbalance.

6. U.S. National Library of Medicine. (2024). *Hematocrit test: MedlinePlus Medical Test*. MedlinePlus. https://medlineplus.gov/lab-tests/hematocrit-test/

7. Billett, H. H. (1990). Hemoglobin and hematocrit. In Walker H. K., Hall W. D., Hurst J. W. (Eds.), *Clinical methods: The history, physical, and laboratory examinations* (3rd ed.). Butterworths. https://www.ncbi.nlm.nih.gov/books/NBK259/

8. "1901_Composition_of_Blood.jpg" by Arabic is licensed under CC BY 3.0

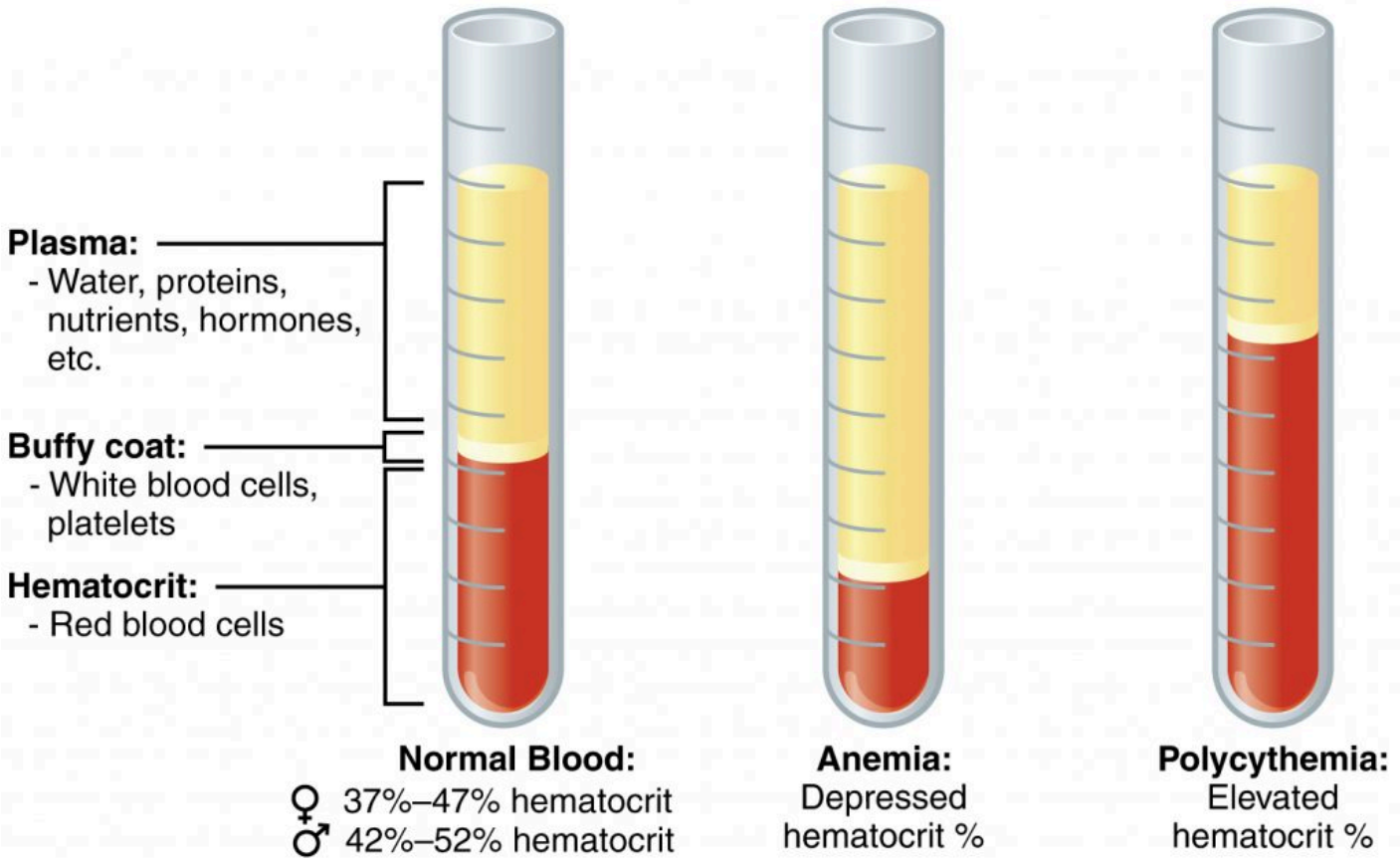

Figure 15.16 Effects of Fluid Imbalance on Hematocrit

Blood Urea Nitrogen (BUN) measures the amount of urea nitrogen in your blood. BUN and serum creatinine levels are used to evaluate kidney function, with increased levels indicating worsening kidney function. In general, the normal BUN range is 7 to 20 mg/dL, but normal ranges vary depending on the reference range used by the lab and the client's age. Clients with "*Deficient Fluid Volume*" can also have elevated BUN levels for the same reason that hematocrit is affected; as plasma levels decrease, the blood becomes more concentrated.

In addition to monitoring lab work for results indicating fluid imbalance, electrolytes, specifically sodium, potassium, calcium, phosphorus, and magnesium, should be monitored closely for clients at risk. Refer to Table 15.4 in the "Electrolytes" section for an overview of electrolyte imbalances, common symptoms, and common treatments.

Additional diagnostic tests used to evaluate for signs of fluid and electrolyte

imbalances are the chest X-ray and the electrocardiogram. A chest X-ray evaluates for fluid in the lungs, a common complication of excessive fluid volume. An electrocardiogram (ECG) evaluates for arrhythmias (e.g., electrical conduction disturbances) in the heart resulting from electrolyte imbalances.

Arterial blood gases (ABGs) are used to closely monitor critically ill clients, such as clients in diabetic ketoacidosis or in severe respiratory distress. ABG results provide important clues about respiratory status, oxygenation, and metabolic processes occurring in the body. See Table 15.6b for a summary of laboratory findings associated with fluid, electrolyte, and acid-base imbalances.

Table 15.6b Lab Values Associated with Fluid and Electrolyte Imbalances

Lab Value	Normal Ranges
Serum osmolarity	275 to 295 mmol/kg
Urine specific gravity	1.010 and 1.020
Hematocrit	Men: 42 to 52% Women: 37 to 47%
BUN	7 to 20 mg/dL
Serum sodium	135-145 mEq/L
Serum potassium	3.5-5 mEq/L
Serum magnesium	1.5-2.4 mEq/L
Serum calcium	8.5-10.3 mg/dL
Serum phosphorus	2.5-4 mg/dL
ABG	pH: 7.35 and 7.45 PaO2: 80-100 mm Hg HCO3: 22-26 mEq/L PaO2: 35-45 mm Hg

Life Span Considerations

There are several life span considerations when assessing for fluid, electrolyte, and acid-base balance.

NEWBORNS AND INFANTS

Newborns and infants have a large proportion of water weight compared to adults, with approximately 75% of weight being water. During the first week after birth, a newborn's weight decreases partly because extracellular fluid is lost in urine along with sodium. Additionally, compensatory mechanisms such as the Renin-Angiotensin-Aldosterone System are less developed, and newborn kidneys are less able to concentrate urine, resulting in a decreased ability to retain sodium. Newborns and infants also have a greater body surface area, making them more susceptible to insensible fluid losses through the skin and lungs via evaporation. This causes increased risk of developing hyponatremia and fluid volume deficit. In contrast, newborns are less able to excrete potassium, placing them at risk for hyperkalemia.[9] Episodes of vomiting and diarrhea also place infants at an increased risk of quickly developing fluid and electrolyte disturbances.

When monitoring urine output in infants, parents are often asked about the number of wet diapers in a day. Nurses may also weigh diapers for hospitalized infants for more accurate measurement of urine output.

CHILDREN AND ADOLESCENTS

Children and adolescents are at risk for dehydration when physically active in hot environments due to excessive sweating. Illnesses causing diarrhea, vomiting, or fever can also quickly cause fluid deficit if there is little fluid intake to replace the water and sodium lost. For this reason, it is important to

9. Ringer, S. (2020). Fluid and electrolyte therapy in newborns. *UpToDate*. https://www.uptodate.com/contents/fluid-and-electrolyte-therapy-in-newborns

educate parents regarding the importance of fluid intake when their child is sweating or ill.[10]

OLDER ADULTS

Older adults are at risk for fluid and electrolyte imbalances for a variety of reasons, including surgery, chronic diseases such as heart and kidney disease, diuretic use, and decreased mobility that limits the ability to obtain hydration. They also have a decreased thirst reflex, which contributes to decreased fluid consumption. Kidney function naturally decreases with age, resulting in decreased sodium and water retention, as well as decreased potassium excretion. These factors place older clients at risk for fluid volume deficit and electrolyte abnormalities.[11]

Diagnoses

There are many nursing diagnoses applicable to fluid, electrolyte, and acid-base imbalances. Review a nursing care planning resource for current NANDA-I approved nursing diagnoses, related factors, and defining characteristics. See Table 15.6c for commonly used NANDA-I diagnoses associated with clients with fluid and electrolyte imbalances.

10. Iglesia, I., Guelinckx, I., De Miguel-Etayo, P. M., González-Gil, E. M., Salas-Salvadó, J., Kavouras, S. A., Gandy, J., Martínez, H., Bardosono, S., Abdollahi, M., Nasseri, E., Jarosz, A., Ma, G., Carmuega, E., Thiébaut, I., & Moreno, L. A. (2015). Total fluid intake of children and adolescents: cross-sectional surveys in 13 countries worldwide. *European Journal of Nutrition, 54*, 57–67. https://doi.org/10.1007/s00394-015-0946-6

11. El-Sharkawy, A. M., Sahota, O., Maughan, R. J., & Lobo, D. N. (2014). The pathophysiology of fluid and electrolyte balance in the older adult surgical patient. *Clinical Nutrition, 33*(1), 6-13. https://doi.org/10.1016/j.clnu.2013.11.010

Table 15.6c Common NANDA-I Nursing Diagnoses Related to Fluid and Electrolyte Imbalances[12]

12. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

NANDA-I Diagnosis	Definition	Selected Defining Characteristics
Excess Fluid Volume	Surplus retention of fluid.	Adventitious breath sounds Elevated blood pressure Altered respiratory pattern Altered mental status Anxiety Decreased hematocrit, serum osmolarity, and BUN Edema Fluid intake exceeds output Hepatomegaly Jugular vein distension Pulmonary congestion Weight gain over short period of time
Deficient Fluid Volume	Decreased intravascular, interstitial, and/or intracellular fluid. This refers to dehydration, water loss alone without change in sodium.	Altered mental status Decreased skin turgor Decreased blood pressure Decreased urine output Dry skin and mucous membranes Increased heart rate Increased serum osmolarity, hematocrit, and BUN Increased urine concentration Sudden weight loss Thirst Weakness
Risk for Imbalanced Fluid Volume	Susceptible to a decrease, increase, or rapid shift from one to the other of intravascular, interstitial, and/or intracellular fluid, which may compromise health.	Altered fluid intake Excessive sodium intake Ineffective medication self-management Malnutrition

Risk for Electrolyte Imbalance	Susceptible to changes in serum electrolyte levels, which may compromise health.	Diarrhea Vomiting Excessive fluid volume Insufficient fluid volume

Excess Fluid Volume Example

A client with heart failure has been hospitalized with an acute exacerbation with dyspnea and increased edema in the lower extremities. A sample PES statement is, *"Fluid Volume Excess related to a compromised regulatory mechanism as evidenced by edema, crackles in lower posterior lungs, and weight gain of 2 kg in 24 hours."*

Deficient Fluid Volume Example

An elderly client develops severe diarrhea due to food poisoning and is admitted to the hospital with dehydration. A sample PES statement is, *"Deficient Fluid Volume related to insufficient fluid intake as evidenced by blood pressure 90/60, dry mucous membranes, decreased urine output, and an increase in hematocrit."*

Risk for Imbalanced Fluid Volume Example

A client who is ten weeks pregnant has developed severe vomiting due to severe morning sickness. A sample PES statement is, *"Risk for Imbalanced Fluid Volume as evidenced by vomiting."* The nurse plans to educate the client about tips to stay hydrated despite vomiting, as well as when to contact the provider if signs of dehydration develop.

Risk for Electrolyte Imbalance Example

A client with chronic kidney disease is prescribed a diuretic to control fluid retention. A sample PES statement is, *"Risk for Electrolyte Imbalance as*

evidenced by insufficient knowledge about modifiable risk factors related to diuretic use." The nurse plans to educate the client about signs and symptoms of fluid and electrolyte imbalance and when to contact the provider.

Note: Recall that risk diagnoses do not contain related factors in PES statements because a vulnerability for a potential problem is being identified for the client. Instead, the phrase "as evidenced by" is used to refer to the evidence of risk that exists. Read more about formulating PES statements in the "Nursing Process" chapter.

Outcome Identification

Goals for a client experiencing fluid, electrolyte, or acid-base imbalances depend on the chosen nursing diagnosis and specific client situation. Typically, goals should relate to resolution of the imbalance. For example, if the nursing diagnosis is *Excess Fluid Volume*, then an appropriate goal would pertain to resolution of the fluid volume excess. Remember that goals are broad, and outcomes should be narrowly focused and written in SMART format (Specific, Measurable, Achievable, Realistic, and Time Oriented).

For the nursing diagnosis of *Excess Fluid Volume*, an overall goal is, *"The client will achieve fluid balance."* Fluid balance for a client with *Excess Fluid Volume* is indicated by body weight returning to baseline with no peripheral edema, neck vein distention, or adventitious breath sounds.[13] An example of a SMART outcome is, *"The client will maintain clear lung sounds with no evidence of dyspnea over the next 24 hours."*

For clients experiencing *Electrolyte Imbalances*, an appropriate goal is, *"The client will maintain serum sodium, potassium, calcium, phosphorus, magnesium, and/or pH levels within normal range."* An additional goal is, *"The client will maintain a normal sinus heart rhythm with regular rate,"*

13. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier. pp. 360-363, 406-416.

because many electrolyte imbalances impact the electrical conduction system of the heart, and this is a life-threatening complication.

Planning Interventions

Evidence-based interventions should be planned according to the client's history and specific fluid, electrolyte, or acid-base imbalance present. Refer to a nursing care planning resource for evidence-based interventions for specific nursing diagnoses. Table 15.6d lists selected interventions for key imbalances.[14,15,16,17,18]

Table 15.6d Interventions for Imbalances

14. Wagner, C. M., Butcher, H. K., & Clarke, M. F. (2024). *Nursing interventions classification (NIC)* (8th ed.). Elsevier.

15. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier. pp. 360-363, 406-416.

16. Fluid overload. (2021). Lippincott advisor. http://advisor.lww.com

17. Dehydration. (2021). Lippincott advisor. http://advisor.lww.com

18. Electrolyte imbalance. (2021). Lippincott advisor. http://advisor.lww.com

Nursing Diagnosis	Interventions
Excess Fluid Volume	• Weigh daily at consistent times and monitor trends. Notify the health care provider for weight gain > 1 kg in 24 hours. • Measure fluid intake and output and monitor 24 hour trends. Notify the health care provider for urine output less than 30 mL/hour, 0.5mL/kg/hour, or as ordered. • Monitor hemodynamic status, including blood pressure, heart rate, and other hemodynamic data available (e.g., MAP and cardiac output). • Monitor respiratory status for signs of pulmonary edema (e.g., increasing anxiety, dyspnea, orthopnea, respiratory rate, and decreasing oxygen saturation (SpO2). Monitor lungs sounds for new or worsening fine crackles and notify the provider of abnormal changes in condition. • Monitor for worsening peripheral edema and notify the provider as indicated. If edema is present, implement interventions such as elevation and compression to manage edema as well as interventions to promote skin integrity. • Monitor lab results relevant to fluid status such as serum osmolarity, urine specific gravity, hematocrit, and BUN. • Elevate the head of the bed to improve ventilation as appropriate. • Administer prescribed diuretics to eliminate excess fluid as appropriate and monitor for effect. Monitor for side effects of diuretics such as orthostatic hypotension and electrolyte imbalances. • Implement prescribed fluid restrictions. For comfort, provide ice chips as appropriate. • Restrict dietary intake of sodium as prescribed. • Educate the client and family members about medications, fluid restrictions, sodium restrictions, and monitoring at home for sudden weight changes, worsening edema, or worsening dyspnea.

Deficient Fluid Volume	• Recognize and address factors that cause deficient fluid volume, such as diarrhea, vomiting, fever, diuretic therapy, or uncontrolled diabetes mellitus. Administer medications such as antidiarrheals and antiemetics as appropriate. • Monitor for signs of deficient fluid volume in clients at risk, including poor skin turgor, delayed capillary refill, weak/thready pulse, severe thirst, dry mucous membranes, and decreased urinary output. • Weigh daily at consistent times and monitor trends. • Measure fluid intake and output and monitor 24 hour trends. Notify the health care provider for urine output less than 30 mL/hour, 0.5mL/kg/hour because this may indicate kidney injury in addition to deficient fluid volume. • Monitor hemodynamic status, including blood pressure, heart rate, and other hemodynamic data available (e.g., MAP and cardiac output) every 15 minutes to one hour for unstable clients and every 4 hours for stable clients. • Monitor for dizziness upon standing and orthostatic blood pressure. Check orthostatic blood pressures with the client lying and standing. To perform this procedure, have the client lie down for five minutes. Measure the blood pressure (BP) and pulse rate. Have the client stand. Repeat the BP and pulse rate measurements after standing one to three minutes. A decrease in systolic blood pressure ≥ 20 mm Hg or a decrease in diastolic blood pressure ≥ 10 mm Hg, or if the client reports feeling light-headed or dizzy is considered abnormal.[19] Orthostatic hypotension should be reported to the provider and safety measures implemented to prevent falls. • Monitor lab results relevant to fluid status such as serum osmolarity, urine specific gravity, hematocrit, and BUN. • Encourage oral fluid intake, as tolerated. Offer beverages the client prefers every 1 to 2 hours while awake and keep within easy reach, unless contraindicated. • Minimize intake of drinks with diuretic or laxative effects (e.g., coffee, tea, alcohol, prune juice). • Administer prescribed IV fluids and monitor the client's response. Generally, isotonic fluids are prescribed for extracellular rehydration

19. Centers for Disease Control and Prevention. (2017). M*easuring orthostatic blood pressure*. cdc.gov/steadi/pdf/Measuring_Orthostatic_Blood_Pressure-print.pdf

	and hypotonic fluids are prescribed for intracellular rehydration. Monitor for the potential development of excessive fluid volume or pulmonary edema during IV rehydration. • Recognize and report signs of impending hypovolemic shock, including elevated pulse and respirations; decreased blood pressure below baseline; cold, clammy skin; weak, thready pulse; and confusion. Clients progressing towards hypovolemic shock require emergent care. • Educate the client and family members about signs of dehydration to watch for at home. Remind older adults that thirst sensation often decreases with age.
Risk for Electrolyte Imbalance	• Recognize potential causes of altered electrolyte levels, such as diuretic therapy, kidney disease, gastrointestinal fluid loss, drainage from wounds or burns, and excessive perspiration. Notify the health care provider of suspected electrolyte imbalances and address causes. • Monitor mental status, vital signs, and heart rhythm at least every eight hours or more frequently as needed. Electrolyte imbalances can cause confusion, cardiac dysrhythmias, muscle weakness, edema, and respiratory failure. • Monitor associated laboratory results and report abnormal findings to the provider. • Administer oral and IV electrolyte supplements as prescribed for electrolyte deficiencies. • Limit dietary intake of specific electrolyte excesses. • Administer electrolyte-binding medications, such as Kayexalate for hyperkalemia, as prescribed. • Administer IV fluids to promote renal excretion of excess electrolyte levels, as prescribed. • Educate the client and family members about dietary choices corresponding to the specific electrolyte imbalance. Provide information about monitoring for potential electrolyte imbalances at home resulting from their medications.

- Read more about diuretic medications that affect fluid and electrolyte balance in the "Cardiovascular and Renal System" chapter in Open RN *Nursing Pharmacology, 2e*.
- Read about intravenous fluids used to treat *Fluid Volume Deficit* in the "IV Therapy Management" chapter in Open RN *Nursing Skills, 2e*.

Implement Interventions Safely

Clients with fluid and electrolyte imbalances can quickly move from one imbalance to another based on treatments received. It is vital to reassess a client before implementing interventions to ensure current status warrants the prescribed intervention. For example, a client admitted with *Fluid Volume Deficit* received intravenous fluids (IV) over the past 24 hours. When the nurse prepares to administer the next bag of IV fluids, she notices the client has developed pitting edema in his lower extremities. She listens to his lungs and discovers crackles. The nurse notifies the prescribing provider, and the order for intravenous fluids is discontinued and a new order for diuretic medication is received.

Assessments for new or worsening imbalances should be performed prior to implementing interventions[20]:

- Monitor daily weights for sudden changes. A weight change of greater than 1 kg in 24 hours (using the same scale and type of clothing) should be reported to the provider.
- Monitor location and extent of edema using the 1+ to 4+ scale to quantify

20. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier. pp. 360-363, 406-416.

edema.

- Monitor intake and output over a 24-hour period; note trends of decreasing urine output in relation to fluid intake indicating potential development of *Fluid Volume Excess*.
- Monitor lab work such as serum osmolarity, serum sodium, BUN, and hematocrit for abnormalities. (For example, a client receiving IV fluids may develop *Fluid Volume Excess*, resulting in decreased levels of serum osmolarity, serum sodium, BUN, and hematocrit. Conversely, a client receiving IV diuretics can quickly become dehydrated, resulting in elevated levels of serum osmolarity, serum sodium, BUN, and hematocrit.)
- For clients receiving intravenous fluids, monitor for the development of excessive fluid volume. Monitor lung sounds for crackles and ask about the presence of dyspnea. Report new abnormal findings to the provider.
- For clients receiving diuretic therapy, monitor for fluid volume deficit and electrolyte imbalances such as hypokalemia and hyponatremia.

Implement fall precautions for clients with orthostatic hypotension, restlessness, anxiety, or confusion related to fluid imbalances.

Evaluation

The effectiveness of interventions implemented to maintain fluid balance must be continuously evaluated. Evaluation helps the nurse determine whether goals and outcomes are met and if interventions are still appropriate for the client. If outcomes and goals are met, the plan of care can likely be discontinued. If outcomes and goals are not met, they may need to be revised. It is also possible that interventions may need to be added or revised to help the client meet their goals and outcomes. Table 15.6e provides a list of assessment findings indicating imbalances are improved.

Table 15.6e Evaluating for Improvement of Imbalances

Imbalance	Signs and Symptoms of Improvement
Fluid Volume Excess	Decreased crackles, decreased edema, decreased shortness of breath, and/or improved jugular venous distention
Fluid Volume Deficit	Increased blood pressure, decreased heart rate, normal skin turgor, and/or moist mucous membranes
Electrolyte Imbalances	Electrolyte levels return to normal and/or absence of signs or symptoms of deficit or excess
Acid-Base Imbalance	ABGs return to normal or baseline, resolution of vomiting or diarrhea, and/or no respiratory distress

15.7 Putting It All Together

Client Scenario

Mr. Hernandez is a 54-year-old client admitted to the medical telemetry floor with a diagnosis of heart failure exacerbation. He tells the nurse, “My breathing has gotten worse the past last three days and I have a lot of swelling in my feet.”

Applying the Nursing Process

Assessment: Vital signs at the start of shift were blood pressure 154/94, heart rate 88, respiratory rate 24, and oxygen saturation 88%. On assessment, the nurse finds fine crackles in bilateral posterior lower lung bases, an S3 heart sound, and 2+ pitting edema in bilateral lower extremities midway to the knee. The nurse reviews the client’s chart and discovers Mr. Hernandez has gained ten pounds since his previous office visit last week.

Based on the assessment information that has been gathered, the nurse creates the following nursing care plan for Mr. Hernandez:

Nursing Diagnosis: *Excess Fluid Volume related to compromised regulatory mechanism as evidenced by fine crackles in bilateral posterior lung bases, S3 heart sound, weight gain of 10 pounds in the past week, and the client states, “My breathing has gotten worse the past last three days and I have a lot of swelling in my feet.”*

Overall Goal: *The client will demonstrate stabilization in fluid volume.*

SMART Expected Outcomes:

- *Mr. Hernandez’s vital signs and weight will return to his baseline in the next 48 hours.*
- *Mr. Hernandez will verbalize three rules of dietary and fluid restriction to follow at home following his educational session.*

Planning and Implementing Nursing Interventions:

The nurse will weigh the client daily and analyze weight trends and 24-hour intake and output. The nurse will closely monitor lung sounds, respiratory rate, and oxygenation status. The nurse will establish a 24-hour schedule for fluid intake and educate the client regarding fluid restriction. The nurse will closely monitor lab results, especially sodium and potassium, and monitor for symptoms of fluid shifts. The nurse will provide health teaching regarding fluid and sodium restrictions.

Sample Documentation:

The client was admitted with acute heart failure exacerbation and stated, "My breathing has gotten worse the past last three days and I have a lot of swelling in my feet." On admission to the unit at 0900, vital signs were blood pressure 154/94, heart rate 88, respiratory rate 24, and oxygen saturation 88%. Fine crackles were present in bilateral posterior lower lung bases, an S3 heart sound was present, and there was 2+ pitting edema in bilateral lower extremities midway to the knee. The chart indicates he has gained ten pounds since his previous office visit last week. Provider orders and fluid restrictions were implemented. Lab results are within normal ranges. Client education regarding fluid and sodium restrictions and a handout were provided. At the end of the session, Mr. Hernandez was able to report back three rules of dietary and fluid restrictions to follow at home when discharged.

Evaluation:

By the end of the shift, the second SMART outcome was "met" when Mr. Hernandez was able to report back three rules of dietary and fluid restrictions after the client education session. The first SMART outcome was not yet met but will be reevaluated every shift for the next 24 hours.

15.8 Learning Activities

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Activities

(Answers to "Learning Activities" can be found in the "Answer Key" at the end of the book. Answers to interactive activity elements will be provided within the element as immediate feedback.)

Scenario A

Mr. Smith, a 60-year-old male, was admitted to the general medical floor with a diagnosis of an exacerbation of heart failure. See Figure 15.17 for an image of Mr. Smith.[1] He has a past medical history of hypertension and coronary artery disease. His admitting weight was 225 pounds. His baseline weight from a previous clinic visit was 210 pounds. On admission, he had fine crackles throughout his lower posterior lobes and 4+ pitting edema in his lower extremities. His ABG results on admission were pH 7.30, PaCO2 50 mmHg, PaO2 80 mm Hg, HCO3- 27 mEq/L, and SaO2 85%.

1. "HF-RTD.JPG" by ARISE project is licensed under CC BY 4.0

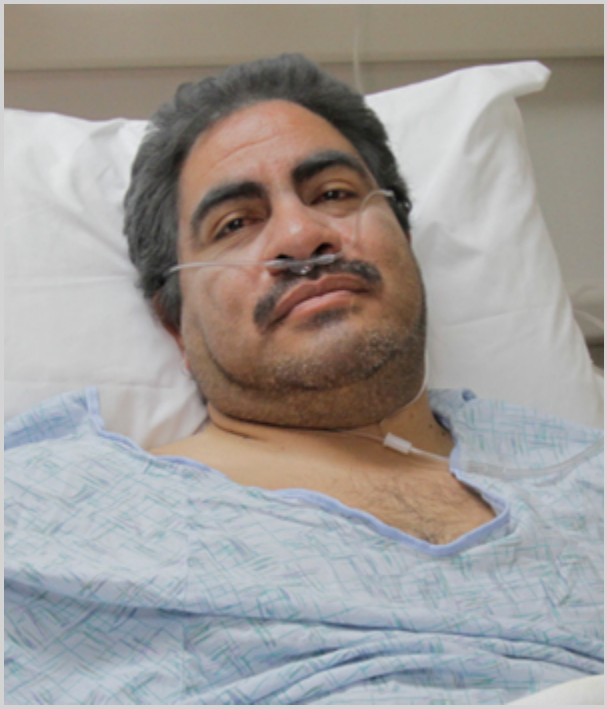

Figure 15.17 Mr. Smith

Questions

1. Interpret Mr. Smith's ABG results on admission.

2. Explain the likely cause of the ABG results.

3. Create a nursing diagnosis for Mr. Smith's fluid status in PES format based on his admission data.

Mr. Smith has received multiple doses of IV diuretics over the past three days since admission. During your morning assessment, Mr. Smith tells you he very thirsty and feels dizzy. You notice he is irritable and is becoming increasingly confused. You quickly obtain his vital signs: BP 85/45, HR 110, RR 24/minute, O2 saturation 98% on 2L/min per nasal cannula, and temperature 37.2 degrees Celsius. His lung sounds are clear, and his heart sounds are regular sinus rhythm. You notice his weight this morning was 205 pounds. You call the provider and receive orders for STAT basic metabolic

panel and to initiate 0.9% Normal Saline IV fluids at 250 mL/hour until the provider arrives to evaluate the client.

The basic metabolic panel results (with the lab's normal reference range in parentheses) are as follows:

Sodium: 155 mEq/L (135-145)
Potassium: 3.3 mEq/L (3.5-5.3)
Chloride: 103 mEq/L (98-108)
Carbon dioxide: 25 mEq/L (23-27)
Blood urea nitrogen (BUN): 30 mg/dL (10-25)
Creatinine: 1.9 mg/dL (0.5-1.5)
Glucose: 100 mg/dL (fasting 70-99)

Questions

4. What is Mr. Smith's fluid balance this morning? Support your answer with data.

5. What is the probable cause of his fluid balance?

6. Interpret Mr. Smith's lab results. What are the potential causes of these results?

7. Create a nursing diagnosis statement in PES format for Mr. Smith's current fluid status.

8. Create a new expected outcome in SMART format for Mr. Smith.

9. In addition to providing intravenous fluids, what additional interventions will you implement for Mr. Smith?

10. How will you evaluate if the nursing interventions are effective?

Scenario B

A 74-year-old male, Mr. M., was admitted to the general medical floor during the night shift with a diagnosis of

pneumonia. See Figure 15.18 for an image of Mr. M.[2] He has a past medical history of alcohol abuse and coronary artery disease. You are the day shift nurse, and during your morning assessment, you notice that Mr. M. becomes increasingly lethargic and is not following commands consistently. You obtain the following vital signs: BP 80/45, HR 110, RR 8 and labored, O2 saturation 80% on 3L per nasal cannula, and temperature 38.1 degrees Celsius. His lung sounds reveal coarse crackles throughout, and you notice he is using accessory muscles with breathing. You notify the provider using an SBAR report and receive orders to increase oxygen to 10L per non-rebreather mask.

Figure 15.18 Mr. M.

Lab results are ordered with the following results:

2. "Hospitalized Male" by ARISE project is licensed under CC BY 4.0

ABGs: pH 7.30, $PaCO_2$ 50, PaO_2 59, HCO_3 24, SaO_2 80

Potassium: 5.9 mEq/L
Magnesium: 1.0 mEq/L
Calcium: 10.2 mg/dL
Sodium: 137 mEq/L
Hematocrit: 55%
Serum Osmolarity: 305 mmol/kg
BUN: 30 mg/dL
Urine Specific Gravity: 1.025

Questions

1. What is Mr. M.'s fluid balance? Provide data supporting the imbalance.

2. What is your interpretation of Mr. M.'s ABGs?

3. What is your interpretation of Mr. M.'s electrolyte studies?

4. Is Mr. M. stable or unstable? Why?

5. For what complications will you monitor?

6. Write an SBAR communication you would have with the health care provider to notify them about Mr. M.'s condition.

7. Create a NANDA-I diagnosis for Mr. M. in PES format.

8. Identify an expected outcome for Mr. M. in SMART format.

9. What interventions will you plan for Mr. M.?

10. How will you evaluate if your interventions are effective?

11. Write a nursing note about Mr. M.'s condition and your actions taken. This can be in the form of a DAR, SOAP, or summary nursing note.

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1430#h5p-93

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1430#h5p-31

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1430#h5p-32

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1430#h5p-86

- Test your knowledge using this NCLEX Next Generation-style bowtie question. You may reset and resubmit your answers to this question an unlimited number of times.[3]

- Test your knowledge using these NCLEX Next Generation-style questions. You may reset and resubmit your answers to the questions in this assignment an unlimited number of times.[4]

3. "Chapter 15 Assignment 1" by Tami Davis for OpenRN is licensed under CC BY-NC 4.0

4. "Chapter 15 Assignment 2" by Rebecca Wicks for OpenRN is licensed under CC BY-NC 4.0

XV Glossary

OPEN RESOURCES FOR NURSING (OPEN RN)

Active transport: Movement of solutes and ions across a cell membrane against a concentration gradient from an area of lower concentration to an area of higher concentration using energy during the process. (Chapter 15.2)

Chvostek's sign: An assessment sign of acute hypocalcemia characterized by involuntary facial muscle twitching when the facial nerve is tapped. (Chapter 15.4)

Diffusion: The movement of solute particles from an area of higher concentration to an area of lower concentration. (Chapter 15.2)

Edema: Swelling caused by excessive interstitial fluid retention. (Chapter 15.2)

Extracellular fluids (ECF): Fluids found outside cells in the intravascular or interstitial spaces. (Chapter 15.2)

Filtration: Movement of fluids through a permeable membrane utilizing hydrostatic pressure. (Chapter 15.2)

Hydrostatic pressure: The pressure that a contained fluid exerts on what is confining it. (Chapter 15.2)

Hypercapnia: Elevated levels of retained carbon dioxide in the body. (Chapter 15.5)

Hypertonic solution: Intravenous fluids with a higher concentration of dissolved particles than blood plasma. (Chapter 15.3)

Hypervolemia: Excess intravascular fluid. Used interchangeably with "excessive fluid volume." (Chapter 15.3)

Hypotonic solution: Intravenous fluids with a lower concentration of dissolved particles than blood plasma. (Chapter 15.3)

Hypovolemia: Intravascular fluid loss. Used interchangeably with "deficient fluid volume" and "dehydration." (Chapter 15.2)

Interstitial fluids: Fluids found between the cells and outside of the vascular system. (Chapter 15.2)

Intracellular fluids (ICF): Fluids found inside cells consisting of protein, water, and electrolytes. (Chapter 15.2)

Intravascular fluids: Fluids found in the vascular system consisting of the body's arteries, veins, and capillary networks. (Chapter 15.2)

Isotonic solution: Intravenous fluids with a similar concentration of dissolved particles as blood plasma. (Chapter 15.3)

Oncotic pressure: Pressure inside the vascular compartment created by protein content of the blood (in the form of albumin) that holds water inside the blood vessels. (Chapter 15.2)

Osmolality: Proportion of dissolved particles in a specific weight of fluid. (Chapter 15.2)

Osmolarity: Proportion of dissolved particles or solutes in a specific volume of fluid. (Chapter 15.2, Chapter 15.3)

Osmosis: Movement of fluid through a semipermeable membrane from an area of lesser solute concentration to an area of greater solute concentration. (Chapter 15.2)

Passive transport: Movement of fluids or solutes down a concentration gradient where no energy is used during the process. (Chapter 15.2)

Renin-Angiotensin-Aldosterone System (RAAS): A body system that regulates extracellular fluids and blood pressure by regulating fluid output and electrolyte excretion. (Chapter 15.2)

Transcellular fluid: Fluid in areas such as cerebrospinal, synovial, intrapleural, and gastrointestinal system. (Chapter 15.2)

Trousseau's sign: A sign associated with hypocalcemia that causes a spasm of the hand when a blood pressure cuff is inflated. (Chapter 15.4)

Urine specific gravity: A measurement of hydration status that measures the concentration of particles in urine. (Chapter 15.6)

PART XVI

ELIMINATION

16.1 Elimination Introduction

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Objectives

- Describe risk factors for urinary and bowel elimination
- Identify cues related to alterations in elimination across the life span
- Identify diagnostic tests indicative of disturbances in urinary and bowel elimination
- Identify measures to promote urinary and bowel elimination
- Contribute to a plan of care for clients with an alteration in urinary and bowel elimination

After ingesting food and fluids, our body eliminates waste products through the urinary system and the gastrointestinal system. Nurses provide care for clients with commonly occurring elimination alterations, including urinary tract infections, urinary incontinence, urinary retention, constipation, diarrhea, and bowel incontinence. This chapter will provide an overview of these alterations and the associated nursing care.

16.2 Basic Concepts

OPEN RESOURCES FOR NURSING (OPEN RN)

Let's begin by reviewing the basic anatomy and physiology of the urinary and gastrointestinal systems.

Urinary System

The urinary system, also referred to as the renal system or urinary tract, consists of the kidneys, ureters, bladder, and urethra. The purpose of the urinary system is to eliminate waste from the body, regulate blood volume and blood pressure, control levels of electrolytes and metabolites, and regulate blood pH. The kidneys filter blood in the nephrons and remove waste in the form of urine. Urine exits the kidney via the ureters and enters the urinary bladder, where it is stored until it is expelled by urination (also referred to as voiding).[1] See Figure 16.1[2] for an image of the male urinary system. The female urinary system is similar except for a smaller urethra.

1. National Institute of Diabetes and Digestive and Kidney Diseases. (2020). *The urinary tract & how it works*. U.S. Department of Health and Human Services. https://www.niddk.nih.gov/health-information/urologic-diseases/urinary-tract-how-it-works

2. "Urinary_System_(Male).png" by BruceBlaus is licensed under CC BY-SA 4.0

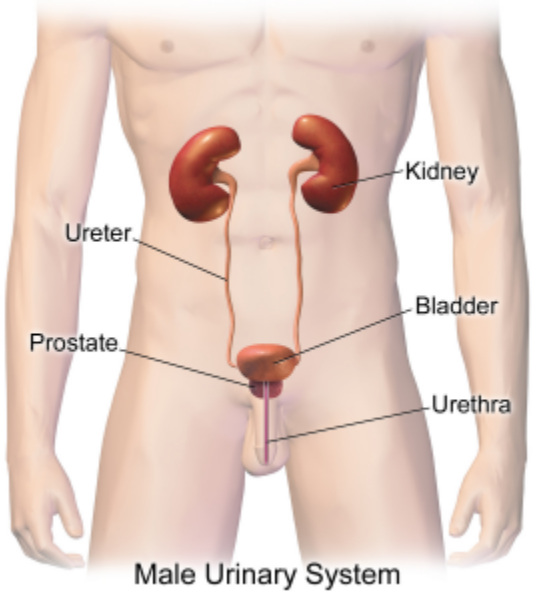

Figure 16.1 Male Urinary System

A healthy adult with normal kidney function produces 800-2,000 mL of urine per day, depending on fluid intake, as well as the amount of fluid lost through sweating and breathing. The bladder typically holds about 360-480 mL of urine. As the bladder fills, it sends signals to the brain that it is time to urinate. The urinary tract includes two sets of muscles that work together as a sphincter, closing off the urethra to keep urine in the bladder until the brain sends signals to urinate. Urination occurs when the brain sends signals to the wall of the bladder to contract and squeeze urine out of the bladder and through the urethra. Frequency of urination depends on how quickly the kidneys produce urine and how much urine a person's bladder can comfortably hold.[3]

Normal urine should be clear, pale to light yellow in color, and not foul-smelling. However, some foods or medications may change the smell or color

3. National Institute of Diabetes and Digestive and Kidney Diseases. (2020). *The urinary tract & how it works*. U.S. Department of Health and Human Services. https://www.niddk.nih.gov/health-information/urologic-diseases/urinary-tract-how-it-works

of urine. For instance, phenazopyridine (Pyridium), a common medication prescribed to treat the pain, frequency, and burning associated with urinary tract infections, can cause urine to appear orange.[4]

Nurses frequently monitor and document a client's urine output as part of the overall plan of care. It can be collected by placing a collection hat in the client's toilet and then measured in a graduated cylinder. If the client has an indwelling catheter, the urine is emptied every shift from the catheter bag and measured in a graduated cylinder. For infants and toddlers, the number of daily wet diapers provides a general measure of urine output. For more specific measurement of urine output during hospitalization, wet diapers are weighed.

Terms commonly used to document conditions related to the urinary tract are as follows:

- **Anuria:** Absence of urine output, typically found during kidney failure, defined as less than 50 mL of urine over a 24-hour period.
- **Dysuria:** Painful or difficult urination.
- **Frequency:** The need to urinate several times during the day or at night (nocturia) in normal or less-than-normal volumes. It may be accompanied by a feeling of urgency.[5]
- **Hematuria:** Blood in the urine, either visualized or found during microscopic analysis.
- **Oliguria:** Decreased urine output, defined as less than 500 mL of urine in adults in a 24-hour period. In hospitalized clients, oliguria is further defined as less than 0.5 mL of urine per kilogram per hour for adults and

4. National Institutes of Health. (2019). *Pyridium*. DailyMed. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=165d01d4-a9f7-2293-e054-00144ff8d46c

5. Maddukuri, G. (2021). *Urinary frequency*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/genitourinary-disorders/symptoms-of-genitourinary-disorders/urinary-frequency

children or less than 1 mL of urine per kilogram per hour for infants.[6] New oliguria should be reported to the health care provider because it can indicate dehydration, fluid retention, or decreasing kidney function.

- **Nocturia:** The need to get up at night on a regular basis to urinate. Nocturia often causes sleep deprivation that affects a person's quality of life.[7]
- **Polyuria:** Greater than 2.5 liters of urine output over 24 hours, also referred to as diuresis. Urine is typically clear with no color.[8] New polyuria should be reported to the health care provider because it can be a sign of many medical conditions.
- **Pyuria:** At least ten white blood cells in each cubic millimeter of urine in a urine sample, typically indicating infection. In severe infections, pus may be visible in the urine.[9] See Figure 16.2[10] for an image of pyuria for a client with urosepsis.
- **Urgency:** A sensation of an urgent need to void.[11] Urgency can cause urge

6. Berry, C. (2020). *Oliguria*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/critical-care-medicine/approach-to-the-critically-ill-patient/oliguria

7. Leslie, S. W. (2024). *Nocturia*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK518987/

8. U.S. National Library of Medicine. (2023). *Urination – excessive amount*. MedlinePlus. https://medlineplus.gov/ency/article/003146.htm

9. Cherney, K. (2018). *Everything you should know about pyuria*. Healthline. https://www.healthline.com/health/pyuria

10. "Pyuria2011.JPG" by James Heilman, MD is licensed under CC BY-SA 3.0

11. Maddukuri, G. (2021). *Urinary frequency*. Merck Manual Professional Version. https://www.merckmanuals.com/professional/genitourinary-disorders/symptoms-of-genitourinary-disorders/urinary-frequency

incontinence if the client is not able to reach the bathroom quickly.

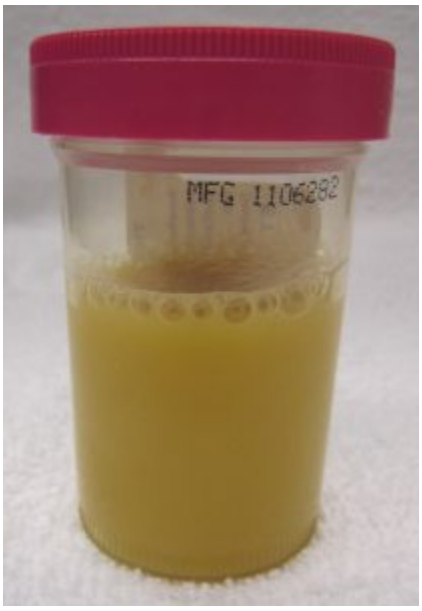

Figure 16.2 Pyuria

- Read more details about the renal system in the "Review of Basic Concepts" section in the "Cardiovascular and Renal System" chapter in Open RN *Pharmacology, 2e*.
- View an activity reviewing the Vascular System of the Kidneys.

Gastrointestinal System

The gastrointestinal (GI) system includes the mouth, esophagus, stomach, small intestine, large intestine, and anus. See Figure 16.3[12] for an image of the gastrointestinal system. Ingested food and liquid are pushed through the GI tract by **peristalsis**, the involuntary contraction and relaxation of muscle creating wave-like movements of the intestines. The stomach mixes food and

12. "Blausen_0316_DigestiveSystem.png" by Blausen.com staff is licensed under CC BY 3.0

liquid with digestive enzymes and then empties into the small intestine. The muscles of the small intestine mix food with enzymes and bile from the pancreas, liver, and intestine and push the mixture forward for further digestion. Bacteria in the GI tract, called normal flora or microbiome, also assist with digestion. The walls of the small intestine absorb water and the digested nutrients into the bloodstream. As peristalsis continues, the waste products of the digestive process move into the large intestine. The large intestine absorbs water and changes the waste from liquid into stool. The rectum, at the lower end of the large intestine, stores stool until it is pushed out of the anus during a bowel movement.[13]

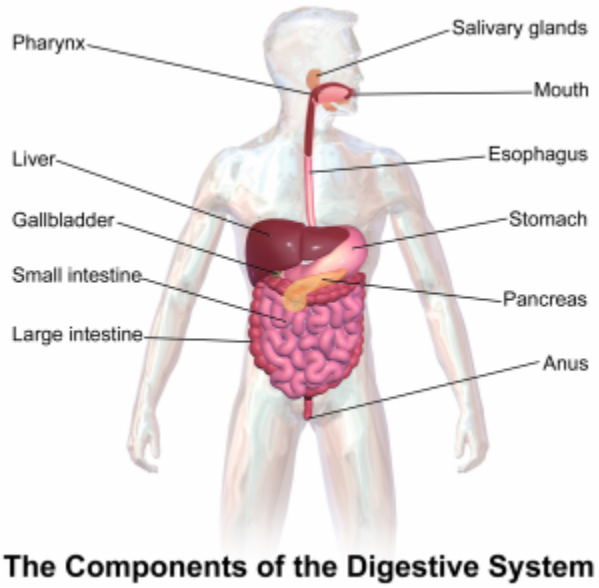

Figure 16.3 Gastrointestinal System

This section will focus on common alterations in bowel elimination, including constipation, diarrhea, and bowel incontinence. These alterations are

13. National Institute of Diabetes and Digestive and Kidney Diseases. (2017). *Your digestive system & how it works*. U.S. Department of Health and Human Services. https://www.niddk.nih.gov/health-information/digestive-diseases/digestive-system-how-it-works

common symptoms of several diseases and conditions of the gastrointestinal system. Nurses provide care to help manage these alterations.

Terms related to alterations in bowel elimination include the following:

- **Black stools:** Black-colored stools can be side effects of iron supplements or bismuth subsalicylate (Pepto-Bismol).
- **Rectal bleeding:** Rectal bleeding refers to bright red blood in the stools, also referred to as hematochezia. It is a sign of bleeding from the lower GI tract. Rectal bleeding can range in severity from minimal drops of blood on the toilet tissue caused by hemorrhoids to severe bleeding in large amounts that are life-threatening and require emergency care.[14] New bleeding should always be reported to the health care provider.
- **Tarry stools:** Stools that are black, sticky, and appear like tar are referred to as **melena**. Melena is typically caused by bleeding in the upper part of the gastrointestinal tract, such as the esophagus, stomach, or the first part of the small intestine, or due to the client swallowing blood. The blood appears darker and tarry-looking because it undergoes digestion on its way through the GI tract.[15] Bleeding from the upper part of the GI tract can also range from mild to life-threatening, depending upon the cause, and should always be reported to the health care provider.

Review information about digestion in the "Nutrition"

14. U.S. National Library of Medicine. (2024). *Rectal bleeding*. MedlinePlus. https://medlineplus.gov/ency/article/007741.htm

15. U.S. National Library of Medicine. (2024). *Black or tarry stools*. MedlinePlus. https://medlineplus.gov/ency/article/003130.htm#:~:text=Black%20or%20tarry%20stools%20with,used%20to%20describe%20this%20finding

chapter or read more information about the "Gastrointestinal" system in Open RN *Nursing Pharmacology, 2e*.

Newborns and Infants

Meconium refers to the first bowel movement of a newborn that appears sticky and black to dark green in color. See Figure 16.4[16] for an image of meconium. The stool of a breastfed baby usually appears like a curdled yellow, while that of a formula-fed baby is pastier. Breastfed babies often have bowel movements after every feeding. Formula-fed babies tend to have fewer bowel movements.

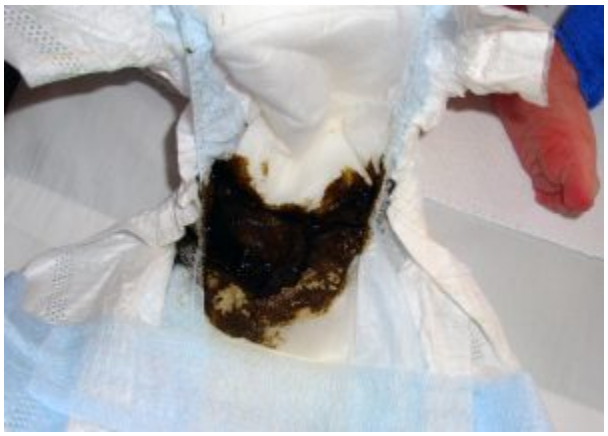

Figure 16.4 Meconium

Toddlers

Toddlers usually begin the process of toilet training between two and three

16. Meconium_Diaper.jpg" by Azoreg is licensed under CC BY-SA 3.0

years old. **Enuresis** is the term used to describe incontinence when sleeping (i.e., bed-wetting). Enuresis in children is considered normal unless it continues past seven or eight years of age, when it should be addressed with a pediatrician. Toddlers often have undigested food in their bowel movements due to the intestinal system not fully digesting some foods, such as corn or grapes.

Children

School-aged children may be at risk for developing constipation due to delaying bowel movements during school times until they are in the privacy of their homes. The longer the stool sits in the colon, the more water is absorbed by the intestines, and the harder stool becomes to pass.

Adults

Adult females often develop urinary incontinence related to pregnancy and delivery, menopause, or vaginal hysterectomy. Adult males may have urgency and urinary retention with possible overflow urinary incontinence as their prostate enlarges. Adults over the age of 30 may develop nocturia.

Older Adults

Peristalsis typically slows as aging occurs. Older adults should be encouraged to increase fluids, fiber, and activity, as appropriate, to prevent constipation. If a client is not able to meet the goal of a bowel movement with soft, formed stools every three days, then a bowel management program should be initiated.

Now that we have reviewed the basic structure and function of the urinary and gastrointestinal systems, let's review the common alterations of urinary tract infection, urinary incontinence, urinary retention, constipation, diarrhea, and bowel incontinence in the following sections.

16.3 Urinary Tract Infection

OPEN RESOURCES FOR NURSING (OPEN RN)

A urinary tract infection (UTI) is a common infection that occurs when bacteria, typically from the rectum, enter the urethra and infect the urinary tract. Infections can affect several parts of the urinary tract, but the most common type is a bladder infection (cystitis). Kidney infections (pyelonephritis) are more serious than a bladder infection because they can have long-lasting effects on the kidneys.[1]

Some people are at higher risk of getting a UTI. UTIs are more common in females because their urethras are shorter and closer to the rectum, which makes it easier for bacteria to enter the urinary tract. Other factors that can increase the risk of UTIs include the following[2]:

- A previous UTI
- Sexual activity, especially with a new sexual partner
- Pregnancy
- Age (Older adults and young children are at higher risk. Refer to the "Care of the Older Adult" chapter for more details about older adults.)
- Structural problems in the urinary tract, such as prostate enlargement

Symptoms of a UTI include the following[3]:

1. Centers for Disease Control and Prevention. (2024). *Urinary tract infection.* https://www.cdc.gov/uti/about/
2. Centers for Disease Control and Prevention. (2024). *Urinary tract infection.* https://www.cdc.gov/uti/about/
3. Centers for Disease Control and Prevention. (2024). *Urinary tract infection.* https://www.cdc.gov/uti/about/

- Pain or burning while urinating (dysuria)
- Frequent urination (frequency)
- Urgency with small amounts of urine
- Bloody urine
- Pressure or cramping in the groin or lower abdomen
- Confusion or altered mental status in older adults

Symptoms of a more serious kidney infection (pyelonephritis) include fever above 101 degrees F (38.3 degrees C), shaking chills, lower back pain or flank pain (i.e., on the sides of the back), and nausea or vomiting.[4] It is important to remember that older adults with a UTI may not exhibit these symptoms but often demonstrate an increased level of confusion. Sometimes UTIs can spread to the blood (septicemia), leading to life-threatening infection called sepsis. Read more about sepsis in the "Infection" chapter.

When a client presents with symptoms of a UTI, the provider will order diagnostic tests, such as a urine dip, urinalysis, or urine culture. Read more about diagnostic tests in the "Assessment" section of the "Nursing Process" chapter.

Interventions

Antibiotics are prescribed for urinary tract infections. Nurses provide important health teaching to clients with a UTI, such as the importance of finishing their antibiotic therapy as prescribed, even if they begin to feel better after a few days, to minimize the risk of developing antibiotic-resistant microorganisms. Clients should also be encouraged to drink extra fluids to help flush bacteria from the urinary tract. Additional health teaching regarding preventing future UTIs includes the following[5]:

4. Centers for Disease Control and Prevention. (2024). *Urinary tract infection.* https://www.cdc.gov/uti/about/

5. Centers for Disease Control and Prevention. (2024). *Urinary tract infection*

- Urinate after sexual activity to flush bacteria away from the urethra.
- Stay well-hydrated and urinate regularly.
- Take showers instead of baths to minimize irritation and bacterial contamination of the urethra.
- Minimize douching, sprays, or powders in the genital area to prevent altering the pH and normal flora of this area.
- Teach females to wipe front to back to minimize contamination of the urethra with bacteria from the anus.

basics. https://www.cdc.gov/antibiotic-use/community/for-patients/common-illnesses/uti.html

16.4 Urinary Incontinence

OPEN RESOURCES FOR NURSING (OPEN RN)

Urinary incontinence is the involuntary loss of urine. Although abnormal, it is a common symptom that can seriously affect the physical, psychological, and social well-being of affected individuals of all ages. It has been estimated that 1 in 5 women develop urinary incontinence, but many are too embarrassed to discuss the condition with their health care providers. Some believe it's a normal part of aging that they have to live with. The result can be isolation and depression when they limit their activities and social interactions because of embarrassment due to incontinence. Nurses can greatly improve the quality of life for these clients by assessing for incontinence in a sensitive manner and then providing health teaching about methods to prevent and/or manage incontinence.

Types of Urinary Incontinence

Continence is achieved through an interplay of the physiology of the bladder, urethra, sphincter, pelvic floor, and the nervous system coordinating these

organs.[1] A disruption in any of these areas can cause several types of urinary incontinence[2,3]:

- **Stress urinary incontinence** is the involuntary loss of urine with intra-abdominal pressure (e.g., laughing and coughing) or physical exertion (e.g., jumping). It is caused by weak pelvic floor muscles that is often the result of pregnancy and vaginal delivery, menopause, and vaginal hysterectomy.
- **Urge urinary incontinence** (also referred to as "overactive bladder") is urine leakage caused by the sensation of a strong desire to void (urgency). It can be caused by increased sensitivity to stimulation by the detrusor muscle in the bladder or decreased inhibitory control of the central nervous system.
- **Mixed urinary incontinence** is a mix of urinary frequency, urgency, and stress incontinence.
- **Overflow incontinence** occurs when small amounts of urine leak from a bladder that is always full. This condition tends to occur in males with enlarged prostates that prevent the complete emptying of the bladder.
- **Functional incontinence** occurs in older adults who have normal bladder control but have a problem getting to the toilet because of arthritis or other disorders that make it hard to move quickly or manipulate zippers

1. McClurg, D., Pollock, A., Campbell, P., Hazelton, C., Elders, A., Hagen, S., & Hill, D. C. (2016). Conservative interventions for urinary incontinence in women: An overview of Cochrane systematic reviews. *The Cochrane Database of Systematic Reviews, 2016*(9). https://doi.org/10.1002/14651858.CD012337

2. Tso, C. (2018, January 10). Postmenopausal women and urinary incontinence. *American Nurse*. https://www.myamericannurse.com/postmenopausal-women-urinary-incontinence/

3. National Institute of Aging. (2022). *Urinary incontinence in older adults.* U.S. Department of Health & Human Services. https://www.nia.nih.gov/health/urinary-incontinence-older-adults

or buttons. Clients with dementia also have increased risk for functional incontinence.

It is important for nurses to understand the different types of incontinence so that appropriate interventions can be targeted to the cause.

Assessment of Incontinence

Assessment begins with screening questions during a health history, including questions such as, “Do you have any problems with the leakage or dribbling of urine? Do you ever have problems making it to the bathroom in time?” If a client responds “Yes” to either of these questions, it is helpful to encourage them to start a voiding diary to record their urination habits and activities. The voiding diary should include the following[4]:

- When and how much the client urinates
- Urinary leakage and what the client was doing when it happened (for example, running, biking, laughing)
- Sudden urges to urinate
- How often the client wakes at night to use the bathroom
- Type and volume of food and beverages and the time of intake
- Medication use, such as diuretics, and the timing of administration
- Any pain or problems experienced before, during, and after urinating (for example, sudden urges, difficulty urinating, dribbling urine, feeling as if the bladder is never empty, weak urine flow).

The provider will review information from the voiding diary, perform a physical assessment, and likely order diagnostic testing, such as a urine dip to check for a urinary tract infection, and urodynamic diagnostic testing that includes a variety of tests about bladder function, including filling, urine

4. Tso, C. (2018). Postmenopausal women and urinary incontinence. *American Nurse*. https://www.myamericannurse.com/postmenopausal-women-urinary-incontinence/

storage, and emptying.[5] Individualized treatment will be based on the assessment and tests to assess any structural abnormalities and bladder function.

Interventions

Nurses should use therapeutic communication with clients experiencing urinary incontinence to help them feel comfortable in expressing their fears, worries, and embarrassment about incontinence and work toward improving their quality of life. Let them know they're not alone and that urinary incontinence is not something they have to live with. Provide education about pelvic floor muscle training exercises, timed voiding, lifestyle modification, and incontinence products. Encourage them to learn more about their condition so they can optimally manage it and improve their quality of life.[6]

Nurses play an important role in educating clients about bladder control training to prevent incontinence. Bladder control training includes several these techniques[7]:

- Pelvic muscle exercises (also known as Kegel exercises) work the muscles used to stop urination, which can help prevent stress incontinence. Learn more about pelvic floor exercises in the box below.

5. Tso, C. (2018). Postmenopausal women and urinary incontinence. *American Nurse*. https://www.myamericannurse.com/postmenopausal-women-urinary-incontinence/

6. Tso, C. (2018). Postmenopausal women and urinary incontinence. *American Nurse*. https://www.myamericannurse.com/postmenopausal-women-urinary-incontinence/

7. National Institute of Aging. (2022). *Urinary incontinence in older adults*. U.S. Department of Health & Human Services. https://www.nia.nih.gov/health/urinary-incontinence-older-adults

- Timed voiding can be used to help a client regain control of the bladder. Timed voiding encourages the client to urinate on a set schedule, for example, every hour, whether they feel the urge to urinate or not. The time between bathroom trips is gradually extended with the general goal of achieving four hours between voiding. Timed voiding helps to control urge and overflow incontinence as the brain is trained to be less sensitive to the sensation of the bladder walls expanding as they fill.
- Lifestyle changes can help with incontinence. Losing weight, drinking less caffeine (found in coffee, tea, and many sodas), preventing constipation, and avoiding lifting heavy objects may help with incontinence. Limiting fluid intake before bedtime and scheduling prescribed diuretic medication in the morning or early afternoon are also helpful.
- Protective products may be needed to protect the skin from breakdown and prevent leakage onto clothing. Incontinence underwear has a waterproof liner and built-in cloth pad to absorb large amounts of urine to protect skin from moisture and control odor. It is available in daytime and nighttime styles (designed to hold more urine). A product resembling a tampon is another option for females. It is made of absorbent fibers that support the urethra and prevents accidental leaks but doesn't inhibit urination and won't move or fall out during bowel movements.

Teaching Pelvic Floor Exercises

Kegel exercises are designed to make your pelvic floor muscles stronger. Your pelvic floor muscles hold up your bladder and prevent it from leaking urine.

- **Start by finding the right muscles.** There are two easy ways to do this: stop the stream of urine as you are urinating or imagine that you are trying to stop the passage of gas. Squeeze the muscles you would use to do both. If you sense a "pulling" feeling, you are squeezing the

right muscles for pelvic exercises. Many people have trouble finding the right muscles. A doctor, nurse, or therapist can check to make sure you are doing the exercises correctly and targeting the correct muscles.

- **Find a quiet spot to practice so you can concentrate.** Lie on the floor. Pull in the pelvic muscles and hold for a count of 3. Then relax for a count of 3. Work up to 10 to 15 repeats each time you exercise.
- **Complete pelvic exercises at least three times a day.** Try to use three different positions while performing the exercises: lying down, sitting, and standing. For example, you can exercise while lying on the floor, sitting at a desk, or standing in the kitchen. Using all three positions while exercising makes these muscles their strongest.
- **Be patient.** Most people notice an improvement after a few weeks, but the maximum effect may take up to 3-6 weeks.

View a YouTube video about Kegel Exercises[8] from Michigan Medicine.

8. Michigan Medicine. (2016, September 14). *Better kegels: How to do kegel exercises, and why they work* [Video]. YouTube. All rights reserved. https://youtu.be/7C8uoq98x2A

Health teaching regarding other treatment options may be provided[9]:

- Biofeedback uses sensors to help a client become more aware of signals from the body to regain control over the muscles in their bladder and urethra.
- Mechanical devices, such as pessaries, support the urethra and can support vaginal prolapse to prevent or reduce urinary leakage. They come in various sizes and are professionally fitted by trained health care providers. They should be removed, cleaned, and reinserted regularly to prevent infection. Some of the devices, such as ring pessaries, can be removed and reinserted by the client. They are similar to a diaphragm and can be removed or left in place for sexual intercourse.
- Anticholinergic medications, such as oxybutynin, may be prescribed to treat urge urinary incontinence and mixed urinary incontinence. They block the action of acetylcholine and provide an antispasmodic effect on smooth muscle to relieve symptoms. However, side effects include dry mouth, constipation, dizziness, and drowsiness, which can increase fall risk in older adults.
- If bladder training and medications are not effective, surgery may be performed, such as a sling procedure or a bladder neck suspension.

9. National Institute of Aging. (2022). *Urinary incontinence in older adults*. U.S. Department of Health & Human Services. https://www.nia.nih.gov/health/urinary-incontinence-older-adults

16.5 Urinary Retention

OPEN RESOURCES FOR NURSING (OPEN RN)

Urinary retention is a condition when the client cannot empty all of the urine from their bladder. Urinary retention can be acute (i.e., the sudden inability to urinate after receiving anesthesia during surgery) or chronic (i.e., a gradual inability to completely empty the bladder due to enlargement of the prostate gland in males). Urinary retention is caused by a blockage that partially or fully prevents the flow of urine or the bladder not being able to create a strong enough force to expel all the urine. In addition to causing discomfort, urinary retention increases the client's risk for developing a urinary tract infection (UTI) because bacteria from the urethra can move up toward the bladder and multiply in retained urine. See Figure 16.5[1] for an image of an enlarged prostate gland blocking the flow of urine from the bladder into the urethra.

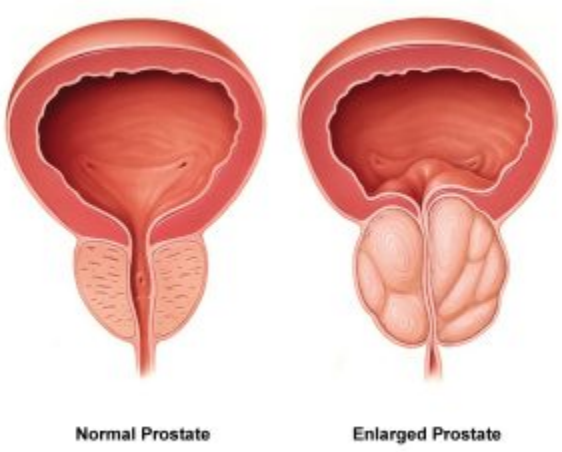

Figure 16.5 Enlarged Prostate Gland

1. "Normal-vs-enlarged-prostate.jpg" by Akcmdu9 is licensed under CC BY-SA 3.0

Symptoms of urinary retention can range from none to severe abdominal pain.[2] Health care providers use a client's medical history, physical exam finding, and diagnostic tests to find the cause of urinary retention. Nurses typically receive orders to measure post-void residual amounts when urinary retention is suspected. **Post-void residual** measurements are taken after a client has voided by using a bladder scanner or inserting a straight urinary catheter to determine how much urine is left in the bladder. See the following box regarding how to perform a bladder scan at the bedside. Read about other diagnostic tests related to urinary retention, such as urodynamic testing and cystoscopy, under the "Applying the Nursing Process" section of this chapter.[3]

Performing a Bladder Scan

A bladder scanner is a portable, noninvasive medical device that uses sound waves to calculate the amount of urine in a client's bladder. Nurses use bladder scanners at the bedside to determine post-void residual urine amounts in clients to avoid the need to perform an invasive urinary catheterization. Typically, the use of a bladder scan does not require a physician order but be sure to check agency policy.

2. National Institute of Diabetes and Digestive and Kidney Diseases. (2019). *Urinary retention*. U.S. Department of Health and Human Services. https://www.niddk.nih.gov/health-information/urologic-diseases/urinary-retention

3. National Institute of Diabetes and Digestive and Kidney Diseases. (2019). *Urinary retention*. U.S. Department of Health and Human Services. https://www.niddk.nih.gov/health-information/urologic-diseases/urinary-retention

After the client voids and is lying in a supine position, turn on the device and indicate if the client is male or female. (If the female has had a hysterectomy, then "male" is selected.) Apply warmed gel to the transducer head, and then place it approximately one inch above the symphysis pubis with the probe directed towards the bladder. Press the "scan" button, making sure to hold the scanner steady until you hear a beep. The bladder scanner will display the volume measured using a display with crosshairs. If the crosshairs are not centered on the urine displayed, adjust the probe and rescan until it is properly centered. If the post-void residual is greater than 300 mL, the provider should be notified and typically an order will be received for a straight urinary catheterization. Whenever possible, indwelling urinary catheterization is avoided to reduce the client's risk of developing a catheter-associated urinary tract infection (CAUTI).[4]

View this following YouTube video to see a bladder scanner in use[5]: How to Use BladderScan Prime Plus™ by Diane Newman

4. Agency for Healthcare Research and Quality. (2020). *Toolkit for reducing catheter-associated urinary tract infections in hospital units: Implementation guide – Appendix C. Sample bladder scan policy*. https://www.ahrq.gov/hai/cauti-tools/impl-guide/implementation-guide-appendix-c.html

5. BladderScanDevice. (2017, November 13). *How to use BladderScan Prime PlusTM by Diane Newman* [Video]. YouTube. All rights reserved. https://youtu.be/Q-sQu0T2oUY.

Interventions

Treatment for urinary retention depends on the cause. It may include urinary catheterization to drain the bladder, bladder training therapy, medications, or surgery.[6] Read more about bladder training therapy under the "Urinary Incontinence" section. Alpha blockers, such as tamsulosin (Flomax), are used to treat urinary retention caused by an enlarged prostate. A surgery called transurethral resection of the prostate (TURP) may be performed to treat urinary retention caused by an enlarged prostate that is not responsive to medication.

- Read more about urinary catheterization and preventing catheter-associated urinary tract infection (CAUTI) in "Facilitation of Elimination" in Open RN *Nursing Skills, 2e*.
- Read more about alpha-blocker medication (i.e., tamsulosin) in the "Autonomic Nervous System" chapter in Open RN *Nursing Pharmacology, 2e*.

6. National Institute of Diabetes and Digestive and Kidney Diseases. (2019). *Urinary retention*. U.S. Department of Health and Human Services. https://www.niddk.nih.gov/health-information/urologic-diseases/urinary-retention

16.6 Constipation

OPEN RESOURCES FOR NURSING (OPEN RN)

Constipation is defined by NANDA-I as, “Infrequent or difficult evacuation of feces.”[1] Typically a client is diagnosed with constipation if they have less than three bowel movements per week. Constipation can be caused by slowed peristalsis due to decreased activity, dehydration, lack of fiber, medications such as opioids, depression, or surgical procedures in the abdominal area. As the stool moves slowly through the large intestine, additional water is reabsorbed, resulting in the stool becoming hard, dry, and difficult to move through the lower intestines. See Figure 16.6[2] for the Bristol Stool Chart used to assess the characteristics of stools, ranging from constipation to diarrhea.

1. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

2. “Bristol_stool_chart.svg” by Cabot Health, Bristol Stool Chart is licensed under CC BY-SA 3.0

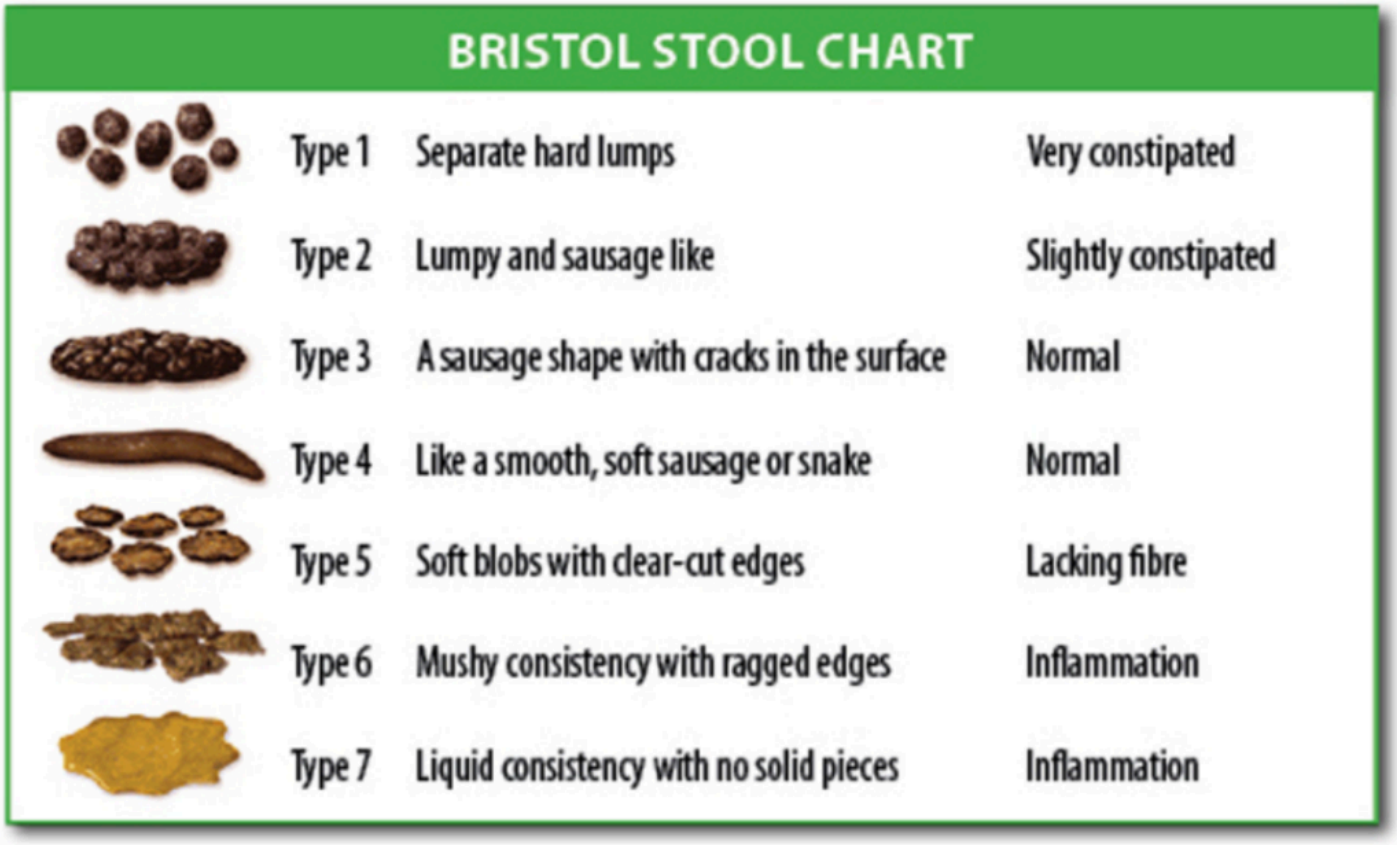

Figure 16.6 Bristol Stool Chart

The client may experience associated symptoms such as rectal pressure, abdominal cramps, bloating, distension, and straining. **Fecal impaction** can occur when stool accumulates in the rectum, usually due to the client not feeling the presence of stool or not using the toilet when the urge is felt. Fecal impact has hallmark signs of seepage of liquid stool from the anus. It is important to not confuse this seepage with diarrhea. Large balls of hard stool are treated with mineral oil enemas or digital removal (i.e., with a lubricated, gloved finger that can be painful for the client.)

Interventions

The goal of interventions implemented to treat constipation is to establish what is considered a normal bowel pattern for each client and to set an expected outcome of a bowel movement at least every 72 hours regardless of intake. Treatment typically includes a prescribed daily bowel regimen, such as

oral stool softeners (e.g., docusate) and a mild stimulant laxative (e.g., sennosides). Stronger laxatives (e.g., Milk of Magnesia or bisacodyl), rectal suppositories, or enemas are implemented when oral medications are not effective.

Clients should be educated about the importance of increased fluids, increased dietary fiber, and increased activity to prevent constipation. Some food sources, such as prune juice, prunes, and apricots, are helpful in preventing constipation. Over-the-counter medication, such as methylcellulose or psyllium, can be used to increase dietary fiber. When administering these medications, mix in a full eight-ounce glass of water to avoid the development of an intestinal obstruction.

> Read more about laxatives used to treat constipation in the "Gastrointestinal" chapter in Open RN *Nursing Pharmacology, 2e*.

Intestinal Obstruction or Paralytic Ileus

Intestinal obstruction is a partial or complete blockage of the intestines so that contents of the intestine cannot pass through it. It can be caused by **paralytic ileus**, a condition where peristalsis is not propelling the contents through the intestines, or by a mechanical cause, such as fecal impaction. Clients who have undergone abdominal surgery or received general anesthesia are at increased risk for paralytic ileus. Other risk factors include the chronic use of opioids, electrolyte imbalances, bacterial or viral infections of the intestines, decreased blood flow to the intestines, or kidney or liver disease. If an obstruction blocks the blood supply to the intestine, it can cause infection and tissue death (gangrene).[3]

3. U.S. National Library of Medicine. (2024). *Intestinal obstruction and ileus*. MedlinePlus. https://medlineplus.gov/ency/article/000260.htm

Symptoms of an intestinal obstruction or paralytic ileus include abdominal distention or a feeling of fullness, abdominal pain or cramping, inability to pass gas, vomiting, constipation, or diarrhea. Bowel sounds must be assessed for abnormal findings. It can be difficult to accurately interpret changes in bowel sounds, so any change in bowel sounds accompanied with other symptoms should be reported to the health care provider. Early intestinal obstruction can present with high-pitched "tinkling" sounds. Hypoactive bowel sounds can indicate constipation and may occur after abdominal surgery, anesthesia, or with use of opioid medications. Absent bowel sounds can indicate an ileus or mechanical bowel obstruction.[4] Because of the common occurrence of paralytic ileus in postoperative clients, nurses routinely monitor for these symptoms, and diet orders are not upgraded until the client is able to pass gas.

Treatment includes maintaining strict NPO status and typically includes insertion of an NG tube attached to suction to help relieve abdominal distention and vomiting until peristalsis returns. Obstructions may require surgery if the tube does not relieve the symptoms or if there are signs of tissue death.[5]

> Read more about NG tubes in "Enteral Tube Management" in Open RN *Nursing Skills, 2e*.

4. U.S. Nation Library of Medicine. (2022). *Abdominal sounds.* Medline Plus. https://medlineplus.gov/ency/article/003137.htm
5. U.S. National Library of Medicine. (2024). *Intestinal obstruction and ileus.* MedlinePlus. https://medlineplus.gov/ency/article/000260.htm

16.7 Diarrhea

OPEN RESOURCES FOR NURSING (OPEN RN)

Diarrhea is defined as having more than three unformed stools in 24 hours. It can cause dehydration, skin breakdown, and electrolyte imbalances. Diarrhea is caused by increased peristalsis, causing the stool to move too quickly through the large intestines so that water is not effectively reabsorbed, resulting in loose, watery stools.

Many conditions can cause diarrhea, such as infectious processes (bacteria, viruses, and protozoa), food poisoning, medications (such as antibiotics and laxatives), food intolerances, allergies, anxiety, and medical conditions like irritable bowel disease and Crohn's disease or dumping syndrome for clients receiving tube feeding or those who underwent gastric bypass. Antibiotic therapy also places clients at risk of developing *Clostridium difficile* (C-diff) infection due to the elimination of normal flora in the gastrointestinal tract. Clients with C-diff have very watery, foul-smelling stools, and transmission-based precautions are implemented to prevent the spread of infection.

> Read more about C-diff and transmission-based precautions in the "Infection" chapter in this text.

Interventions

Treatment of diarrhea includes promoting hydration with water or other fluids (e.g., sports drinks) that improve electrolyte status. Intravenous fluids may be required if the client becomes dehydrated. Medications such as loperamide, psyllium, and anticholinergic agents may be prescribed to treat diarrhea causing dehydration. In some cases, rectal tubes may be prescribed to collect watery stool when skin breakdown or wound contamination is a

concern, or if rectal antibiotics are prescribed with a dwelling time. However, strict monitoring is required due to possible damage to the rectal mucosa.

> Read about medications used to treat diarrhea in the "Gastrointestinal" chapter in Open RN *Nursing Pharmacology, 2e*.

16.8 Bowel Incontinence

OPEN RESOURCES FOR NURSING (OPEN RN)

Bowel incontinence is the accidental loss of bowel control causing the unexpected passage of stool. Incontinence can range from leaking a small amount of stool or gas to not being able to control bowel movements. The rectum, anus, pelvic muscles, and nervous system must work together to control bowel movements. A client must also be able to recognize and respond to the urge to have a bowel movement. If there is a problem with any of these factors, bowel incontinence can occur.[1]

Causes of bowel incontinence include the following[2]:

- Ongoing (chronic) constipation, causing the anus muscles and intestines to stretch and weaken, leading to diarrhea and stool leakage
- Fecal impaction with a lump of hard stool that partly blocks the large intestine
- Long-term laxative use
- Colectomy or bowel surgery
- Lack of sensation of the need to have a bowel movement
- Gynecological, prostate, or rectal surgery
- Injury to the anal muscles in women due to childbirth

1. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share
2. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share

- Nerve or muscle damage from injury, a tumor, or radiation
- Severe diarrhea that causes leakage
- Severe hemorrhoids or rectal prolapse
- Stress of being in an unfamiliar environment
- Emotional or mental health issues

Interventions

Many people feel embarrassed about bowel incontinence and do not share this information with their health care provider. It is essential for nurses to communicate therapeutically with clients experiencing bowel incontinence and let them know it can often be treated with simple changes such as diet changes, bowel retraining, pelvic floor exercises, or surgery.[3]

Ask the client to track the foods eaten to determine if certain types of foods cause problems. Foods that may lead to incontinence in some people include the following[4]:

- Alcohol
- Caffeine
- Dairy products (due to lactose intolerance)
- Fatty, fried, or greasy foods
- Spicy foods
- Cured or smoked meats
- Sweeteners such as fructose, mannitol, sorbitol, and xylitol

3. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share

4. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share

It is often helpful to add fiber to the diet to add bulk and thicken loose stool. To increase fiber, encourage the client to eat whole grains with a goal of 30 grams of fiber a day. Other products, such as psyllium, can be used to add bulk to stools.[5]

Bowel retraining involves teaching the body to have a bowel movement at a certain time of the day. This also includes encouraging the client to go to the bathroom when feeling the urge to do so and not ignoring it. For some people, it is helpful to schedule this consistent time in the morning when the natural urge occurs after drinking warm fluids or eating breakfast. For other people, especially those with a neurological cause, a laxative may be scheduled every three days to stimulate the urge to have a bowel movement.[6]

Clients can be educated about pelvic floor exercises to regain control of their anal sphincter muscle.[7] Read more about pelvic floor exercises under the "Urinary Incontinence" section.

Some clients can't tell when it's time to have a bowel movement or they can't move well enough to get to the bathroom safely on their own. These clients require special care in long-term care settings. To promote effective

5. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share

6. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share

7. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share

bowel movements, assist them to the toilet after meals and when they feel the urge. Also, make sure the bathroom is comfortable and private.[8]

If these simple treatments do not work, surgery may be needed to correct the problem. There are several types of procedures that a surgeon selects based on the cause of the bowel incontinence and the person's general health.[9]

Encourage clients with bowel incontinence to use special pads or undergarments to help them feel protected from accidents when they leave home. These products are available in pharmacies and in many other stores.

8. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share

9. U.S. National Library of Medicine. (2022). *Bowel incontinence*. MedlinePlus. https://medlineplus.gov/ency/article/003135.htm?utm_source=email&utm_medium=share&utm_campaign=mplus_share

16.9 Applying the Nursing Process

OPEN RESOURCES FOR NURSING (OPEN RN)

Now that we have discussed several alterations in elimination, let's apply the nursing process to clients experiencing these conditions.

Assessment

Urinary Elimination Assessment

Assessment of the urinary system includes asking questions about voiding habits, frequency, and if there is difficult or painful urination. The bladder may be palpated above the symphysis pubis for distention. If the client has incontinence, the perineal area should be inspected for skin breakdown. If urinary retention is suspected, a post-void residual amount may be measured by using a bladder scanner or by straight urinary catheterization. For a summary of common signs and symptoms associated with alterations in urinary elimination, see the "Selected Defining Characteristics" listed in Table 16.9a under the "Diagnosis" subsection.

If a client has had an indwelling urinary catheter removed recently, specific assessments should be performed to monitor for urinary tract infection and other complications.

Read more about caring for clients with urinary

- catheters in the "Facilitation of Elimination" chapter in Open RN *Nursing Skills, 2e*.

Bowel Elimination Assessment

Subjective assessment of the bowel system includes asking about the client's normal bowel pattern, the date of the last bowel movement, characteristics of the stool, and if any changes have occurred recently in stool characteristics or pattern. A normal pattern is typically one bowel movement every one to three days with stools having a soft or formed consistency. Refer to Figure 16.6[1] under the "Constipation" section regarding using the Bristol Stool Chart to evaluate stool consistency.

Based on the client's answers, additional questions can be included, such as bowel routines/toileting, the amount of fiber and fluid in the daily diet, daily activity, and the use of opioid medications. Keep in mind that clients who have recently undergone diagnostic procedures that include barium contrast can have significant hardening of the stool if the barium is not expelled within a day or two of the procedure. Clients are typically prescribed a stimulant laxative (such as Milk of Magnesia) to promote barium expulsion after these types of procedures. Additionally, clients who have recently had abdominal surgical procedures under general anesthesia are at increased risk of paralytic ileus.

For a summary of common symptoms associated with alterations in urinary elimination, see the "Selected Defining Characteristics" listed in Table 16.9a under the "Diagnosis" subsection.

The abdomen should be inspected for distension, bulging, bruising, or pulsatile masses and then auscultated for bowel sounds, noting if they are

1. "Bristol_stool_chart.svg" by Cabot Health, Bristol Stool Chart is licensed under CC BY-SA 3.0

present, hyperactive, or hypoactive in all four quadrants. If bowel sounds are absent or there are other signs of possible obstruction or paralytic ileus, the provider should be notified immediately. A light palpation of the abdomen is performed to determine if there are tender areas, abnormal masses, or a firmness in the left lower quadrant, indicating the presence of stool. If pulsatile masses, distension, rigidity, or other indication of suspected abdominal problems is noted on inspection, the abdomen should not be deeply palpated due to the risk of injury or complications with palpation.[2]

During inpatient care, the client is often requested to call the nurse when a bowel movement has occurred so the stool characteristics can be assessed. Document the amount (small, medium, or large), consistency (soft, formed, or hard) and color (brown or other color). Alterations in these characteristics can be caused by several conditions, such as infection, parasites, inflammatory conditions of the intestines or gallbladder, or liver conditions.

Some clients have surgical diversions for diseases such as diverticulitis or cancer. Ostomies are surgical openings in the abdomen for the expulsion of stool into a bag-like appliance. An ileostomy is an opening created at the juncture of the small and large intestines, so the stool has a liquid consistency. A colostomy is placed farther along the large intestines, where more water has been absorbed, so the stool is more formed.

- Read about expected and unexpected findings during an abdominal assessment in the "Abdominal Assessment" chapter in Open RN *Nursing Skills, 2e*.
- Read about caring for clients with ostomies in the "Facilitation of Elimination" chapter in Open RN *Nursing Skills, 2e*.

2. Mehta, M. (2010). Assessing the abdomen. *Nursing Critical Care, 5*(1), 47-48. https://doig.org/10.1097/01.CCN.0000365703.35731.b7

Urinary Diagnostic Tests

There are several commonly ordered diagnostic tests for urinary conditions, such as a urine dip, urinalysis, urine culture, cystoscopy, and urodynamic flow studies.

URINE DIP

A urine dip test refers to a treated chemical strip (dipstick) being placed in a urine sample. Patches on the dipstick will change color to indicate the presence of substances such as white blood cells, protein, or glucose. See Figure 16.7[3] for an image of a urine dipstick test. Urine is collected for a urine dip test in a clean container. Using the "clean catch" technique, the skin surrounding the urethra should be cleaned with a special towelette before the urine is collected. Catching the urine "midstream" is the goal, so request the client to start urinating, stop, and then urinate into the container.

3. "Chemstrip2.jpg" by J3D3 is licensed under CC BY-SA 3.0

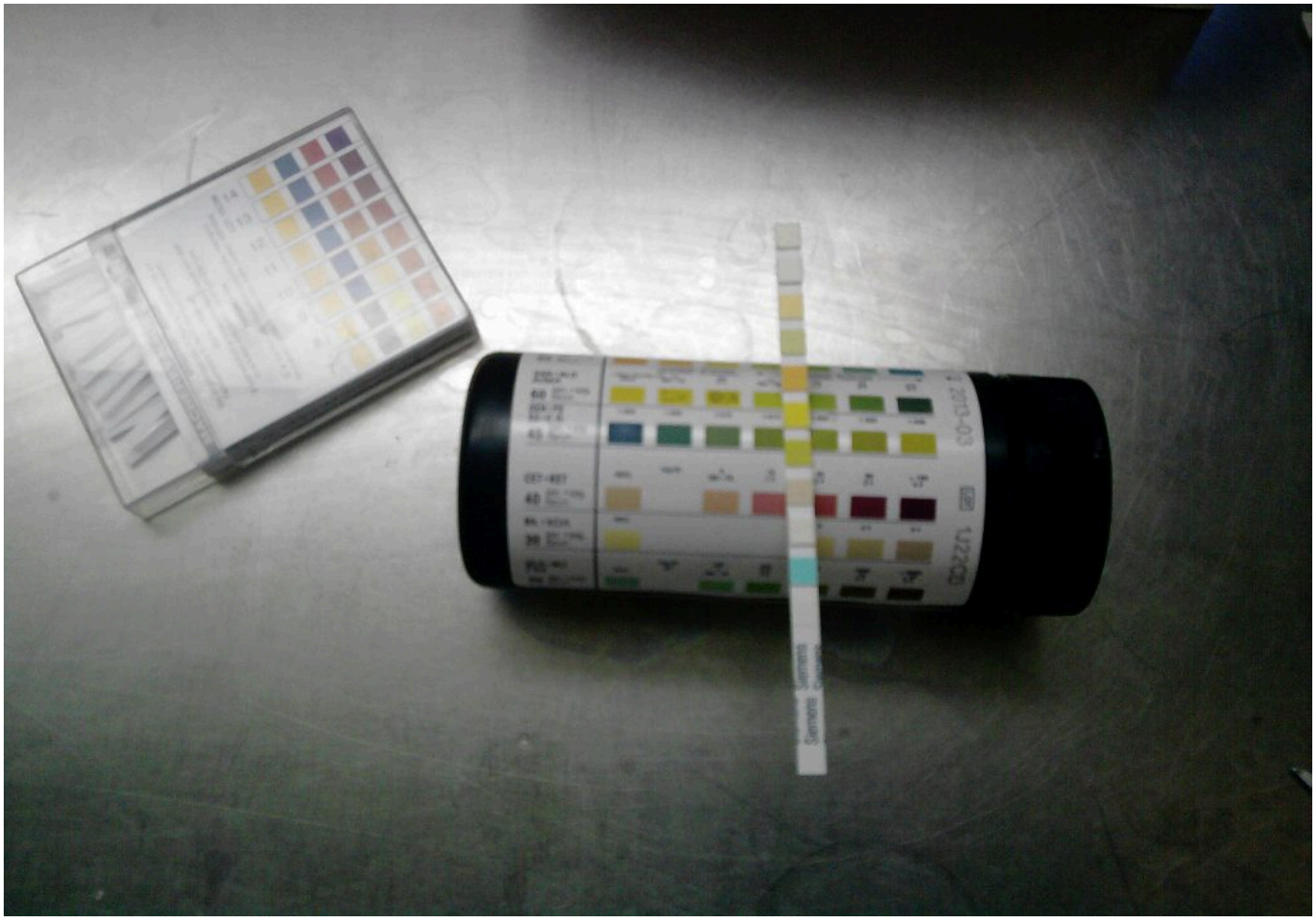

Figure 16.7 Urine Dipstick Test

URINALYSIS

A urinalysis includes a physical, chemical, and microscopic examination of urine by a lab technician. It requires collection of a "clean catch" urine sample in a sterile container that is analyzed by a lab technician under a microscope.[4] See Table 16.9a for a selected urinalysis findings and their clinical significance.

4. U.S. National Library of Medicine. (2024). *Urinalysis*. MedlinePlus. https://medlineplus.gov/urinalysis.html

Table 16.9a Selected Urinalysis Findings and Their Clinical Significance[5]

5. Queremel, M. & Jialal, I. (2023) *Urinalysis*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK557685/

Component	Normal Findings	Abnormal Findings & Their Clinical Significance
Color	Yellow (light/pale to dark)	Amber: Bile pigments Tea-colored: Bile pigments, medication side effects Dark yellow: Concentrated urine Green/blue: Side effects of medication Orange: Bile pigments or side effects of medications or food Pink/Red: Blood in urine, menstrual contamination, uric acid crystals, side effects of medication or food
Appearance	Clear, translucent	Cloudy:Bacteria, precipitation of cells, pus, or contamination
Odor	None or typical urine odor	Fruity/sweet: Diabetic ketoacidosis Fecal smell: Gastrointestinal/bladder fistula or fecal contamination Pungent: Urinary tract infection
Urine pH		>8: Old specimens, vegetarian diet, vomiting <4.5: Cranberry juice, dehydration, diabetes mellitus, diabetic ketoacidosis, diarrhea, emphysema, high protein diet, medication side effects
Red Blood Cells (RBCs)	0-5 RBCs per mL	Greater than 5 RBCs/ml (hematuria): Renal stones, pyelonephritis, tumors, trauma, contamination with menstrual blood, contamination post masturbation
White Blood Cells (WBCs)		Greater than 5 WBCs/ml: Urinary tract infection, inflammation
Nitrites	Negative	Positive: Urinary tract infection (*However, false-positive and false-negative results can occur.)

Leukocyte esterase	Negative	Positive: Inflammation of urinary tract, tuberculosis, bladder tumors, kidney stones, or fever (*However, false-positive and false-negative results can occur.)
Protein	<150 mg/day or <10 mg/dL	>150 mg/day or > 10mg/dL: Early renal disease, pyelonephritis, congestive heart failure, physiological conditions such as strenuous exercise, fever, dehydration; false positive/negative results based on urine pH and concentration
Glucose	Negative	Positive: Diabetes, Cushing syndrome, pregnancy; false-positive with ketone presence
Ketones	Negative	Positive: Diabetic ketoacidosis, pregnancy, keto diet, starvation, fever
Bilirubin	Negative	Positive: Liver dysfunction, bile duct obstruction, hepatitis, cirrhosis

See Figure 16.8[6] for an image of white blood cells, referred to as pyuria, as seen on a urinalysis under a microscope. A urinalysis looks for evidence of infection, including elevated numbers of bacteria and white blood cells. A positive leukocyte esterase test or the presence of nitrite also supports the diagnosis of a UTI.[7]

6. "Pyuria2.JPG" by Bobjgalindo is licensed under CC BY-SA 4.0

7. Testing.com (2020). *Urinary tract infection.* Testing.com. https://www.testing.com/uti-testing/

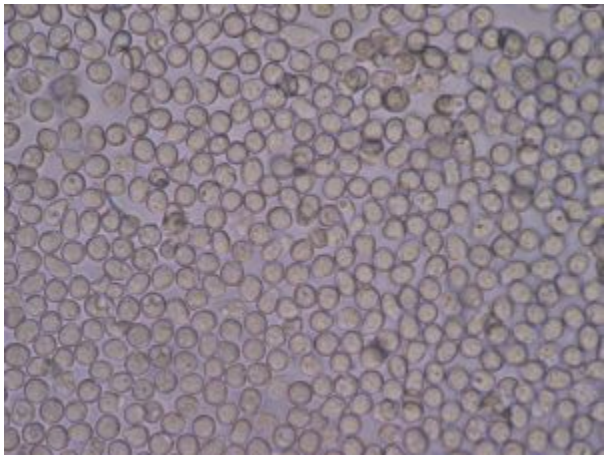

Figure 16.8 Urinalysis Demonstrating White Blood Cells

URINE CULTURE

A urine culture identifies the specific microbe causing a urinary tract infection. If this is the client's first, uncomplicated UTI of the lower urinary tract, the provider often assumes it is caused by the most common microbe, E. coli, and treats it with antibiotics without performing a culture. However, cultures are typically performed for clients with recurring UTIs or hospitalized clients at risk for hospital-associated infections.[8]

When interpreting urine culture results, the presence of a single type of bacteria growing at high colony counts is typically considered a positive urine culture. For clean catch samples that have been properly collected, cultures with greater than 100,000 colony forming units (CFU)/milliliter of one type of bacteria usually indicate infection.[9]

If a culture is positive, susceptibility testing is performed to guide treatment. Although a variety of bacteria can cause UTIs, most are due to

8. Testing.com. (2022). *Urine Culture Test*. Testing.com. https://www.testing.com/tests/urine-culture/

9. Testing.com. (2022). *Urine Culture Test*. Testing.com. https://www.testing.com/tests/urine-culture/

Escherichia coli (E. coli) bacteria that are common in the digestive tract and routinely found in stool. Other bacteria that commonly cause UTIs include *Proteus, Klebsiella, Enterobacter, Staphylococcus*, and *Acinetobacter*. Susceptibility testing determines which antibiotics will inhibit the growth of the specific bacteria causing the infection. It is important for nurses to review culture results to verify the antibiotic therapy being administered has been found to be effective against the type of bacteria discovered in the culture. If there is any concern about the susceptibility results and current antibiotic therapy, the health care provider should be notified.

A culture that is reported as "no growth in 24 or 48 hours" usually indicates that there is no infection. If a culture shows growth of several different types of bacteria, then it is likely due to contamination of the urine sample during collection. This is especially true in voided urine samples if the organisms present include *Lactobacillus* and/or other common nonpathogenic vaginal bacteria in women. The provider may request a repeat culture on a sample that is more carefully collected.[10]

CYSTOSCOPY

A cystoscopy is a procedure completed by a health care provider with a cystoscope, a small, thin tube with a camera on the end that is inserted into the urethra and into the bladder. See Figure 16.9[11] for an illustration of cystoscopy. Fluid is inserted to expand the bladder so the bladder walls can be visualized. Biopsy samples can be taken from abnormal tissue through the tube and then sent to a medical lab for analysis. The client will feel the need to urinate when the bladder is full, but the bladder must stay full until the procedure is completed. A slight pinch may be felt if a biopsy sample is obtained. After the procedure, the client should be encouraged to drink four

10. Testing.com. (2022). *Urine Culture Test*. Testing.com. https://www.testing.com/tests/urine-culture/

11. "Diagram_showing_a_cystoscopy_for_a_man_and_a_woman_CRUK_064.svg" by Cancer Research UK is licensed under CC BY-SA 4.0

to six glasses of water per day, as appropriate for their medical status. A small amount of blood may be present in the urine after the procedure, but if the bleeding continues after urinating three times, or if other signs of infection are present, the provider should be notified.[12]

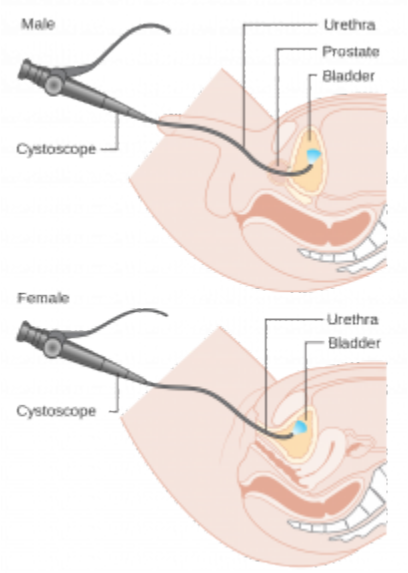

Figure 16.9 Cystoscopy

URODYNAMIC FLOW TEST

Urodynamic testing is any procedure that looks at how well the bladder, sphincters, and urethra are storing and releasing urine. Most urodynamic tests focus on the bladder's ability to hold urine and empty steadily and completely. Urodynamic tests can also show whether the bladder is having involuntary contractions that cause urine leakage.[13]

12. U.S. National Library of Medicine. (2024). *Cystoscopy*. MedlinePlus. https://medlineplus.gov/ency/article/003903.htm

13. National Institute of Diabetes and Digestive and Kidney Diseases. (2021). *Urodynamic testing*. U.S. Department of Health and Human Services. https://www.niddk.nih.gov/health-information/diagnostic-tests/urodynamic-testing

Bowel Diagnostic Tests

There are several common diagnostic tests related to bowel elimination, including stool-based tests, a colonoscopy, a barium enema, and an abdominal CT scan.

STOOL-BASED TESTS

Stool samples can be tested for bacteria, viruses, parasites, cancer, or for **occult blood** (i.e., hidden blood). Follow specific instructions from the lab for collecting the sample.

The Guaiac-Based Fecal Occult Blood Test finds hidden blood in the stool. As a screening test for colon cancer, it is performed annually. Before the test, the client should avoid many foods, such as red meat, melons, beets, and grapefruit for three days. They should not take aspirin or NSAIDs for seven days prior to the test. Stool samples from three separate bowel movements are smeared onto small paper cards and then returned to the medical lab for testing. If the test is positive (i.e., hidden blood is found), a follow-up colonoscopy is scheduled.[14] See Figure 16.10[15] for an image of a typical card used to collect the stool smear for the test after a special solution has been applied. The blue color indicates a positive result for occult blood.

14. American Cancer Society. (2020). *Colorectal cancer screening tests*. https://www.cancer.org/content/cancer/en/cancer/colon-rectal-cancer/detection-diagnosis-staging/screening-tests-used.html

15. "Guaiac_test.jpg" by unknown author is in the Public Domain

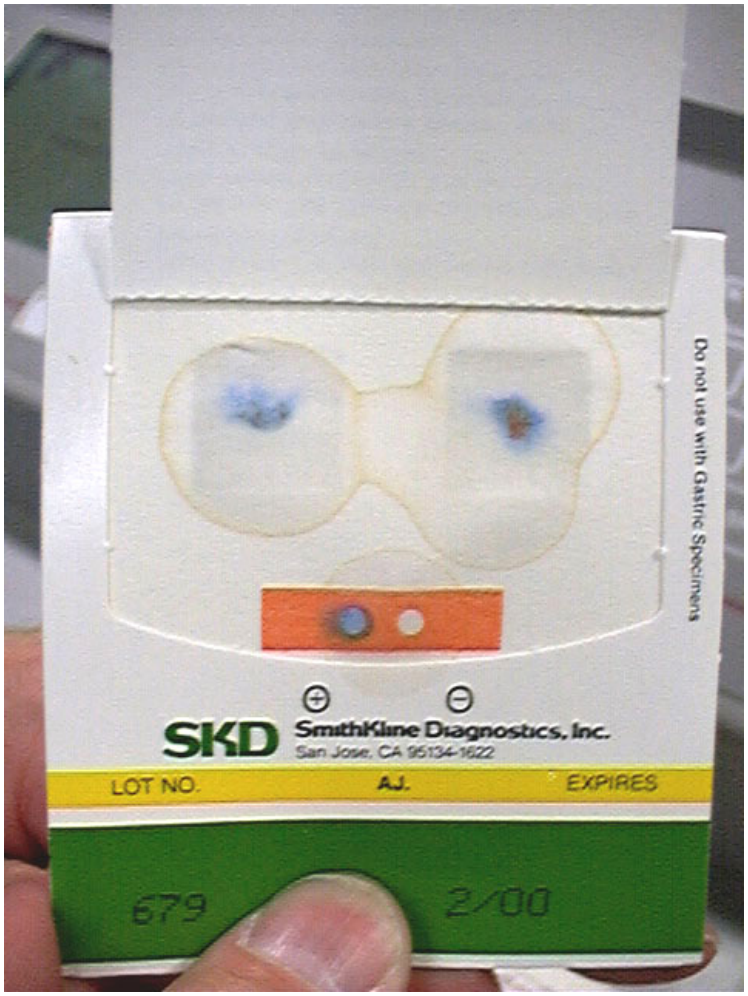

Figure 16.10 Guaiac Test

The Stool DNA Test (also called Cologuard) looks for certain abnormal sections of DNA from cancer or polyp cells and also checks for occult blood. Specific collection kits, including a sample container, liquid preservative, and specific instructions are provided.[16]

16. American Cancer Society. (2020). *Colorectal cancer screening tests*. https://www.cancer.org/content/cancer/en/cancer/colon-rectal-cancer/detection-diagnosis-staging/screening-tests-used.html

COLONOSCOPY

During a colonoscopy, an instrument called a colonoscope is used. The colonoscope has a tiny camera attached to a long, thin tube that is inserted into the anus to check the entire colon and rectum. See Figure 16.11[17] for an illustration of a colonoscopy. This procedure is used to screen clients for colon cancer. Screening is recommended to start at age 50 (or 45 for high-risk populations, including African Americans), and thereafter once every ten years or as prescribed by the provider. It is also used to evaluate the colon for inflamed tissue and abnormal growths or lesions. Before the procedure, the client must complete a bowel prep that typically consists of a clear liquid diet and laxatives the day before the procedure to clean out the intestine so that everything can be seen clearly. Each provider typically has their own specific set of bowel prep instructions. Medications such as aspirin or anticoagulants may be ordered to be withheld for several days before the test. Clients are generally NPO after a specific time the night before the test. During the procedure, the client receives sedative medication to stay relaxed. If a polyp is found, it can be removed during the procedure and sent for biopsy. Because air is inserted into the colon during procedure, the client may feel bloated or have abdominal cramps and should be encouraged to freely pass the gas. Because this is typically an outpatient procedure, the client is unable to drive after the test and requires transportation. Potential complications of the procedure are rare but include bleeding and perforation of the colon. The client should receive written instructions for when to contact the health care provider or emergency services if complications occur.[18,19]

17. "Diagram_showing_a_colonoscopy_CRUK_060.svg" by Cancer Research UK is licensed under CC BY-SA 4.0

18. U.S. National Library of Medicine. (2024). *Colonoscopy*. MedlinePlus. https://medlineplus.gov/colonoscopy.html

19. American Cancer Society. (2019). *Colonoscopy*. https://www.cancer.org/treatment/understanding-your-diagnosis/tests/endoscopy/colonoscopy.html

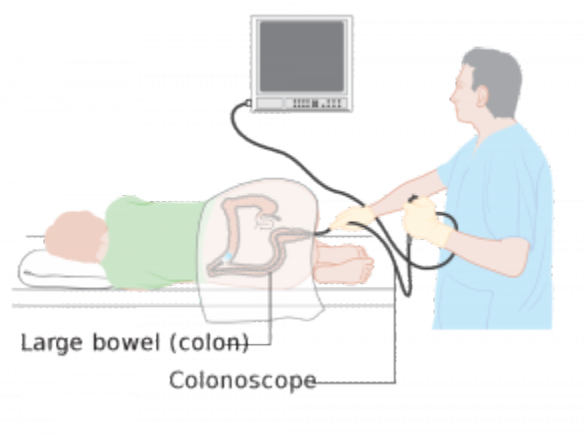

Figure 16.11 Colonoscopy

BARIUM ENEMA

A barium enema is a special X-ray of the large intestine, including the colon and rectum, that is performed before and after instillation of barium via an enema. This test may also be referred to as a "lower GI series." It is an older diagnostic test that has been mostly replaced by the colonoscopy test. Prior to the procedure, the client completes a bowel preparation regimen to cleanse the colon, which typically includes a clear liquid diet for one to three days, followed by the administration of laxative medication and/or an enema. During the procedure, an X-ray is taken, and then an enema containing barium is administered. Additional X-rays are taken as the client changes position to get different views of the colon. See Figure 16.12[20] for an image of barium enema results. After the procedure, it is normal for the client to have white stools for a few days. The client should be encouraged to drink extra

20. "Human_intestinal_tract,_as_imaged_via_double-contrast_barium_enema.jpg" by Glitzy queen00 at English Wikipedia is in the Public Domain

fluids, as appropriate, and a laxative may be prescribed to prevent hard stools that can cause constipation.[21]

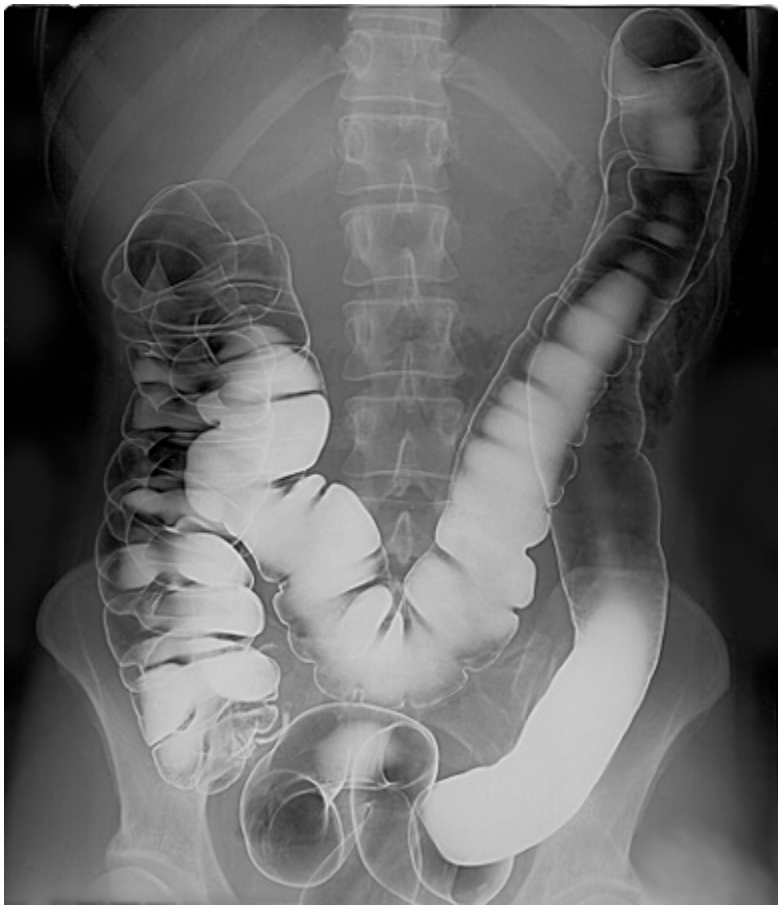

Figure 16.12 Barium Enema

ABDOMINAL CT SCAN

An abdominal CT scan is an imaging method that uses a series of X-rays to create cross-sectional pictures of the abdomen. Because of the series of X-rays, clients are exposed to more radiation than when receiving a traditional X-ray. They will lie on a narrow table that slides into the CT scanner where the machine's X-ray beam rotates around them. A computer creates separate images, called slices, that can be viewed on a monitor or printed on film.

21. U.S. National Library of Medicine. (2023). *Barium enema*. MedlinePlus. https://medlineplus.gov/ency/article/003817.htm

Three-dimensional models of the area can be made by stacking the slices together.[22] See Figure 16.13[23] for an image of a CT scan.

Figure 16.13 CT Scan

A special dye, called **contrast**, is administered to clients before some tests so that certain areas show up better on the X-rays. If contrast is used, the client may be required to be NPO for four to six hours before the test. Contrast can be administered orally, rectally, or intravenously.

Oral contrast has a chalky taste and will pass out of your body through the stools. Clients receiving IV contrast may feel a slight burning sensation, metallic taste in the mouth, or warm flushing of the body that resolves in a few seconds.

Before sending the client for a procedure using contrast, check for previous allergies to iodine or other contrast dyes. Some clients may be prescribed diphenhydramine or corticosteroids before receiving the contrast if they have had a previous allergic reaction. Verify their kidney functioning status by checking BUN, creatinine, and EGFR values because IV contrast can worsen

22. U.S. National Library of Medicine. (2022). *Abdominal CT scan*. MedlinePlus. https://medlineplus.gov/ency/article/003789.htm

23. "UW_Medical_Center_PET-CT-Scan.jpg" by Clare McLean for UW Medicine is licensed under CC BY 3.0

kidney function. If kidney function labs are abnormal, the nurse should notify the provider prior to the administration of IV contrast. If the client is currently taking the antidiabetic medication metformin, there may be restrictions placed on the administration of metformin before or after the procedure. Jewelry should be removed before the procedure.[24]

After the procedure, encourage clients who have received contrast to increase their fluid intake to help eliminate it from their body, as appropriate. If they received barium, their stools will be light in color, and post-procedural laxatives are typically prescribed to prevent the stool from hardening, which can cause an impaction or obstruction.

Diagnosis

There are several nursing diagnoses related to alterations in elimination. Refer to a nursing care planning resource for current NANDA-I nursing diagnoses and evidence-based interventions. See Table 16.9b for common NANDA-I diagnoses related to elimination.

Table 16.9b Common NANDA-I Nursing Diagnoses Related to Alterations in Elimination

24. U.S. National Library of Medicine. (2022). *Abdominal CT scan*. MedlinePlus. https://medlineplus.gov/ency/article/003789.htm

NANDA-I Diagnosis	Definition	Selected Defining Characteristics
Constipation	Decrease in normal frequency of defecation accompanied by difficult or incomplete passage of stool and/or passage of excessively hard, dry stool	• Abdominal pain • Change in bowel pattern • Hard, formed stool • Hypoactive bowel sounds • Liquid stool (with fecal impaction) • Palpable abdominal mass • Rectal pressure • Straining with defecation • Vomiting
Diarrhea	Passage of loose, unformed stools	• Abdominal pain • Bowel urgency • Cramping • Hyperactive bowel sounds • Loose liquid stools • Greater than three stools in 24 hours

Bowel Incontinence	Involuntary passage of stool	• Bowel urgency • Lack of recognition and of urge to defecate • Fecal staining • Inability to delay defecation
Stress Urinary Incontinence	Sudden leakage of urine with activities that increase intraabdominal pressure	• Involuntary leakage of small volume of urine
Urge Urinary Incontinence	Involuntary passage of urine occurring soon after a strong sensation or urgency to void	• Inability to reach toilet in time to avoid urine loss • Urinary urgency • Involuntary loss of urine with bladder contractions
Urinary Retention	Inability to empty bladder completely	• Bladder distension • Dribbling of urine • Frequent voiding • Sensation of bladder fullness • Small voids • Residual urine

Sample PES Statements

Sample PES statements for the nursing diagnoses are as follows:

- *Constipation related to insufficient fluid and fiber intake as evidenced by decreased stool frequency, hypoactive bowel sounds, and straining with defecation.*
- *Diarrhea related to gastrointestinal irritation as evidenced by cramping, hyperactive bowel sounds, and greater than three liquid stools in 24 hours.*
- *Bowel Incontinence related to generalized decline in muscle tone as evidenced by an involuntary passage of stool.*
- *Stress Incontinence related to weak pelvic floor muscles as evidenced by leakage of a small amount of urine when laughing and jumping.*
- *Urinary Urge Incontinence related to ineffective toileting habits as evidenced by the inability to reach the toilet in time to avoid urine loss and frequently wet underclothes.*
- *Urinary Retention related to blockage in the urinary tract as evidenced by dribbling of urine in small amounts with frequent voiding and a reported sensation of bladder fullness.*

Outcome Identification

See Table 16.9c for sample goals and outcome criteria associated with nursing diagnoses related to elimination alterations.

Table 16.9c Sample Goals and Outcome Criteria for Alterations in Elimination

Nursing Diagnosis	Overall Goal	SMART Outcomes
Constipation	The client will have a bowel movement every 1-3 days with soft, formed stool and ease of stool passage.	The client will have a bowel movement with soft, formed stool in the next 24 hours.
Diarrhea	The client will have a regular bowel elimination pattern with soft, formed stool.	The client will report relief from cramping and fewer episodes of diarrhea in the next eight hours.
Stress Incontinence	The client will have urinary continence as evidenced by no urine leakage with intra-abdominal pressure and dry underclothes and bedding.	The client will report fewer episodes of stress incontinence in their bladder log over the next month.
Urge Incontinence	The client will have urinary continence as evidenced by adequate time to reach the toilet and dry underclothes and bedding.	The client will report fewer incontinence episodes over the next month.
Urinary Retention	The client will experience improved urinary elimination as evidenced by complete emptying of the bladder and absence of urinary leakage.	The client will report a feeling of complete emptying of the bladder by next week.

Planning Interventions

Plan interventions customized to each client's alteration, cause of the condition, and related SMART outcomes. See Table 16.9d for a summary of interventions for selected bladder and bowel alterations discussed in this chapter.

16.9d Summary of Interventions For Selected Bladder and Bowel Alterations

Alteration	Interventions
Urinary Tract Infection	Administer antibiotics as prescribed Encourage increased fluid intake Provide client education regarding UTI prevention, including: • Urinate after sexual activity to flush bacteria away from the urethra. • Stay well-hydrated and urinate regularly. • Take showers instead of baths to minimize irritation and bacterial contamination of the urethra. • Minimize douching, sprays, or powders in the genital area to prevent altering the pH and normal flora of this area. • Teach females to wipe front to back to minimize contamination of the urethra with bacteria from the anus.
Urinary Incontinence	Engage with client using therapeutic communication Provide client education regarding bladder control training, including: • Pelvic floor (Kegel) exercises to help prevent stress incontinence • Timed voiding with gradual extension of time between voiding to help control urge and overflow incontinence • Lifestyle changes such as weight loss, decreased caffeine intake, preventing constipation, avoiding heavy lifting, limiting fluid intake or diuretic use before bedtime • Protective products such as incontinence pads or skin protectants to manage incontinence and possible associated skin breakdown

Urinary Retention	Monitor post-void residual Perform bladder scanning to determine presence of urine in bladder Perform urinary catheterization to empty bladder Administer medications as prescribed to relax prostate Monitor for signs of UTI due to retained urine Provide client education regarding bladder control training as appropriate
Constipation	Implement bowel regimen as ordered, such as oral stool softeners, mild stimulant laxatives, progressing to stronger laxatives, rectal suppositories, or enemas Provide client education and encouragement regarding the importance of: • Increased oral fluids to help soften stool • Increased dietary fiber to bulk up stool • Increased activity to promote peristalsis
Fecal Impaction	Administer mineral oil enemas Digitally remove impacted stool using a lubricated, gloved finger
Intestinal Obstruction or Paralytic Ileus	Maintain strict NPO status Monitor for return of bowel sounds or change in bowel sounds and report to provider as appropriate Assess abdomen for distention, rigidity, pain, or worsening of symptoms and report to provider as appropriate Insert and/or maintain nasogastric tube as ordered

Diarrhea	Encourage oral fluid intake Maintain IV hydration as ordered Monitor for electrolyte disturbances Monitor for skin breakdown and apply skin protectants as appropriate Administer medications to slow intestinal motility as ordered and as appropriate Insert and/or maintain rectal tube as ordered
Bowel Incontinence	Engage with client using therapeutic communication Encourage client to maintain a food diary to determine if certain food cause incontinence problems Encourage increased intake of fiber to bulk up stool Assist client to toilet after meals and when client feels urge to defecate Ensure privacy during toileting Encourage the use of incontinence products as appropriate Provide client education regarding bowel retraining, including the following topics: • Teach the body to have a bowel movement at a certain time of day through scheduling consistent routines such as drinking warm fluids, eating breakfast, or scheduling a laxative every 3 days as appropriate • Do not ignore the urge to defecate • Perform pelvic floor (Kegel) exercises to regain control of anal sphincter muscle

Implementing Interventions

Assess a hospitalized client's bowel pattern and date of last bowel movement daily. Implement a bowel management plan as needed to achieve the goal of a bowel movement every one to three days to avoid constipation and

impaction. Before administering laxatives and stool softeners, always assess the client's recent stool characteristics and withhold medication if loose stools or diarrhea are occurring. In the same manner, when administering medications for a client with diarrhea, assess recent stool consistency and bowel pattern and withhold medication if the diarrhea is resolved or constipation is developing.

For many clients, alterations in elimination require health teaching on how to manage these conditions at home. Keep in mind that health teaching is an independent nursing intervention, so a provider order is not necessary to provide this important information.

Evaluation

Nurses evaluate the effectiveness of interventions based on the SMART outcomes established for each client and their circumstances. They determine if outcome criteria were met or if reassessment and/or revised interventions are required.

16.10 Putting It All Together

Client Scenario

Mrs. Jones is a 38-year-old woman who presents to the pediatrician office with her three-year-old daughter Aubrey. Mrs. Jones explains that her daughter has been experiencing infrequent bowel movements. She states, “Aubrey only passes stool one to two times per week. She strains to pass the stool and it is dry and hard when it passes.” Aubrey nods and says, “My tummy hurts a lot when that happens.”

Applying the Nursing Process

Assessment: The nurse notes the mother’s report of Aubrey experiencing increased difficulty passing stool, infrequent bowel movements, and only passing stool one to two times per week with hard, dry feces. She records Aubrey’s complaint that her “tummy hurts a lot when that happens.” The nurse assesses Aubrey’s abdomen and finds it rounded and firm with decreased bowel sounds present in all four quadrants.

Based on the assessment information that has been gathered, the nurse creates the following nursing care plan for Aubrey:

Nursing Diagnosis: *Constipation related to insufficient fluid and fiber intake as manifested by decreased stool frequency, hypoactive bowel sounds, straining with defecation, hard dry stools, and client reports “my tummy hurts a lot when that happens.”*

Overall Goal: *The client will have soft bowel movements without difficulty.*

SMART Expected Outcome: *The client will have a soft, formed stool every 24-48 hours.*

Planning and Implementing Nursing Interventions:

The nurse will provide education to the client and her mother regarding the importance of adequate fluid sources and fiber intake, in addition to medications prescribed by the provider. The nurse will encourage water for hydration and provide education regarding beverage sources that may

contribute to constipation. The nurse will discuss the value of fresh fruits, vegetables, and whole grains in diet and describe strategies for encouraging toddler consumption of these foods. The nurse will encourage scheduling regular times to attempt elimination. The nurse will provide positive reinforcement to the child regarding using of the toilet regularly for bowel elimination and encourage the mother to track bowel movements and intake using an elimination diary.

Sample Documentation:

Mother presents with the client to the clinic reporting infrequent bowel movements. She states, "Aubrey only passes stool one to two times per week. She strains to pass the stool, and it is dry and hard when it passes." The client reports, "My tummy hurts a lot when that happens." The client's abdomen is firm and round with decreased bowel sounds present in all four quadrants. Health teaching was provided to improve bowel elimination.

Evaluation:

The nurse calls Aubrey's mother in two days. The mother reports that Aubrey had a soft, formed bowel movement on each of the past two days. The SMART outcome was initially "met." The nurse encourages the mother to continue the planned interventions and to follow-up with the provider at the next clinic visit.

16.11 Learning Activities

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Activities

(Answers to "Learning Activities" can be found in the "Answer Key" at the end of the book. Answers to interactive activity elements will be provided within the element as immediate feedback.)

1. Mrs. Gonzalez is a 57-year-old woman who presents to her internal medicine provider for her annual physical. The client notes that she has been having recent increasing bouts of urinary incontinence. She reports feeling embarrassed by this condition and states, "I guess this is just a part of getting older." As the nurse providing care for Mrs. Gonzalez, what health teaching and interventions might be beneficial?

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1748#h5p-94

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1748#h5p-34

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1748#h5p-35

Test your knowledge using this NCLEX Next Generation-style bowtie question. You may reset and resubmit your answers to this question an unlimited number of times.[1]

Test your knowledge using these NCLEX Next Generation-style questions. You may reset and resubmit your answers to the questions in this assignment an unlimited number of times.[2]

1. "Chapter 16 Assignment 1" by Tami Davis for OpenRN is licensed under CC BY-NC 4.0

2. "Chapter 16 Assignment 2" by Rebecca Wicks for OpenRN is licensed under CC BY-NC 4.0

XVI Glossary

OPEN RESOURCES FOR NURSING (OPEN RN)

Anuria: Absence of urine output that is typically found during kidney failure. Can be defined as less than 50 mL of urine over a 24-hour period. (Chapter 16.2)

Black stools: Black-colored stools can be caused by iron supplements or bismuth subsalicylate (Pepto-Bismol) taken for an upset stomach. (Chapter 16.2)

Bowel incontinence: The loss of bowel control, causing the unexpected passage of stool. (Chapter 16.8)

Bowel retraining: Involves teaching the body to have a bowel movement at a certain time of the day. (Chapter 16.8)

Constipation: Infrequent or difficult evacuation of feces. (Chapter 16.6)

Contrast: A special dye administered to clients before some diagnostic tests so that certain areas show up better on the X-rays. (Chapter 16.9)

Diarrhea: More than three unformed stools in 24 hours. (Chapter 16.7)

Dysuria: Painful or difficult urination. (Chapter 16.2)

Enuresis: Incontinence when sleeping (i.e., bedwetting). (Chapter 16.2)

Fecal impaction: A condition that occurs when stool accumulates in the rectum usually due to the client not feeling the presence of stool or not using the toilet when the urge is felt. A classic sign of fecal impaction is liquid seepage of stool. Large balls of soft stool may need to be digitally removed or treated with mineral oil enemas. (Chapter 16.6)

Frequency: Urinary frequency is the need to urinate many times during the day or at night (nocturia) in normal or less-than-normal volumes. It may be accompanied by a feeling of urgency. (Chapter 16.2)

Functional incontinence: Occurs in older adults who have normal bladder control but have a problem getting to the toilet because of arthritis or other disorders that make it hard to move quickly. Clients with dementia also have increased risk for functional incontinence. (Chapter 16.4)

Hematuria: Blood in urine, either visualized or found during microscopic analysis. (Chapter 16.2)

Intestinal obstruction: A partial or complete blockage of the intestines so that contents of the intestine cannot pass through it. (Chapter 16.6)

Meconium: The black to dark green, sticky first bowel movement of a newborn. (Chapter 16.2)

Melena: Black, sticky, tar-looking stools. Melena is typically caused by bleeding in the upper part of the gastrointestinal tract, such as the esophagus, stomach, or the first part of the small intestine, or due to the client swallowing blood. The blood appears darker and tarry-looking because it undergoes digestion on its way through the GI tract. (Chapter 16.2)

Mixed urinary incontinence: Urinary frequency, urgency, and stress incontinence. (Chapter 16.4)

Nocturia: The need for a client to get up at night on a regular basis to urinate. Nocturia often causes sleep deprivation that affects a person's quality of life. (Chapter 16.2)

Occult blood: Hidden blood in the stool not visible to the naked eye. (Chapter 16.9)

Oliguria: Decreased urine output, defined as less than 500 mL urine in adults in a 24-hour period. In hospitalized clients, oliguria is further defined as less than 0.5 mL of urine per kilogram per hour for adults and children or less than 1 mL of urine per kilogram per hour for infants. (Chapter 16.2)

Overflow incontinence: Occurs when small amounts of urine leak from a bladder that is always full. This condition tends to occur in males with enlarged prostates that prevent the complete emptying of the bladder. (Chapter 16.4)

Paralytic ileus: A condition where peristalsis is not propelling the contents through the intestines. (Chapter 16.6)

Peristalsis: The involuntary contraction and relaxation of the muscles of the intestine creating wave-like movements that push the digested contents forward. (Chapter 16.2)

Polyuria: Greater than 2.5 liters of urine output over 24 hours; also referred to as diuresis. Urine is typically clear with no color. (Chapter 16.2)

Postvoid residual: A measurement of urine left in the bladder after a client

has voided by using a bladder scanner or straight catheterization. (Chapter 16.5)

Pyuria: At least ten white blood cells in each cubic millimeter of urine in a urine sample that typically indicates infection. In some cases, pus may be visible in the urine. (Chapter 16.2)

Rectal bleeding: Bright red blood in the stools; also referred to as hematochezia. (Chapter 16.2)

Stress urinary incontinence: The involuntary loss of urine on intra-abdominal pressure (e.g., laughing and coughing) or physical exertion (e.g., jumping). (Chapter 16.4)

Tarry stools: Stools that are black and sticky that appear like tar; also referred to as melena. (Chapter 16.2)

Urgency: A sensation of an urgent need to void. Urgency may be associated with urge incontinence. (Chapter 16.2)

Urge urinary incontinence: Also referred to as “overactive bladder”; urine leakage accompanied by a strong desire to void. It can be caused by increased sensitivity to stimulation of the detrusor in the bladder or decreased inhibitory control of the central nervous system. (Chapter 16.4)

Urinary retention: A condition when the client cannot empty all of the urine from their bladder. (Chapter 16.5)

PART XVII

GRIEF AND LOSS

17.1 Grief and Loss Introduction

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Objectives

- Identify anticipated responses to grief and loss across the life span
- Identify grief and loss resources
- Identify ethical/legal considerations related to end-of-life decisions
- Identify the nursing responsibilities associated with end-of-life and postmortem care
- Contribute to a plan of care to support client (individual, family, or group) through grief and loss
- Demonstrate respect for the cultural and spiritual beliefs of the client and family members experiencing grief and loss

Have you ever experienced the loss of something important to you like a job, a relationship with a friend or significant other, or a pet? We all experience loss and grief at some point in our lives, with the ultimate loss being death. Nurses are typically the first line of support as they assist clients and their family members to cope with serious illness, feelings of loss, and the end of life.

This chapter is based on a curriculum established by the End-of-Life Nursing Care Consortium (ELNEC), an international educational project

sponsored by the American Association of Colleges of Nursing. The ELNEC project gives nurses and other health care professionals the knowledge and skills required to provide specialized care and positively impact the lives of clients and families facing serious illness and/or the end of life.[1] This chapter will discuss concepts related to grief and loss and evidence-based interventions advocated by the ELNEC.

1. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

17.2 Basic Concepts

OPEN RESOURCES FOR NURSING (OPEN RN)

Three major concepts associated with grieving are loss, grief, and mourning. **Loss** is the absence of a possession or future possession with the response of grief and the expression of mourning. The feeling of loss can be associated with the loss of health, changes in relationships and roles, and eventually the loss of life. After a client dies, the family members and other survivors experience loss.[1]

Grief is the emotional response to a loss, defined as the individualized and personalized feelings and responses that an individual makes to real, perceived, or anticipated loss. These feelings may include anger, frustration, loneliness, sadness, guilt, regret, and peace. Grief affects survivors physically, psychologically, socially, and spiritually. The grief process is not orderly and predictable. Emotional fluctuation is normal and expected. There are times when the person experiencing the loss feels in control and accepting, and there are other times when the loss feels unbearable and they feel out of control.[2] See Figure 17.1[3] for an image of an individual in a cemetery who may be experiencing grief.

1. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/
2. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/
3. "Grief_and_loss_(16755561105).jpg" by Thomas8047 is licensed under CC BY 2.0

Figure 17.1 Grief

Mourning is the outward, social expression of loss. Individuals outwardly express loss based on their cultural norms, customs, and practices, including rituals and traditions. Some cultures may be very emotional and verbal in their expression of loss, such as wailing or crying loudly. Other cultures are stoic and show very little reaction to loss. Culture also dictates how long one mourns and how the mourners "should" act. The expression of loss is also affected by an individual's personality and previous life experiences.[4]

Types of Grief

There are five different categories of grief: anticipatory grief, acute grief, normal grief, disenfranchised grief, and complicated grief.

Anticipatory Grief

Anticipatory grief is defined as grief before a loss, associated with diagnosis of an acute, chronic, and/or terminal illness experienced by the client, family, or caregivers. Examples of anticipatory grief include actual or fear of potential

4. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

loss of health, independence, body part, financial stability, choice, or mental function.[5]

Sometimes anticipatory grief starts at the time of a terminal diagnosis and can proceed until the person dies. Clients and their family members can feel anticipatory loss. The client often anticipates the loss of independence, function, or comfort, which can cause significant pain and anxiety if not given the proper support. A client may also have concrete fears such as the loss of the ability to drive, live independently, or maintain their current body image. They may also have grief regarding the loss of anticipated family experiences, such as celebrating the marriage of a child, the birth of a grandchild, an anniversary, or another significant life event. The family often starts grieving for the loss of their loved one before they die as they envision their life without their loved one in it. This type of grief has been shown to help cushion a person's bereavement reaction.[6]

Acute Grief

Acute grief begins immediately after the death of a loved one and includes the separation response and response to stress. During this period of acute grief, the bereaved person may be confused and/or uncertain about their identity or social role. They may disengage from their usual activities and experience disbelief and shock that their loved one is gone.[7] See Figure 17.2[8] for an image of a sculpture depicting acute grief.

5. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/
6. Kübler-Ross, E. (1969). *On death and dying*. The Macmillan Company.
7. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/
8. "WWStoryRome.jpg" by Carptrash is licensed under CC BY-SA 3.0

Figure 17.2 Acute Grief

Normal Grief

Normal grief includes the common feelings, behaviors, and reactions to loss. Normal grief reactions to a loss can include the following:

- Physical symptoms such as hollowness in the stomach, tightness in the chest, weakness, heart palpitations, sensitivity to noise, breathlessness, tension, lack of energy, and dry mouth
- Emotional symptoms such as numbness, sadness, fear, anger, shame, loneliness, relief, emancipation, yearning, anxiety, guilt, self-reproach, helplessness, and abandonment
- Cognitive symptoms such as a state of depersonalization, confusion, inability to concentrate, dreams of the deceased, idealization of the deceased, or a sense of presence of the deceased
- Behavioral signs such as impaired work performance, crying, withdrawal, overreactivity, changed relationships, or avoidance of reminders of the deceased[9]

Acute grieving may take months but can also take years, depending on the

9. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

loss. No one ever truly gets over the loss, but there is an eventual reconnection with the world of the living as the relationship with the deceased changes.[10]

Disenfranchised Grief

Disenfranchised grief is grief over any loss that is not validated or recognized. Those affected by this type of grief do not feel the freedom to openly acknowledge their grief. Individuals at risk for disenfranchised grief are those who have lost loved ones to stigmatized illnesses or events, such as AIDS. Mothers and/or fathers may grieve over terminated pregnancies or stillborn babies. The loss of a previously severed relationship or divorce can contribute to this type of grief because the individual may not be able to mourn openly due to the circumstances surrounding the relationship.

Complicated Grief

Complicated grief occurs when there is interference in the grieving process leading to a prolonged, more intense grieving. There is often preoccupation with the circumstances of the loss, which may manifest as feelings of guilt regarding the situation around the loss. There is generally a negative focus on the loss, which overrides any positive emotions the person may feel. Complicated grieving can cause significant distress, impaired functioning, and suicidal thinking.[11] Complicated grief is seen in 10-20% of individuals experiencing the death of a romantic partner and with higher estimates for parents who have lost a child. According to the ELNEC, there are four types of

10. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

11. Shear, M. K. (2012). Grief and mourning gone awry: Pathway and course of complicated grief. *Dialogues in Clinical Neuroscience, 14*(2), 119-28. https://doi.org/10.31887/DCNS.2012.14.2/mshear.

complicated grief, including chronic grief, delayed grief, exaggerated grief, and masked grief. Risk factors for developing complicated grief include sudden or traumatic death, suicide, homicide, a dependent relationship with the deceased, chronic illness, death of a child, multiple losses, unresolved grief from prior losses, concurrent stressors, witnessing a difficult dying process such as pain and suffering, lack of support systems, and lack of a faith system. Complicated grief may require professional assistance depending on its severity. Factors that contribute to complicated grief in older adults include lack of a support network, concurrent losses, poor coping skills, and loneliness.[12]

- **Chronic Grief:** Normal grief reactions that do not subside and continue over very long periods of time.
- **Delayed Grief:** Normal grief reactions that are suppressed or postponed by the survivor consciously or unconsciously to avoid the pain of the loss.
- **Exaggerated Grief:** An intense reaction to grief that may include nightmares, delinquent behaviors, phobias, and thoughts of suicide.
- **Masked Grief:** Grief that occurs when the survivor is not aware of behaviors that interfere with normal functioning as a result of the loss. For example, an individual cancels lunch with friends so they can go to the cemetery daily to visit their loved one's grave.[13]

Stages of Grief

There are several stages of grief that may occur following a loss. It can be helpful for nurses to have an understanding of these stages to recognize the emotional reactions as symptoms of grief so they can support clients and families as they cope with loss. Famed Swiss psychiatrist Elizabeth Kubler-

12. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

13. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

Ross identified five main stages of grief in her book *On Death and Dying*.[14] Clients and families may experience these stages along a continuum, move randomly and repeatedly from stage to stage, or skip stages altogether. There is no one correct way to grieve, and an individual's specific needs and feelings must remain central to care planning.

Kuber-Ross identified that clients and families demonstrate various characteristic responses to grief and loss. These stages include denial, anger, bargaining, depression, and acceptance, commonly referred to by the mnemonic "DABDA." See Figure 17.3[15] for an illustration of the Kubler-Ross Grief Cycle. Keep in mind that these stages of grief not only occur due to loss of life, but also occur due to significant life changes such as divorce, loss of friendships, loss of a job, or diagnosis with a chronic or terminal illness.[16]

14. American Nurses Association. (2015). *Nursing: Scope and standards of practice* (3rd ed.). American Nurses Association.

15. "Kubler-ross-grief-cycle-1-728.jpg" by U3173699 is licensed under CC BY-SA 4.0

16. Oates, J. R. (2022). *Death and dying*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK536978/

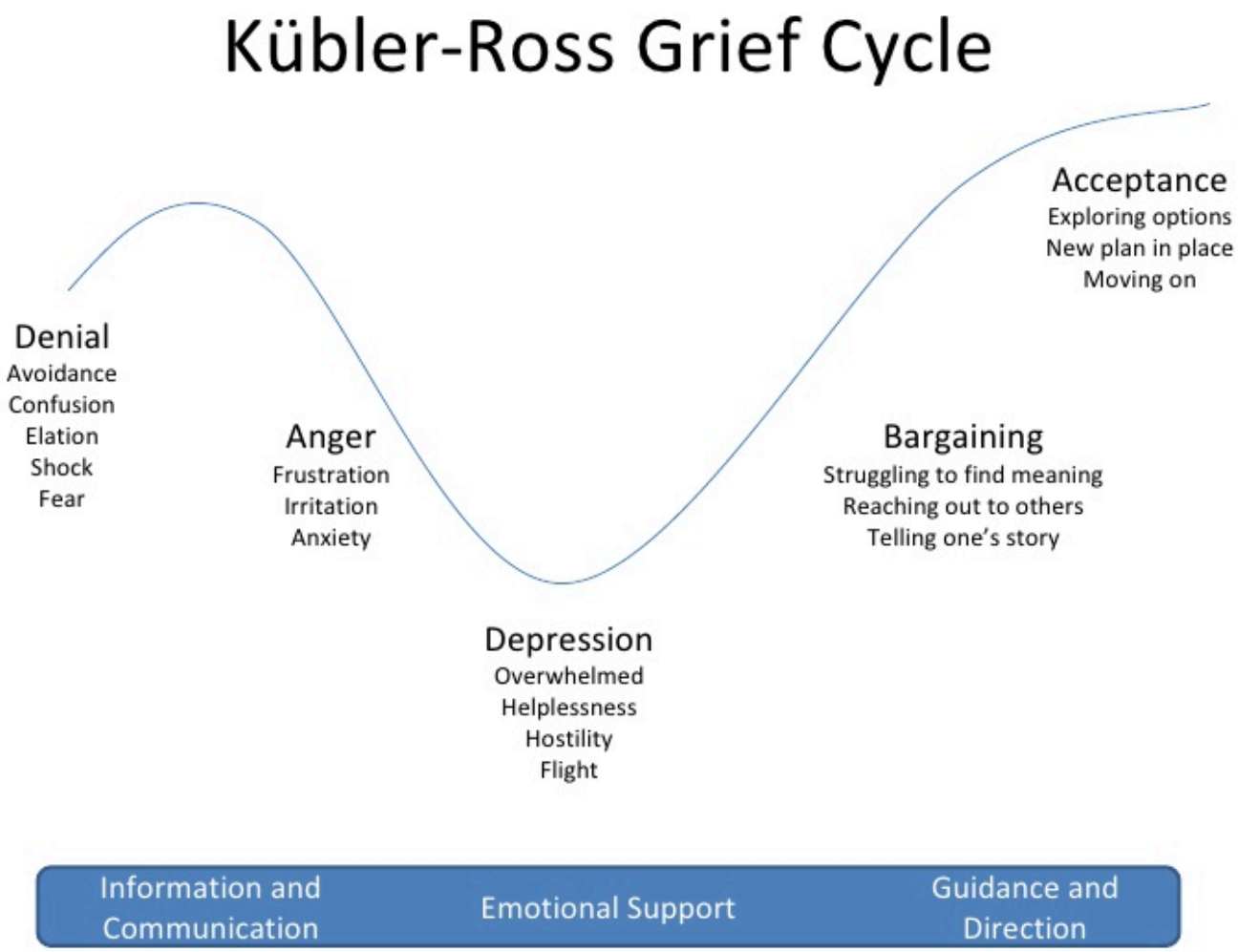

Figure 17.3 Kubler-Ross Grief Cycle

View the beginning of this YouTube video clip[17] from the

17. Movieclips. (2014, February 5). *Steel Magnolias (8/8) movie CLIP – I wanna know why (1989) HD* [Video]. YouTube. All rights reserved. https://youtu.be/iZx1W6cHw-g

movie *Steel Magnolias* that shows a mother demonstrating stages of the grieving process.

Denial

Denial occurs when the individual refuses to acknowledge the loss or pretends it isn't happening. This stage is characterized by an individual stating, "This can't be happening." The feeling of denial is self-protective as an individual attempts to numb overwhelming emotions as they process the information. The denial process can help to offset the immediate shock of a loss. Denial is commonly experienced during traumatic or sudden loss or if unexpected life-changing information or events occur. For example, a client who presents to the physician for a severe headache and receives a diagnosis of terminal brain cancer may experience feelings of denial. See Figure 17.4[18] for an image of a person depicting reaction to unexpected news with denial.

Figure 17.4 Denial

18. "Young-indian-with-disgusting-expression-showing-denial-with-hands-42509-pixahive.jpg" by Sukhjinder is licensed under CC0

Anger

Anger in the grief process often masks pain and sadness. The subject of anger can be quite variable; anger can be directed to the individual who was lost, internalized to self, or projected toward others. Additionally, an individual may lash out at those uninvolved with the situation or have bursts of anger that seemingly have no apparent cause. Health care professionals should be aware that anger may often be directed at them as they provide information or provide care. It is important that health care team members, family members, and others who become the target of anger recognize that the anger and emotion are not a personal attack, but rather a manifestation of the challenging emotions that are a part of the grief process. If possible, the nurse can provide supportive presence and allow the client or family member time to vent their anger and frustration while still maintaining boundaries for respectful discussion. Rather than focusing on what to say or not to say, allowing a safe place for a client or family member to verbalize their frustration, sorrow, and anger can offer great support. See Figure 17.5[19] for an image of a child depicting anger.

Figure 17.5 Anger

19. "Child%27s_Angry_Face.jpg" by Babyaimeesmom is licensed under CC BY-SA 4.0

Bargaining

Bargaining can occur during the grief process in an attempt to regain control of the loss. When individuals enter this phase, they are looking to find ways to change or negotiate the outcome by making a deal. Some may try to make a deal with God or their higher power to take away their pain or to change their reality by making promises to do better or give more of themselves if only the circumstances were different. For example, a client might say, "I promised God I would stop smoking if He would heal my wife's lung cancer."

Depression

Feelings of depression can occur with intense sadness over the loss of a loved one or the situation. Depression can cause loss of interest in activities, people, or relationships that previously brought one satisfaction. Additionally, individuals experiencing depression may experience irritability, sleeplessness, and loss of focus. It is not uncommon for individuals in the depression phase to experience significant fatigue and loss of energy. Simple tasks such as getting out of bed, taking a shower, or preparing a meal can feel so overwhelming that individuals simply withdraw from activity. In the depression phase, it can be difficult for individuals to find meaning, and they may struggle with identifying their own sense of personal worth or contribution. Depression can be associated with ineffective coping behaviors, and nurses should watch for signs of self-medicating through the use of alcohol or drugs to mask or numb depressive feelings. See Figure 17.6[20] for an image of a person depicting feelings of depression.

20. "Depressed_(4649749639).jpg" by Sander van der Wel is licensed under CC BY-SA 2.0

Figure 17.6 Depression

Acceptance

Acceptance refers to an individual understanding the loss and knowing it will be hard but acknowledging the new reality. The acceptance phase does not mean absence of sadness but is the acknowledgement of one's capabilities in coping with the grief experience. In the acceptance phase, individuals begin to reengage with others, find comfort in new routines, and even experience happiness with life activities again. See Figure 17.7[21] of an image of a person depicting acceptance.

21. "Contentment_at_its_best.jpg" by Neha Bhamburdekar is licensed under CC BY-SA 4.0

Figure 17.7 Acceptance

Grief Tasks

Kubler-Ross's grief stages describe many feelings that individuals commonly experience while grieving loss. Other experts also describe the grieving process in terms of tasks that one must accomplish. These tasks include notification and shock, experiencing the loss, and reintegration.[22]

- **Notification and shock:** This phase occurs when a person first learns of the loss and experiences feelings of numbness or shock. The person may isolate themselves from others while processing this information. The first task for the person to complete is to acknowledge the reality of the loss by assessing and recognizing the loss.
- **Experiencing the loss:** The second task involves experiencing the loss emotionally and cognitively. The person must work through the pain by reacting to, expressing, and experiencing the pain of separation and grief.

22. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

- **Reintegration:** The third task involves reorganization and restructuring of family systems and relationships by adjusting to the environment without the deceased. The person must form a new reality without the deceased and adapt to a new role while also retaining memories of the deceased.[23]

As a nurse, you can greatly assist clients and family members as they move through the grieving process by being willing and committed to spending time with them. Listen to their stories, be present, and bear witness to their pain. Remember that you cannot fix everything, but taking time to assess their symptoms of grief helps you identify other resources for support.

Palliative Care and Hospice

Palliative care and hospice care are specialty care areas related to the care of clients and their families experiencing loss and the grieving process.

Palliative care is a broad philosophy of care defined by the World Health Organization as improving the quality of life of clients, as well as their family members, who are facing problems associated with life-threatening illness. It prevents and relieves suffering through early identification, correct assessment, and treatment of pain and other problems, whether physical, psychosocial, or spiritual.[24] In the United States, palliative care is further described as, "Patient and family-centered care that optimizes quality of life by anticipating, preventing, and treating suffering. Palliative care occurs throughout the continuum of care and involves the interdisciplinary team collaboratively addressing physical, intellectual, emotional, social, and spiritual needs and facilitating patient autonomy, access to information, and choice."[25]

23. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

24. World Health Organization. (2020). *Palliative care*. *https://www.who.int/news-room/fact-sheets/detail/palliative-care*

25. National Hospice and Palliative Care Organization. (2021). *Explanation of*

Palliative care focuses on comfort and quality of life but also includes continuing curative treatment such as dialysis, chemotherapy, and surgery.

Hospice care is a type of palliative care that addresses care for clients who are terminally ill when a health care provider has determined they are expected to live six months or less. Like palliative care, hospice provides comprehensive comfort care and support for the family, but in hospice, curative treatments are stopped. It is based on the idea that dying is part of the normal life cycle and supports the client and family through the dying and grief process. It also supports the surviving family members through the bereavement process. Hospice care does not hasten death but focuses on providing comfort while allowing a natural death. Symptoms control, including pain relief, and quality of life are of utmost importance.

Many clients decide to receive hospice care at home with the support of family, nurses, and hospice staff, but hospice services are also available across a variety of settings such as long-term care, assisted living facilities, hospitals, and prisons. In the United States, older adults enrolled in Medicare can choose to receive hospice care and stop receiving curative treatment. It is important to remember that stopping curative treatment does not mean discontinuing all medical treatment. For example, a client with cancer who is no longer responding to chemotherapy can decide to enter hospice care and focus on comfort and quality of life. The chemotherapy treatment will stop, but other medical care, such as blood pressure medications or antibiotics to treat infection, will continue as long as they are helpful in promoting quality of life. Medicare will also pay for all related home durable medical equipment (such as a hospital bed and home oxygen therapy equipment) and all medications related to the terminal diagnosis (including pain

palliative care. https://www.nhpco.org/palliative-care-overview/explanation-of-palliative-care/

medications).[26,27] See Figure 17.8[28] for an image of a client receiving hospice care.

Figure 17.8 Hospice Care

Unfortunately, instead of viewing hospice as a care option to promote quality of life and reduce suffering, many clients and their families associate hospice care with "giving up," or as a "death sentence," and are resistant to this type of care. For this reason, many health care teams advocate the implementation of palliative care until clients and their family members are ready to discuss hospice care.

When a client and their family members make the decision to implement home hospice, their desire is for the client to comfortably spend their final days in their home environment. However, if the client's condition later becomes challenging for family members to manage at home, it can be very

26. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

27. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

28. "hospice-1761276_1280.jpg" by truthseeker08 is licensed under CC0

difficult to consider transferring the client to a hospice inpatient unit at that time. It is often helpful to encourage clients and family members to tour alternative care agencies when considering hospice and be prepared if this decision is later warranted.

Comfort Care

Comfort care is a term commonly used in the acute care setting that is similar to palliative care and hospice. Comfort care occurs when the clients and medical team's goals shift from curative intervention to symptom control, pain relief, and quality of life. However, there is no formal admission to hospice or palliative care that can impact insurance coverage. Rather than focusing on aggressive medical intervention, the focus changes to symptom control to provide the client with the greatest degree of comfort possible as they approach their end of life. When comfort care is ordered by the provider, many interventions are eliminated to promote comfort, such as administering medications (with the exception of analgesics or antianxiety medications), monitoring vital signs, or performing blood draws or other invasive procedures.

> Read more about the National Coalition for Hospice and Palliative Care's Palliative Care Guidelines.

Ethical and Legal Considerations

End-of-life care often includes unique complexities for the client, family, and nurse. There may be times when what the physician or nurse believes to be the best treatment conflicts with what the client desires. There may also be challenges related to decision-making that cause disagreements within a family or cause conflict with the treatment plan. Additional challenging factors include availability of resources and insurance company policies and programs.

Despite these complexities, it is important for the nurse to honor and respect the wishes of the client. Despite any conflicts in decision-making among health care providers, family members, and the client, the nurse must always advocate for the client's wishes. Nurses should also be aware of the practice guidelines for ethical dilemmas stated in the American Nurses Association's Standards of Professional Nursing Practice and Code of Ethics.[29,30] These resources assist the nurse in implementing expected behaviors according to their professional role as a nurse.

If complex ethical dilemmas occur, many organizations have dedicated ethics committees that offer support, guidance, and resources for complex ethical decisions. These committees can serve as support systems, share resources, provide legal insight, and make recommendations for action. The nurse should feel supported in raising concerns within their health care organization if they believe an ethical dilemma is occurring.

- Review ANA's Code of Ethics.

DO-NOT-RESUSCITATE ORDERS AND ADVANCE DIRECTIVES

Additional legal considerations when providing care at the end of life are do-not-resuscitate orders (DNR) orders and advance directives. A **do-not-resuscitate (DNR) order** is a medical order that instructs health care

29. American Nurses Association. (2015). *Code of ethics for nurses with interpretive statements*. American Nurses Association. https://www.nursingworld.org/practice-policy/nursing-excellence/ethics/code-of-ethics-for-nurses/coe-view-only/

30. National Institute on Aging. (2021). *What are palliative care and hospice care*? U.S. Department of Health & Human Services. https://www.nia.nih.gov/health/what-are-palliative-care-and-hospice-care

professionals not to perform **cardiopulmonary resuscitation (CPR)** if a client's breathing stops or their heart stops beating. The order is only written with the permission of the client (or the client's health care power of attorney, if activated.) Ideally, a DNR order is set up before a critical condition occurs. CPR is emergency treatment provided when a client's blood flow or breathing stops that may involve chest compressions and mouth-to-mouth breathing, electric shocks to stop lethal cardiac rhythms, breathing tubes to open the airway, or cardiac medications. The DNR order only refers to not performing CPR and is recorded in a client's medical record. It is crucial to understand that with a DNR order, clients are still entitled to medical treatment, such as antibiotics, IVs, and medications, and as such, treatment should be rendered when abnormalities are noted or anticipated. Wallet cards, bracelets, or other DNR documents are also available to have at home or in nonhospital settings. The decision to implement a DNR order is typically very difficult for a client and their family members to make.[31] Many people have unrealistic ideas regarding the success rates of CPR and the quality of life a client experiences after being revived, especially for clients with multiple chronic diseases or those receiving palliative care. For example, a recent study found the overall rate of survival leading to hospital discharge for someone who experiences cardiac arrest is about 10.6 percent.[32] Nurses can provide up-to-date health teaching regarding CPR and its effectiveness based on the client's current condition and facilitate discussion about a DNR order.

Advance directives are legal documents that direct care when the client can no longer speak for themselves and include a health care power of

31. U.S. National Library of Medicine. (2024). *Do-not-resuscitate order: Medlineplus medical encyclopedia*. MedlinePlus. https://medlineplus.gov/ency/patientinstructions/000473.htm

32. Ouellette, L., Puro, A., Weatherhead, J., Shaheen, M., Chassee, T., Whalen, D., & Jones, J.. (2018). Public knowledge and perceptions about cardiopulmonary resuscitation (CPR): Results of a multicenter survey. *American Journal of Emergency Medicine, 36*(10), 1900-1901. https://doi: 10.1016/j.ajem.2018.01.103.

attorney and a living will. The **health care power of attorney** legally identifies a trusted individual to serve as a decision maker for health issues when the client is no longer able to speak for themselves. It is the responsibility of this designated individual to carry out care actions in accordance with the client's wishes. A health care power of attorney can be a trusted family member, friend, or colleague who is of sound mind and is over the age of 18. They should be someone who the client is comfortable expressing their wishes to and someone who will enact those desired wishes on the client's behalf.

The health care power of attorney should also have knowledge of the client's wishes outlined in their living will. A **living will** is a legal document that describes the client's wishes if they are no longer able to speak for themselves due to injury, illness, or a persistent vegetative state. The living will addresses issues like ventilator support, feeding tube placement, cardiopulmonary resuscitation, and intubation. It is a vital means of ensuring that the health care provider has a record of one's wishes. However, the living will cannot feasibly cover every possible potential circumstance, so the health care power of attorney is vital when making decisions outside the scope of the living will document.

Read more about advance care planning at the National Institute on Aging and at Honoring Choices Wisconsin.

Nurses must understand the health care practice legalities for the state in which they practice nursing. There can be practice issues in various states that raise additional ethical complexities for the practicing nurse. For example, Oregon, Washington, Vermont, and New Mexico all have laws that allow clients to participate in assisted dying practices

involving assisted suicide or active euthanasia. In assisted suicide, the client is provided the means to carry out suicide such as a lethal dose of medication. Active euthanasia involves someone other than the client carrying out action to end a person's life. Most nursing organizations prevent a nurse from participating in assisted dying practices. Nurses must be aware of the Nurse Practice Act in their state and the legalities and ethical challenges of nursing actions surrounding complex issues such as assisted suicide, active euthanasia, and abortion.

Caring for the Family of a Dying Client

When caring for a client who is nearing the end of life, the family members require nursing care as well. **Fading away** is a transition that families make when they realize their seriously ill family member is dying. Although they may have been previously told by a health care provider that their loved one would die from the illness, there is often a sudden realization their family member "is not going to get any better" when their health begins to significantly decline. With this realization comes the transition of fading away.[33]

There are various dimensions that both clients and family members experience during this fading away process:

- **Redefining:** There is a shift for both clients and families from "what used to be" to "what is now."
- **Burdening:** As clients become more dependent, they may feel as if they are a burden to their family–physically, financially, emotionally, socially,

33. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

and spiritually. Yet, family members typically do not feel the care they are providing is a burden, but rather, "something you do for someone you love."

- **Searching for Meaning:** Clients journey inward, seek spiritual reflection, and become more connected to important family members and friends. Family members may search for meaning inwardly through spiritual reflection or explore for meaning with family members and friends.
- **Living Day to Day:** Clients who eventually find meaning in their illness live each day with a more positive attitude. Family members who try to "make the best of it" make efforts to enjoy the limited time left with their loved one.
- **Preparing for Death:** Clients often want to leave a legacy. Spouses often want to meet every need of their ill spouse. Clients and family members may begin to make prearrangements for the funeral, as well as get their will and other financial matters in order.
- **Contending with Change:** Clients and their family members change roles, social patterns, and work patterns. They know the life they used to have will soon be gone.[34]

Nurses can assist clients and family members during the fading away transition by being present and actively listening.

> An excellent resource for family members of clients during the fading away transition is a pamphlet called "Gone From My Sight – The Dying Experience" by Barbara Karnes. This pamphlet is typically provided to families when a client signs up for hospice services. It explains how people with chronic illness die in stages of months, weeks, days, and hours. It helps to answer the common question, "How long?" from clients and their family members.

34. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

Caregiver Support

Most clients with chronic illness have family caregivers that are an extension of the health care team and work around the clock, all days of the week. They typically provide 70-80% of the care at home. It is important for nurses to assess the caregiver when seeing them with the client in the home, clinic, hospital, or long-term setting and provide encouragement. It is helpful to acknowledge their work is very difficult and to praise them for their efforts.[35] See Figure 17.9[36] for an image of a mother acting as caregiver and supporting her son's health.

Figure 17.9 Caregiver Support

Research shows caregivers often have the following needs[37]:

35. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

36. "140305-M-KL110-002_(13063045524).jpg" by U.S. Department of Defense Current Photos is licensed under CC0

37. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

- Support, assistance, and practical help (e.g., finding others to assist with grocery shopping, going to the pharmacy, and food preparation)
- Honest conversations with the health care team
- Assurance their loved one is being honored
- Inclusion in decision-making
- Desire to be listened to and their concerns heard
- Remembrance as a good and compassionate caregiver
- Assurance that they did all they possibly could for their loved one

Assess the caregiver's needs for further assistance, as well as their social support network. Assess their physical needs, sleep patterns, and ability to perform other responsibilities. Watch for signs of declining health, clinical depression, or signs of increased use of alcohol and drugs. Listen to the caregiver's stories and provide presence, active listening, and touch. Assist them in identifying and using support systems and refer them to resources and support groups in the community as needed.[38]

Cultural Considerations Regarding Death

When assessing clients, family members, and caregivers, it is important to respect their values, beliefs, and traditions related to health, illness, family caregiver roles, and decision-making. Information gathered through this comprehensive assessment is used to develop a nursing care plan that incorporates culturally sensitive resources and strategies to meet the needs of

38. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

clients and their family members.[39] See Figure 17.10[40] for an image depicting a community grieving.

Figure 17.10 Community Grieving

Nurses can acquire knowledge about how different cultural beliefs influence a client and their family members' decision-making, approach to illness, pain, spirituality, grief, dying, death, and bereavement. See Table 17.2 for a brief comparison of various spiritual beliefs about death.[41,42]

To learn more about holistic nursing care that addresses the spiritual needs of clients and their significant others, refer to the "Spirituality" chapter.

39. American Association of Colleges of Nursing. (2021). *End-of-life-care (ELNEC).* https://www.aacnnursing.org/ELNEC

40. "Mourning_in_Shanghai_(1).jpg" by Medalofdead is licensed under CC BY-SA 4.0

41. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

42. Pasero, C., & MacCaffery, M. (2010). *Pain assessment and pharmacological management* (1st ed.). Mosby.

Table 17.2 Comparison of Spiritual Beliefs about Death[43]

43. Pasero, C., & MacCaffery, M. (2010). *Pain assessment and pharmacological management* (1st ed.). Mosby.

Religion	Beliefs Pertaining to Death	Preparation of the Body	Funeral
Christian (Catholic and Protestant)	Belief in Jesus Christ, the Bible, and an afterlife are central, although differences in interpretation exist in the various denominations. Catholics receive a sacrament called “anointing of the sick” when approaching the end of life.	Organ donation and autopsy are permitted.	Individuals are buried in cemeteries. Some denominations accept cremation as an alternative. Funerals or celebration of life services are typically held in a funeral home or church.
Jewish	Tradition cherishes life but death itself is not viewed as a tragedy. Views on an afterlife vary with the denomination (Reform, Conservative, or Orthodox).	Autopsy and embalming are forbidden under ordinary circumstances. Open caskets are not permitted.	Funeral is held as soon as possible after death. Dark clothing is worn at the funeral and after burial. It is forbidden to bury the deceased on the Sabbath or during festivals. Three mourning periods may be held after the burial, with Shiva being the first that occurs seven days after burial.
Buddhist	Both a religion and way of life with the goal of enlightenment. Life is believed to be a cycle of death and rebirth.	Goal is a peaceful death. Statue of Buddha may be placed at the bedside as the person is dying. Organ donation is not permitted. Incense is lit in the room following death.	Family washes and prepares the body after death. Cremation is preferred, but if buried, deceased are typically dressed in regular daily clothes instead of fancy clothing. Monks may be present at the funeral and lead the chanting.

Native American	Beliefs vary among tribes. Sickness is thought to mean that one is out of balance with nature. It is thought that ancestors can guide the deceased. Death is perceived as a journey to another world. Family may or may not be present for death.	Preparation of the body may be done by family. Organ donation is generally not preferred.	Various practices differ with tribes. Among the Navajo, hearing an owl or coyote is a sign of impending death, and the casket is left slightly open so the spirit can escape. Navajo and Apache tribes believe that spirits of the deceased can haunt the living. The Comanche tribe buries the dead in the place of death when possible or in a cave.
Hindu	Beliefs include reincarnation where a deceased person returns in the form of another, as well as Karma.	Organ donation and autopsy are acceptable. Death and dying must be peaceful. It is customary for the body to not be left alone until cremated.	Prefer cremation within 24 hours after death. Ashes are often scattered in sacred rivers.
Muslim	Believe in an afterlife and that the body must be quickly buried so that the soul may be freed.	Embalming and cremation are not permitted. Autopsy is permitted for legal or medical reasons only. After death, the body should face Mecca or the East. The body should be prepared by a person of the same gender.	Burial takes place as soon as possible. Women and men sit separately at the funeral. Flowers and excessive mourning are discouraged. The body is usually buried in a shroud and is buried with the head pointing toward Mecca.

Read more about funeral traditions around the globe: Death is not the end: Fascinating funeral traditions from around the globe.

A Good Death

Death is a physical, psychological, social, and spiritual event. Family members who witness the last weeks, days, hours, and minutes of their loved one's life will remember the death for all their lives. Although death is often perceived negatively in the American culture, research has found several themes that define a "good death" when nurses and the interdisciplinary team are caring for dying clients and their families:[44]

- Client preferences are met, including preferences for the dying process (i.e., where and with whom) and preparation for death (i.e., advanced directives, funeral arrangements).
- The client is pain-free with emotional well-being.
- The family is prepared for death and supportive of client's preferences.
- Dignity and respect are demonstrated for the client.
- The client has a sense of life completion (i.e., saying goodbye and feeling life was well-lived).
- Spirituality and religious comfort are provided.
- Quality of life was maintained (i.e., maintaining hope, pleasure, gratitude).
- There is a feeling of trust/support/comfort from the nurse and interdisciplinary team.[45]

Nurses are often present during these final days and moments with clients during this difficult and sacred time.[46] Read more about nursing care

44. Karnes, B. (2009). *Gone from my sight: The dying experience*. Barbara Karnes Books.

45. Karnes, B. (2009). *Gone from my sight: The dying experience*. Barbara Karnes Books.

46. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

performed during this time in the "Nursing Care During the Final Hours of Life" section.

Bereavement

The **bereavement period** includes grief (the inner feelings) and mourning (the outward reactions) after a loved one has died. A bereavement period is the time it takes for the mourner to feel the pain of the loss, mourn, grieve, and adjust to the world without the presence of the deceased. Bereavement can take a physical toll on a survivor. It is associated with an increased risk of myocardial infarction and cardiomyopathy for survivors, and widows and widowers have an increased chance of dying after their spouses die.[47] See Figure 17.11[48] for an image depicting bereavement by family members.

Figure 17.11 Bereavement

A bereaved person should be encouraged to talk about the death and understand their feelings are normal. They should allow for sufficient time for

47. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

48. "Mourning,_Lette_Valeska.jpg" by Lette Valeska is licensed under CC BY-SA 3.0

expression of grief and should postpone significant decisions such as changing jobs or moving. It is also important to encourage them to focus on their spirituality to enhance coping during this difficult time.[49] See Figure 17.12[50] for an image a person depicting one type of spirituality.

Figure 17.12 Spirituality

Americans often deny the need to express grief or feel the pain that accompanies a loss. However, although painful, both are beneficial to healing. As part of the interdisciplinary health team, nurses are often at the front line of helping clients and family members cope with their feelings of loss and grief. The nursing role during the bereavement period includes the following[51]:

49. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

50. "meditation-1350599_960_720.jpg" by brenkee is licensed under CC0.

51. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

- Assisting with enhanced coping mechanisms
- Assessing and facilitating spirituality
- Facilitating the grieving process by supporting the client and survivors to feel the loss, express the loss, and move through the tasks of grief
- Communicating assessments and interventions with the interdisciplinary team

Children

Children who have experienced the loss of a parent, sibling, grandparent, or friend experience grief based on their developmental stage. It can be normal grief or complicated grief. Children may be limited in their ability to verbalize and describe their feelings and grief. See Figure 17.13[52] for an image of a child depicting grief.

Figure 17.13 Grieving Child

Symptoms of grief in younger children include nervousness, uncontrollable

52. "sad-72217_960_720.jpg" by PublicDomainPictures is licensed under CC0

rages, frequent illness, incontinence, rebellious behavior, hyperactivity, nightmares, depression, compulsive behavior, memories fading in and out, excessive anger, overdependence on the remaining parent, denial, and/or disguised anger. Children may not understand that death is permanent until they are in preschool or older. It is important to use the word "death" and not euphemisms like "gone to sleep" or "gone away," which can be confusing or ambiguous to children. Additionally, using these euphemisms may cause children to fear sleep.[53]

Symptoms of grief in older children include difficulty concentrating, forgetfulness, decreased academic performance, insomnia or sleeping too much, compulsiveness, social withdrawal, antisocial behavior, resentment of authority, overdependence, regression, resistance to discipline, suicidal thoughts or actions, nightmares, symbolic dreams, frequent sickness, accident proneness, overeating or undereating, truancy, experimentation with alcohol or drugs, depression, secretiveness, sexual promiscuity, or running away from home.[54]

Play is the universal language of children, so nurses should use it therapeutically when possible. Encouraging children that their grief is "normal" gives them comfort. Refer children, parents, and families to grief specialists as indicated. Make sure families are aware of local support groups.[55]

Parents and Grandparents

For parents, the death of a child can be devastating with a great need for

53. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

54. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

55. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

bereavement support. For grandparents, the grief can be twofold as they experience their own grief, in addition to witnessing the grief of their child (the parent). Studies have shown that grandparents' grief is seldom acknowledged.[56] See Figure 17.14[57] for an image of a sculpture depicting mourning for a child.

Figure 17.14 Mourning for a Child

> For more information on support for parents experiencing infant loss, go to National Share's Pregnancy & Infant Loss Support web page.

Spouses

The death of a husband or wife is well recognized as an emotionally

56. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

57. "Sarcophagus,_marble,_mourning_for_child,_100-200_AD,_AM_Agrigento,_121062.jpg" by Zde is licensed under CC BY-SA 4.0

devastating event, being ranked on life event scales as the most stressful of all possible losses. The intensity and persistence of the pain associated with this type of bereavement is thought to be due to the emotional marital bonds linking husbands and wives to each other. Spouses are co-managers of home and family, companions, sexual partners, and fellow members of larger social units.

Therapeutic Communication Tips

When communicating with the bereaved, it is more important to listen and be present rather than say the "right words." It is also helpful to simply encourage silence. However, certain phrases should be avoided because they can create barriers in therapeutic communication:

- Avoid statements like, "I know/can imagine/understand how you feel." Even if you have been through a similar situation, you don't know how the survivor feels. Instead say, "This must be very difficult for you. Would you like to talk about it?"
- Don't minimize the individual's grief reaction with a statement like, "You should be over this by now." Instead, say, "This process takes time, so don't feel as if you need to rush through it."
- Avoid statements that minimize the significance of the loss, such as, "At least you had a good life with them," or "They're in a better place now." Instead, focus on exploring their feelings related to the loss, such as, "Tell me what your relationship was like."[58]

Completion of the Grieving Process

Grief work is never completely finished because there will always be times when a memory, object, song, or anniversary of the death will cause feelings

58. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

of loss for the survivor. However, healing occurs and is characterized by the following:

- The pain of the loss is lessened.
- The survivor has adapted to life without the deceased.
- The survivor has physically, psychologically, and socially "let go."[59]

Letting go is a difficult process. One can let go and still find love and true meaning in the relationship they had with their loved one. Letting go does not mean cutting oneself off from the memories, but adapting to the loss and the continued bonds with the deceased.[60] See Figure 17.15[61] for a depiction of letting go by lighting a candle in memory of the deceased.

Figure 17.15 Letting Go

59. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

60. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

61. "Candle_burning.jpg" by NCCo at English Wikipedia is licensed under CC BY-SA 3.0

Self-Care

It is important for nurses to recognize that providing end-of-life care can have a significant impact on them. A nurse's grief might be exacerbated when client loss is unexpected or is the result of a traumatic experience. For example, an emergency room nurse who provides care for a child who died as a result of a motor vehicle accident may find it difficult to cope with the loss and resume their normal work duties.

Grief can also be compounded when loss occurs repeatedly in one's work setting or after providing care for a client for a long period of time. In some health care settings, especially during the COVID-19 pandemic, nurses do not have time to resolve grief from a loss before another loss occurs. Compassion fatigue and burnout occur frequently with nurses and other health care professionals who experience cumulative losses that are not addressed therapeutically.

Compassion fatigue is a state of chronic and continuous self-sacrifice and/or prolonged exposure to difficult situations that affect a health care professional's physical, emotional, and spiritual well-being. This can lead to a person being unable to care for or empathize with someone's suffering. **Burnout** can be manifested physically and psychologically with a loss of motivation. It can be triggered by workplace demands, lack of resources to do work professionally and safely, interpersonal relationship stressors, or work policies that can lead to diminished caring and cynicism.[62] See Figure 17.16[63] for an image depicting a nurse at home experiencing burnout due to exposure to multiple competing demands of work, school, and family responsibilities.

62. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

63. "Burnout_At_Work_-_Occupational_Burnout.jpg" by Microbiz Mag is licensed under CC BY 2.0

Figure 17.16 Burnout

Self-care is important to prevent compassion fatigue and burnout. It is important for nurses to recognize the need to take time off, seek out individual healthy coping mechanisms, or voice concerns within their workplace. Prayer, meditation, exercise, art, and music are examples of healthy coping mechanisms that nurses can use to progress through their individual grief experience. Additionally, many organizations sponsor employee assistance programs that provide counseling services. These programs can be of great value and benefit in allowing individuals to voice their individual challenges with client loss. In times of traumatic client loss, many organizations hold debriefing sessions to allow individuals who participated in the care to come together to verbalize their feelings. These sessions are often held with the support of chaplains to facilitate individual coping and verbalization of feelings. (Read more about the role of chaplains in the "Spirituality" chapter.)

Throughout your nursing career, there will be times to stop and pay attention to warning signs of compassion fatigue and burnout. Here are some questions to consider:

- Has my behavior changed?
- Do I communicate differently with others?
- What destructive habits tempt me?
- Do I project my inner pain onto others?[64]

By becoming self-aware, you can implement self-care strategies to prevent compassion fatigue and burnout. Use the following "A's" to assist in building resilience, connection, and compassion:

- **Attention:** Become aware of your physical, psychological, social, and spiritual health. What are you grateful for? What are your areas of improvement? This protects you from drifting through life on autopilot.
- **Acknowledgement:** Honestly look at all you have witnessed as a health care professional. What insight have you experienced? Acknowledging the pain of loss you have witnessed protects you from invalidating the experiences.
- **Affection:** Choose to look at yourself with kindness and warmth. Affection prevents you from becoming bitter and "being too hard" on yourself.
- **Acceptance:** Choose to be at peace and welcome all aspects of yourself. By accepting both your talents and imperfections, you can protect yourself from impatience, victim mentality, and blame.[65]

In addition to self-care strategies, it is helpful for nurses to obtain additional education in end-of-life care. See the following for more information about obtaining a palliative care certificate for your portfolio.

> Read more about online end-of-life curriculum available on the American Association of Colleges of Nursing's End-of-Life-Care Curriculum web page.

64. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

65. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

17.3 Applying the Nursing Process to Grief

OPEN RESOURCES FOR NURSING (OPEN RN)

Grieving a loss is a normal process that has implications for both client and family well-being. NANDA formally recognizes the dimensions of grief with the nursing diagnoses of *Grieving* and *Complicated Grieving*. Recall that grief can be experienced due to many types of loss, in addition to death. For example, when clients receive a diagnosis of breast cancer, they may demonstrate signs of various stages of grief, such as denial, anger, bargaining, depression, and acceptance. When undergoing mastectomy and chemotherapy, the client may grieve over the loss of prior body image.

Communities can also experience grief. For example, when a town experiences a significant tragedy, such as a devastating flood or a tornado, there can be widespread community grief as families grieve the loss of life, property, or a previous way of life. In these situations, nurses must be cognizant of the multiple factors that may impact an individual's health and grieving process. Identifying these factors can help ensure that appropriate resources are mobilized to facilitate coping and progression through the grief process.

Assessment

Grief assessment includes the client, family members, and significant others. It begins when a client is diagnosed with an acute, chronic, or terminal illness and/or when the client is admitted to a hospital, nursing facility, or assisted living facility. It continues throughout the course of a terminal illness for the client, family members, and significant others and then continues through

the bereavement period for the survivors. During the bereavement period, the nurse monitors for symptoms of complicated grief.[1]

Grief can be manifested by physical, emotional, and cognitive symptoms. Physical symptoms can occur, such as feeling ill, headaches, tremors, muscle aches, exhaustion, insomnia, loss of appetite, or weight loss or gain. Cognitive symptoms may occur, such as lack of concentration, confusion, and hallucinations. Emotional symptoms, such as anxiety, guilt, anger, fear, sadness, helplessness, or feelings of relief may occur. These symptoms of grief and loss can be manifested in many different ways and can vary from day to day. Manifestations of grief are unique to the individual and may be influenced by one's age, culture, resources, and previous experiences with loss. Additionally, as clients cope with grief and loss, it is important for the nurse to recognize that support is often needed by their family members.[2]

Any behavior that may endanger the client or family should be reported to the health care provider, such as symptoms of depression, suicidal ideation, or symptoms lasting greater than six months.

Diagnoses

Consult a nursing care planning resource when selecting nursing diagnoses for clients and their family members experiencing grief. See Table 17.3 for the definition and selected defining characteristics of the NANDA-I diagnosis *Maladaptive Grieving* while also keeping in mind the previous discussion in this chapter regarding stages and tasks of normal grief.

Table 17.3 NANDA-I Maladaptive Grieving Nursing Diagnosis[3]

1. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/
2. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/
3. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses:*

NANDA-I Diagnosis	Definition	Selected Defining Characteristics
Maladaptive Grieving	A disorder that occurs after the death of a significant other, in which the experience of distress accompanying bereavement fails to follow sociocultural expectations.	• Anxiety • Decreased role performance • Depressive symptoms • Expresses anger or being overwhelmed • Expresses feeling of emptiness • Gastrointestinal symptoms • Longing for the deceased person

Examples

See the following example of a PES statement related to *Maladaptive Grieving:*

- A client's husband died two years ago, and she continues to be preoccupied with thoughts about her husband. Her grown children live several hours away, and she becomes isolated and unable to complete daily activities, such as cleaning the house and grocery shopping. A sample PES statement is: *"Maladaptive Grieving related to excessive emotional disturbance as evidenced by decreased role performance and preoccupation with thoughts about her deceased husband."* The nurse

Definitions and classification 2021-2023, Twelfth Edition. Thieme Publishers New York.

would plan interventions to facilitate grief work while also arranging for assistance with ADLs in the client's home.

Outcome Identification

Goal setting and outcome identification for clients and family members experiencing grief are customized to the specific situation and focus on grief resolution. Grief resolution is evidenced by the following indicators[4]:

- Resolves feelings about the loss
- Verbalizes reality and acceptance of loss
- Maintains living environment
- Seeks social support

For the nursing diagnosis of *Grieving* and *Complicated Grieving*, a sample goal is, "*The client will experience grief resolution.*"

A sample SMART outcome is, "*The client will discuss the meaning of the loss to their life in the next two weeks.*"[5]

Planning and Implementing Interventions

Nurses are in the ideal position to assist clients with identifying and expressing their feelings related to loss. The most important intervention that nurses can provide is active listening and offering a supportive presence. Actively listening to the bereaved helps them express their feelings and relate the emotions and feelings related to the loss. Interventions to facilitate grief

4. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 144-147, 434-444.

5. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 144-147, 434-444.

resolution focus on coping enhancement, anticipatory grieving interventions, and grief work facilitation.

Coping Enhancement

Interventions to enhance coping can be implemented for clients and families experiencing any type of actual, anticipated, or perceived loss. Sample interventions include the following[6]:

- Assist the client in identifying short- and long-term goals.
- Assist the client in examining available resources to meet the goals.
- Assist the client in breaking down complex steps into small, manageable steps.
- Encourage relationships with others who have common interests and goals.
- Assist the client to solve problems in a constructive manner.
- Appraise the effect of a client's life situation on roles and relationships.
- Appraise and discuss alternative responses to the situation.
- Use a calm, reassuring approach.
- Provide an atmosphere of acceptance.
- Help the client identify information they are most interested in obtaining.
- Provide factual information regarding medical diagnosis, treatment, and prognosis.
- Provide the client with realistic choices about certain aspects of care.
- Encourage an attitude of realistic hope as a way of dealing with hopelessness.
- Seek to understand the client's perspective of a stressful situation.
- Discourage decision-making when the client is under severe stress.

6. National Cancer Institute. (n.d.). *Grief, bereavement, and coping with loss (PDQ) – Health professional version*. U.S. Department of Health and Human Services. https://www.cancer.gov/about-cancer/advanced-cancer/caregivers/planning/bereavement-hp-pdq#section/all

- Acknowledge the client's cultural and spiritual background and encourage use of spiritual resources, if desired.
- Encourage verbalization of feelings, perceptions, and fears.
- Encourage family involvement, as appropriate.
- Assist the client to identify positive strategies to deal with limitations and manage needed lifestyle or role changes.
- Instruct the client on the use of relaxation techniques.

See Figure 17.17[7] for an image of a nurse enhancing a client's ability to cope with their illness through active listening and touch.

Figure 17.17 Coping Enhancement

Anticipatory Grieving Interventions

Anticipatory grieving refers to a grief reaction that occurs in anticipation of an impending loss. Recall that anticipatory grieving can be related to impending death of oneself or a loved one, but it can also occur in anticipation of other losses, such as the loss of a body part due to scheduled surgery or the loss of

7. "423588130-huge.jpg" by Jacob Lund is used under license from Shutterstock.com

one's home due to a move to a long-term care facility. Interventions to facilitate resolution of anticipatory grieving include the following[8]:

- Develop a trusting relationship with the client and family members by using presence and other therapeutic communication techniques.
- Keep the client and family members apprised of the client's ongoing condition as much as possible.
- Keep the family informed of the client's needs for physical care and support in symptom control, and inform them about health care options at the end of life, including palliative care, hospice care, and home care.
- Actively listen as the client grieves for their own death or loss. Normalize the client's expressions of grief.
- Discuss the client's preferred place of death and document their wishes.
- Ask family members about having adequate resources to care for themselves and the critically ill family member.
- Recognize caregiver role strain in family members providing long-term care at home.
- Listen to the family member's story.
- Encourage family members to show their caring feelings and talk with the family members.
- Recognize and respect different feelings and wishes from the client and their family members.
- Refer the client and family members to counselors or chaplains for spiritual care as appropriate.

8. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 144-147, 434-444.

Grief Work Facilitation

Grief work facilitation assists clients and family members in resolution of a significant loss. Sample interventions include the following[9]:

- Identify the loss.
- Assist the client to identify the initial reaction to the loss.
- Listen to expressions of grief.
- Encourage discussion of previous loss experiences.
- Encourage the verbalization of memories of the loss.
- Make empathetic statements about grief.
- Encourage identification of greatest fears concerning the loss.
- Educate about stages and tasks of the grieving process, as appropriate.
- Support progression through personal grieving stages.
- Assist in identifying personal coping strategies.
- Encourage implementation of cultural, religious, and social customs associated with the loss.
- Answer children's questions about the loss and encourage discussion of feelings.
- Identify sources of community support.
- Reinforce progress made in the grieving process.
- Assist in identifying modifications needed in lifestyle.

Community Resources

Bereavement follow-up with families is a component of hospice programs and includes formal activities and events to promote closure and acceptance. Many hospices have nondenominational memorial services to honor clients.

9. National Cancer Institute. (2024). *Grief, bereavement, and coping with loss (PDQ) – Health professional version*. U.S. Department of Health and Human Services. https://www.cancer.gov/about-cancer/advanced-cancer/caregivers/planning/bereavement-hp-pdq#section/all

Family members and staff are invited to participate, which can be effective at helping individuals find closure. Other formal types of support can include organized support groups to facilitate discussion and coping. Individual, group counseling, or psychotherapy are other methods that can assist the bereaved in coping with their loss. See additional resources for family members in the following box.

Additional Resources for Grief and Loss

- AARP
- National Hospice and Palliative Care Organization's Caring Info program
- National Association for Home Care & Hospice
- Hospice Foundation of America
- International Association for Hospice & Palliative Care

Clients and family members experiencing depression or anxiety related to the grieving process may be prescribed antianxiety medications or antidepressants. See the "Central Nervous System" chapter in Open RN *Nursing Pharmacology, 2e* for additional information about these medications.

Evaluation

It is always important to evaluate the effectiveness of interventions implemented. Nurses assess the effectiveness of interventions in helping individuals cope and work through the grief process based on the customized outcome criteria established for their situation.

17.4 Palliative Care Management

OPEN RESOURCES FOR NURSING (OPEN RN)

Now that we have discussed basic concepts and the nursing process related to the grieving process, let's discuss more details regarding providing palliative care. Nurses provide palliative care whenever caring for clients with chronic disease. As the disease progresses and becomes end-stage, the palliative care they provide becomes even more important. As previously discussed in the "Basic Concepts" section, palliative care is client and family-centered care that optimizes quality of life by anticipating, preventing, and treating suffering. Palliative care occurs throughout the continuum of care and involves the interdisciplinary team collaboratively addressing physical, intellectual, emotional, social, and spiritual needs and facilitating client autonomy, access to information, and choice."[1]

Providing care at the end of life is similar for clients with a broad variety of medical diagnoses. It addresses multiple dimensions of care, including physical, psychological, social, and spiritual aspects:

- **Physical:** Functional ability, strength/fatigue, sleep/rest, nausea, appetite, constipation, and pain
- **Psychological:** Anxiety, depression, enjoyment/leisure, pain, distress, happiness, fear, and cognition/attention
- **Social:** Financial burden, caregiver burden, roles/relationships, affection, and appearance
- **Spiritual:** Hope, suffering, the meaning of pain, religiosity, and

1. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

transcendence[2]

The interdisciplinary team manages pain and other symptoms, assists with difficult medical decisions, and provides additional support to clients, family members, and caregivers. Nurses have the opportunity to maintain hope for clients and family members by providing excellent physical, psychosocial, and spiritual palliative care. Nursing interventions begin immediately after the initial medical diagnosis and continue throughout the continuum of care until the end of life. As a client approaches end-of-life care, nursing interventions include the following:

- Eliciting the client's goals for care
- Listening to the client and their family members
- Communicating with members of the interdisciplinary team and advocating for the client's wishes
- Managing end-of-life symptoms
- Encouraging reminiscing
- Facilitating participating in religious rituals and spiritual practices
- Making referrals to chaplains, clergy, and other spiritual support[3]

While providing palliative care, it is important to remain aware that some things cannot be "fixed":

- We cannot change the inevitability of death.
- We cannot change the anguish felt when a loved one dies.
- We must all face the fact that we, too, will die.
- The perfect words or interventions rarely exist, so providing presence is vital.[4]

2. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

3. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

- The Palliative Care Network of Wisconsin contains excellent resources for nurses providing care for seriously ill clients.
- View the "Fast Facts" page for extensive information about palliative care and end-of-life topics.

Management of Common Symptoms

Many clients with serious, life-limiting illnesses have common symptoms that the nurse can assess, prevent, and manage to optimize their quality of life. These symptoms include pain, dyspnea, cough, anorexia and cachexia, constipation, diarrhea, nausea and vomiting, depression, anxiety, cognitive changes, fatigue, pressure injuries, seizures, and sleep disturbances. Good symptom management improves quality of life and functioning at all states of chronic illness. Nurses play a critical role in recognizing these symptoms and communicating them to the interdisciplinary team for optimal management. The plan of care should always be based on the client's goals and their definition of quality of life.[5] These common symptoms are discussed in the following subsections.

Pain

Pain is frequently defined as "whatever the experiencing person says it is,

4. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/
5. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

existing whenever they say it does."[6] When a client is unable to verbally report their pain, it is important to assess nonverbal and behavioral indicators of pain. The goal is to balance the client's desire for pain relief, along with their desire to manage side effects and oversedation. There are many options available for analgesics. Reassure a client that reaching their goal of satisfactory pain relief is achievable. Read more about pain management in the "Comfort" chapter. See Figure 17.18[7] for an image illustrating a client experiencing pain.

Figure 17.18 Pain

Dyspnea

Dyspnea is a subjective experience of breathing discomfort and is the most reported symptom by clients with life-limiting illness. Dyspnea can be

6. Pasero, C. (2018). In memoriam: Margo McCaffery, *American Journal of Nursing, 118*(3), 17. https://doi: 10.1097/01.NAJ.0000530929.65995.42

7. "a0dcf563-9393-4606-8302-c8f649e43895_rw_1200.jpg" by Flóra Borsi is licensed under CC BY-NC-ND 4.0

extremely frightening. Assessing dyspnea can be challenging because the client's respiratory rate and oxygenation status do not always correlate with the symptom of breathlessness.[8] See Figure 17.19[9] for an image of a client depicting chest pain and dyspnea.

Figure 17.19 Dyspnea

When assessing dyspnea, include the following components[10]:

- Ask the client to rate the severity of their breathlessness on a scale of 0-10
- Assess their ability to speak in sentences, phrases, or words
- Assess the client's anxiety
- Observe respiratory rate and effort
- Measure oxygenation status (i.e., pulse oximetry or ABG)
- Auscultate lung sounds
- Assess for the presence of chest pain or other pain
- Assess factors that improve or worsen breathlessness

8. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/
9. "1737708011-huge" by CGN089 is used under license from Shutterstock.com
10. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

- Evaluate the impact of dyspnea on functional status and quality of life

If you suspect that new dyspnea is caused by an acute condition, report assessment findings immediately to a health care provider. Remember that acute illnesses are still addressed and treated for clients receiving palliative care. However, in end-stage disease, dyspnea can be a chronic condition that is treated with pharmacological and nonpharmacological management. Relatively small doses of opioids can be used to improve dyspnea while having little impact on respiratory status or a client's life expectancy. Opioids help dilate pulmonary blood vessels, allowing more blood to flow to the lungs and lessening the work of breathing. The dosage should be titrated to the client's desired goals for relief of dyspnea without over sedation.

Nonpharmacological interventions for dyspnea include pursed-lip breathing, energy conservation techniques, fans and open windows to circulate air, elevation of the client bed, placing the client in a tripod position, and relaxation techniques such as music and a calm, cool environment. Health teaching can also reduce anxiety.[11] Read more about nonpharmacological interventions for dyspnea in the "Oxygenation" chapter.

Cough

A cough can be frustrating and debilitating for a client, causing pain, fatigue, vomiting, and insomnia. See Figure 17.20[12] for an image of a person depicting a chronic cough. Coughing is frequently present in advanced diseases such as chronic obstructive pulmonary disease (COPD), heart failure (HF), cancer, and AIDS. Medications that can be used to control a cough are opioids, dextromethorphan, and benzonatate. Guaifenesin can be used to thin thick

11. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

12. "1728210124-huge.jpg" by Pheelings media is used under license from Shutterstock.com

secretions, and anticholinergics (such as scopolamine) can be used for high-volume secretions.

Figure 17.20 Cough

Anorexia and Cachexia

Anorexia (loss of appetite or loss of desire to eat) and **cachexia** (wasting of muscle and adipose tissue due to lack of nutrition) are commonly found in advanced disease. See Figure 17.21[13] for an image of a client with cachexia. Weight loss is present in both conditions and is associated with decreased survival. Unfortunately, aggressive nutritional treatment does not improve survival or quality of life and can actually create more discomfort for the client as body systems begin to shut down as death approaches.[14]

13. "hospice-1794912_960_720.jpg" by truthseeker08 is licensed under CC0

14. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

Figure 17.21 Cachexia

Assessment of anorexia and cachexia focuses on understanding the client's experience and concerns, as well as determining potentially reversible causes. Referral to a dietician may be needed. Read more about nutritional assessment in the "Nutrition" chapter.

Interventions for anorexia and cachexia should be individualized for each client with the goal being eating for pleasure for those at the end of life. Clients should be encouraged to eat their favorite foods, as well as select foods that are high in calories and easy to chew. Small, frequent meals with pleasing food presentation are important. Family members should be aware that odors associated with cooking can inhibit eating. The client may need to be moved away from the kitchen or cooking times separated from eating times.[15]

Medication may be prescribed to increase intake, such as mirtazapine or olanzapine. Prokinetics such as metoclopramide may be helpful in increasing gastric emptying. Medical marijuana or dronabinol may also be useful to

15. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

stimulate appetite and reduce nausea. In some cases, enteral nutrition is helpful for clients who continue to have an appetite but cannot swallow.[16]

Health teaching for clients and family members about anorexia at the end of life is important. Nurses should be aware that many family members perceive eating as a way to "get better" and are distressed to see their loved one not eat. After listening respectfully to their concerns, explain that the client may feel more discomfort when forcing themselves to eat.

Constipation

Constipation is a frequent symptom in many clients at the end of life for many factors, such as low intake of food and fluids, use of opioids, chemotherapy, and impaired mobility. Constipation is defined as having less than three bowel movements per week. The client may experience associated symptoms such as rectal pressure, abdominal cramps, bloating, distension, and straining. See Figure 17.22[17] for an image of a client depicting symptoms of constipation.

Figure 17.22 Constipation

16. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

17. "abdominal-pain-2821941_960_720.jpg" by derneuemann is licensed under CC0

The goal is to establish what is considered normal for each client and to have a bowel movement at least every 72 hours regardless of intake. Treatment includes a bowel regimen such as oral stool softeners (i.e., docusate) and a stimulant (i.e., sennosides). Rectal suppositories (i.e., bisacodyl) or enemas should be considered when oral medications are not effective, or the client can no longer tolerate oral medications.[18]

Read more about managing constipation in the "Elimination" chapter.

Diarrhea

Diarrhea is defined as having more than three unformed stools in 24 hours. Diarrhea can be especially problematic for clients receiving chemotherapy, pelvic radiation, or treatment for AIDS because diarrhea is a common side effect of these treatments. It can cause dehydration, skin breakdown, and electrolyte imbalances and dramatically affect a person's quality of life. It can also be a burden for caregivers due to frequent bathroom use or incontinence episodes.[19]

Early treatment of diarrhea includes promoting hydration with water or fluids that improve electrolyte status (i.e., sports drinks). Intravenous fluids may be required based on the client's disease stage and goals for care. Medications such as loperamide, psyllium, and anticholinergic agents may also be prescribed to decrease the incidence of diarrhea.

Read more about managing diarrhea in the "Elimination" chapter.

Nausea and Vomiting

Nausea is common in advanced disease and is a dreaded side effect of many

18. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

19. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

treatments for cancer. Assessment of nausea and vomiting should include the client's history, effectiveness of previous treatment, medication history, frequency and intensity of episodes of nausea and vomiting, and activities that precipitate or alleviate nausea and vomiting.[20]

Nonpharmacological interventions for nausea include eating meals and fluids at room temperature, avoiding strong odors, avoiding high-bulk meals, using relaxation techniques, and listening to music therapy.[21] Aromatherapy using essential oils such as peppermint oil has been shown to significantly decrease the incidence of nausea and vomiting in hospitalized clients and those receiving chemotherapy.[22] Antiemetic medications, such as prochlorperazine and ondansetron, may be prescribed.

Read more information about managing nausea in the "Antiemetics" section of the Gastrointestinal chapter in Open RN *Nursing Pharmacology, 2e*.

Depression

Clients who have a serious life-threatening illness will normally experience sadness, grief, and loss, but there is usually some capacity for pleasure.

20. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

21. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

22. Efe Ertürk, N., & Taşcı, S. (2021). The effects of peppermint oil on nausea, vomiting and retching in cancer patients undergoing chemotherapy: An open label quasi-randomized controlled pilot study. *Complementary Therapies in Medicine, 56,* 102587. https://doi.org/10.1016/j.ctim.2020.102587.

Persistent feelings of helplessness, hopelessness, and suicidal ideation are not considered a normal part of the grief process and should be treated. Undertreated depression can cause a decreased immune response, decreased quality of life, and decreased survival time. Evaluation of depression requires interdisciplinary assessment and referrals to social work and psychiatry may be needed.[23]

Antidepressants like selective serotonin reuptake inhibitors (SSRIs), such as fluoxetine, paroxetine, sertraline, or citalopram, are generally prescribed as first-line treatment of depression. Other medication may be prescribed if these medications are not effective.

Nonpharmacological interventions for depression may include the following:

- Promoting and facilitating as much autonomy and control as possible.
- Encouraging client and family participation in care, thus promoting a sense of control and reducing feelings of helplessness.
- Reminiscing and life review to focus on life accomplishments and to promote closure and resolution of life events. See Figure 17.23[24] for an image of reminiscing with pictures.
- Grief counseling to assist clients and families in dealing with loss.
- Maximizing symptom management.
- Referring to counseling for those experiencing inability to cope.
- Assisting the client to draw on previous sources of strength, such as faith, religious rituals, and spirituality.
- Referring for cognitive behavioral techniques to assist with reframing negative thoughts into positive thoughts.
- Teaching relaxation techniques.
- Providing ongoing emotional support and "being present."

23. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

24. "photos-256887_960_720.jpg" by jarmoluk is licensed under CC0

- Reducing isolation.
- Facilitating spiritual support.[25]

Figure 17.23 Reminiscing with Pictures

A suicide assessment is critical for a client with depression. It is important for nurses to ask questions, such as these:

- Do you have interest or pleasure in doing things?
- Have you had thoughts of harming yourself?
- If yes, do you have a plan for doing so?

To destigmatize the questions, it is helpful to phrase them in the following way, "It wouldn't be unusual for someone in your circumstances to have thoughts of harming themselves. Have you had thoughts like that?" Clients with immediate, precise suicide plans and resources to carry out this plan should be immediately evaluated by psychiatric professionals.[26]

25. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

26. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

Anxiety

Anxiety is a subjective feeling of apprehension, tension, insecurity, and uneasiness, usually without a known specific cause. It may be anticipatory. It is assessed along a continuum as mild, moderate, or severe. Clients with life-limiting illness will experience various degrees of anxiety due to various issues such as their prognosis, mortality, financial concerns, uncontrolled pain and other symptoms, and feelings of loss of control.[27]

Physical symptoms of anxiety include sweating, tachycardia, restlessness, agitation, trembling, chest pain, hyperventilation, tension, and insomnia. Cognitive symptoms include recurrent and persistent thoughts and difficulty concentrating. See Figure 17.24[28] for an illustration of anxiety.

Figure 17.24 Anxiety

Benzodiazepines (i.e., lorazepam) may be prescribed to treat anxiety. However, the nurse should assess for adverse effects such as oversedation, falls, and delirium, especially in the frail elderly.

Nonpharmacological interventions are crucial and include the following[29]:

27. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

28. "ANXIETY.jpg" by Jayberries is licensed under CC BY-SA 3.0

29. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

- Maximizing symptom management to decrease stressors
- Promoting the use of relaxation and guided imagery techniques, such as breathing exercises, progressive muscle relaxation, and the use of audiotapes
- Referring for psychiatric counseling for those unable to cope with the experience of their illness
- Facilitating spiritual support by contacting chaplains and clergy
- Acknowledging client fears and using open-ended questions and active listening with therapeutic communication
- Identifying effective coping strategies the client has used in the past, as well as teaching new coping skills such as relaxation and guided imagery techniques
- Providing concrete information to eliminate fear of the unknown
- Encouraging the use of a stress diary that helps the client understand the relationship between situations, thoughts, and feelings

Cognitive Changes

Delirium is a common cognitive disorder in hospitals and palliative care settings. Delirium is an acute change in cognition and requires urgent management in inpatient care. Up to 90% of clients at the end of life will develop delirium in their final days and hours of life. Early detection of delirium can cause resolution if the cause is reversible.[30]

Symptoms of delirium include agitation, confusion, hallucinations, or inappropriate behavior. It is important to obtain information from the caregiver to establish a mental status baseline. The most common cause of

30. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

delirium at end of life is medication, followed by metabolic insufficiency due to organ failure.[31]

Medications such as neuroleptics (i.e., haloperidol and chlorpromazine) or benzodiazepines may be prescribed to manage delirium symptoms, but it is important to remember that delirium can be caused by opioid toxicity. It may be helpful to request the presence of family to reorient the patient, as well as provide nonpharmacological interventions such as massage, distraction, and relaxation techniques.[32]

Read more about delirium in the "Cognitive Impairments" chapter.

Fatigue

Fatigue has been cited as the most disabling condition for clients receiving a variety of treatments in palliative care. Fatigue is defined as a distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion that is not proportional to activity and interferes with usual functioning[33] See Figure 17.25[34] for an image of an older client depicting fatigue.

31. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

32. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

33. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

34. "fatigue_sleep_head_old_honey-454317.jpg" by danielam is licensed under CC0

Figure 17.25 Fatigue

The primary cause of fatigue is metabolic alteration related to chronic disease, but it can also be caused by anemia, infection, poor sleep quality, chronic pain, and medication side effects. Nonpharmacological interventions include energy conservation techniques.

Pressure Injuries

Clients at end of life are at risk for quickly developing pressure injuries for a variety of reasons, including decreased nutrition and altered mobility. Prevention is key and requires interventions such as promoting mobility, frequent repositioning, reducing moisture, and encouraging nutrition as appropriate.

The Kennedy Terminal Ulcer is a type of pressure injury that some clients develop shortly before death resulting from multiorgan failure. It usually starts on the sacrum and is shaped like a pear, butterfly, or horseshoe. It is red, yellow, black, or purple in color with irregular borders and progresses quickly.

For example, the injury may be identified by a nurse at the end of a shift who says, “That injury was not present when I assessed the client this morning.”[35]

Read more about assessing, preventing, and treating pressure injuries in the “Integumentary” chapter.

Seizures

Seizures are sudden, abnormal, excessive electrical impulses in the brain that alter neurological functions such as motor, autonomic, behavioral, and cognitive function. A seizure can be caused by infection, trauma, brain injury, brain tumors, side effects of medications, metabolic imbalances, drug toxicities, and withdrawal from medications.[36]

Seizures can have gradual or acute onset and include symptoms such as mental status changes, motor movement changes, and sensory changes. Treatment is focused on prevention and limiting trauma that may occur during the seizure. Medications such as phenytoin, phenobarbital, benzodiazepines, or levetiracetam may be prescribed to prevent or manage seizure activity.[37]

Sleep Disturbances

Sleep disturbances affect quality of life and can cause much suffering. It can be caused by poor pain and symptom management, as well as environmental disturbances. Nurses can promote improved sleep for inpatients by creating a

35. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

36. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

37. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

quiet, calm environment, promoting sleep routines, and advocating for periods of uninterrupted rest without disruptions by the health care team.

Read more about promoting good sleep in the "Sleep and Rest" chapter.

17.5 Nursing Care During the Final Hours of Life

OPEN RESOURCES FOR NURSING (OPEN RN)

Recognizing approaching death allows the client, family members, and interdisciplinary team to prepare for the actively dying phase. The nurse has two primary responsibilities at this time: providing symptom management and preparing the family for what to expect as death is approaching. Nurses also have additional responsibilities regarding organ donation, postmortem care, and facilitating arrangements. Each of these topics will be further discussed in the following subsections.

It is essential for nurses to ensure that clients and their family members have access to the interdisciplinary team in the final days before death. Developmentally appropriate education should be provided to the client, family, and/or other caregivers about what to expect during the final hours of life, as well as immediately following the client's death. Early access to hospice support should be facilitated whenever possible to optimize care outcomes for the client and the family.[1]

Nurses have a responsibility to carry out and respect the client's wishes to the extent they can. Each individual client is different, and what works best for one client might not work well for another. Dying is a multifaceted process that is unique to every person. Providing a "good death" for clients means respecting their preferences and offering support for them and their family.

The nurse assumes multiple roles of advocate, professional caregiver, educator, and supporter and is frequently the one to facilitate a dignified death no matter the setting where death occurs. Nurses must be comfortable

1. American Association of Colleges of Nursing. (2021). *End-of-life-care (ELNEC)*. https://www.aacnnursing.org/ELNEC

in “providing presence” and “bearing witness” with dying clients and their families. Rhythms of care (i.e., vital signs and routine assessments) often change during these final hours; be aware if these actions provide comfort or are burdens causing discomfort.[2]

Avoid overwhelming the family with too much medical jargon. Provide simple answers in accordance with the client’s and family’s understanding and readiness for responses. Family members may be tired, emotional, and have difficulty concentrating. Because they may be in crisis and unable to retain much information, you may need to answer the same questions or provide the same information repeatedly.[3] It is helpful to provide family members written resources about what to expect. A commonly used resource in hospice care that can be very comforting for family members is *Gone From My Sight: The Dying Experience*. It is an inexpensive resource available to order online if it is not available at your facility.

There is no typical death. Each person dies in their own way, at their own time, with their own beliefs and values, and with unique relationships with family, friends, and significant others. Many people experience similar psychological and emotional responses during this time, such as fear of the dying process, fear of abandonment, fear of the unknown, nearing death awareness, and withdrawal. The nurse plays a pivotal role in addressing client’s fears and managing their symptoms according to their preferences.

Managing Common Symptoms During the Dying Process

Most clients experience the dying process as a natural slowing down of physical and mental processes. Two roads to death have often been described. One road involves sedation and lethargy leading to a comatose

2. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

3. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

state and death. Another road involves confusion, restlessness, muscle jerks, seizures, and death.[4] It is important to understand that clients can fluctuate between having a decreased level of consciousness to periods of lucidity, restlessness, agitation, and hallucinations during the dying process. For this reason, individualized care during the dying process is of utmost importance.[5]

Pain and Dyspnea

During the final hours of life, changes in level of consciousness can make assessment and management of pain challenging. Consider behavioral cues such as grimacing and posturing, as well as previous pain issues. Some clients also demonstrate signs of increased dyspnea, commonly referred to as "air hunger," with labored and increased work of breathing.

Pain pumps may be used to relieve severe pain, especially cancer-related pain. Medication can also be administered orally or sublingually, even up to the last hours of life, for pain and dyspnea.[6] For example, Roxanol is a highly concentrated solution of morphine sulfate that can be administered sublingually for pain and/or air hunger. The typical dosage is 20 mg/mL. Morphine not only relieves pain, but also is used to relax respiratory muscles and improve air exchange to relieve air hunger. However, the nurse should always balance providing analgesia with the client's goal for maintaining alertness.

4. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

5. Ijaopo, E. O., Zaw, K. M., Ijaopo, R. O., & Khawand-Azoulai, M. (2023). A review of clinical signs and symptoms of imminent end-of-life in individuals with advanced illness. *Gerontology and Geriatric Medicine*, 26, 9, 23337214231183243. https://doi.org/10.1177/23337214231183243.

6. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

PRINCIPLE OF DOUBLE EFFECT

Nurses and family members may be hesitant to administer morphine in the last few hours of life, fearing that it may hasten death, yet also not wanting to see the client suffer. The American Nurses Association and the Palliative Care Nurses Association support the nurse in this dilemma that is often referred to as the **Rule of Double Effect**. If the intent is good (i.e., relief of pain and suffering), then the act is morally justifiable even if it causes an unintended result of hastening death. Thus, the nurse should provide pain relief, without fear of sedation or respiratory depression that typically limits the administration of opioids, in the final days and hours of a client's life.[7]

Terminal Secretions

Terminal secretions, commonly known as the "death rattle," can be a distressing and frightening symptom for family members and those involved in the client's care. Terminal secretions are usually observed 3-23 hours before death. Terminal secretions occur as the larynx relaxes and are a result of air moving over secretions in the mouth that have drained from the upper airways. These secretions are often located in the hypopharynx and trachea rather than the mouth, which makes them difficult to suction.[8]

Anticholinergic medications, such as atropine or scopolamine, can be used to dry the secretions. It is also helpful to reposition the client on their side, if feasible. Suctioning is not recommended because it is not typically effective for these types of secretions and can cause increased agitation and distress in the client. Family members caring for clients at home under hospice care

7. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

8. HPNA Primary Palliative Nursing. (n.d.). *Terminal secretions*. https://www.sicp.it/wp-content/uploads/2020/05/HPNA_Terminal-Secretions.pdf

should be warned about this phenomenon and instructed about potential treatment.[9]

View supplementary YouTube videos[10] [11] [12] [13] about palliative care:

Lessons from a hospice nurse: Alia Indrawan at TEDxUbud

Terminal Secretions, the Death Rattle Explained by Hospice Nurse

What does the death rattle sound like? | Signs of approaching death

This is what actively dying looks like hospice care

9. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

10. TedX Talks. (2012, June 22). *Lessons from a hospice nurse: Alia Indrawan at TEDxUbud*[Video]. YouTube. All rights reserved.https://youtu.be/2xs8qmk0OPc

11. Hospice Nurse Julie. (2023, April 19). *Terminal Secretions, the Death Rattle Explained by Hospice Nurse*. [Video]. YouTube. All rights reserved. https://www.youtube.com/watch?v=fWQ7zinMtDY

12. Dr. Paulien Moyaert. (2022, September 13). *What does the death rattle sound like? | Signs of approaching death*. [Video]. YouTube. All rights reserved. https://www.youtube.com/watch?v=gCdIXgcOnr0

13. Hospice Nurse Julie. (2023, November 5).*This is what actively dying looks like hospice care*. [Video]. YouTube. All rights reserved.

Phases of Dying

There are typically four phases that a person progresses through when dying. These phases include actively dying, transitioning, imminent death, and death.

Actively Dying

A client in this phase will experience symptoms such as pain, dyspnea, fatigue, cough, incontinence, nausea and vomiting, depression, anxiety, and seizures. Treatments during this phase are focused on symptom management and emotional support to both the client and the family. Read more about symptom management in the "Palliative Care Management" section of this chapter.

Educating the family and client on what to expect is essential. Include written materials and progressive education as the client's condition changes. It is often helpful to provide guidance to the family in anticipation of upcoming phases of dying.

Transitioning

This is the phase between actively dying and imminent death where the client withdraws physically. The client begins to demonstrate decreased interest in activities of life with less frequent interactions with others and often has hallucinations. Other signs of this phase include hypoxia and acidosis. It is important for the nurse to keep the client's environment as comfortable as possible, such as keeping lights low and minimizing alarms and other noises.

Imminent

Death will occur at any point during the imminent phase due to multisystem organ failure. This phase usually occurs within 24 hours before death with

common, recognizable signs. See Table 17.5 for typical signs that occur during this stage and indicate that death is imminent.

Table 17.5 Typical Signs as Death Becomes Imminent

System	Signs
Cardiovascular	Cool, clammy skin; mottled extremities; rapid or irregular pulse
Musculoskeletal	Inability to ambulate, move, or turn in bed
Neurological	Confusion, restlessness, increased lethargy, hallucinations
Respiratory	Increased respiratory rate, inability to clear secretions, Cheyenne-Stokes respirations, noisy breathing (i.e., terminal secretions)
Urinary	Decreased or dark urine output

During this stage, the family often requires additional support from the nurse as death becomes more of a reality. Vital signs, lab draws, and other invasive procedures are usually no longer performed because they do not provide a benefit for the client and often cause client distress or discomfort. The nurse should offer support by encouraging reminiscence, calming music, touch, light massage, presence, and prayer (according to family preferences) as the client begins their transition.

The dying process is variable for each individual. Families often ask for a definitive time frame when death will occur. Although the signs previously discussed indicate progression to death within 24 hours, a specific time line cannot be predicted. Some clients seem to instinctively know when death will occur.

Be aware of religious practices and beliefs that are sacred to the client and/or their family members at this time. Provide spiritual comfort through presence and prayer (based on client preferences and the nurse's comfort level). Call the agency chaplain and/or the client's clergy as indicted. (Read more about chaplains in the "Spirituality" chapter.) Encourage family members to bring in favorite hymns, scriptures, or symbols (such as a rosary, if

applicable) so the client can experience these spiritual comforts through different senses (hearing, seeing, touching).[14]

Consider coaching family members about the five tasks that may serve as parting words with their loved one:

- To ask forgiveness
- To forgive
- To say "Thank you"
- To say "I love you"
- To say "Goodbye"

> Read more about parting tasks in the book by Ira Byock, M.D. titled *The Four Things That Matter Most.*[15]

DEATH VIGIL BY FAMILY MEMBERS

Family members have historically desired to be at the client's bedside during the days to hours before death. See Figure 17.26[16] for artwork depicting the death vigil by family members when George Washington died.

14. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

15. Byock, I. (2023). Books Overview: The Four Things That Matter Most. https://irabyock.org/books/the-four-things-that-matter-most/

16. "Life_of_George_Washington_LCCN2002719381.jpg" by Popular Graphic Arts is in the Public Domain

Figure 17.26 Death Vigil

Family members have common fears, such as the following:

- The client being alone when they die
- Not knowing how to react or what to do
- Watching the client suffer
- Not knowing if the client has died
- Giving the “last dose” of medication at home and inadvertently causing death

It is important for the nurse to address family members’ fears proactively and provide education and support.

Death and Postmortem Care

Clinical death refers to cessation of heartbeat or brain death. Within four to six minutes of clinical death, CPR can be performed to attempt resuscitation. However, because most clients receiving palliative care at the end of life have Do Not Resuscitate (DNR) orders in place, CPR is not performed. After this time window, brain cells die from lack of oxygen, followed by death of cells in other organs. This is called biological death. The nurse should listen to the apical heartbeat for one full minute to ensure and document that death has

occurred. Rigor mortis, stiffening of muscles, will begin to set in several hours following death and be at its peak 12-18 hours following death. Rigor mortis disappears 48 hours following death.

When a client passes away, the nurse should perform and document a final nursing assessment that includes the following:

- Date and time of the assessment
- Client name
- Time and name of physician contact. Some agency policies require a physician order to remove the body to the morgue, as well as a date and time of death
- Individuals present at time of death (i.e., family members, friends)
- Lack of response to stimuli
- Absence of apical pulse
- Arrangement for transport to the morgue or funeral home

Care following a client's death requires sensitivity for the dignity of the deceased, as well as time for the care of family members. Following the death pronouncement, family members may feel numb and confused about what to do next. In a quiet and private place, explain the process for care of the body immediately following death.[17]

Following death, medical supplies and equipment tubes should be removed unless a coroner must approve of such measures. Coroner notification is based on county and state law and depends on several factors, such as the cause of death or suspicious circumstance surrounding the death. The goal is to provide a more personal closure experience for the family, leaving them memories of the deceased as a loved one rather than as a client. Bathing, dressing, and positioning the body show respect and provide dignity for the client and family. Position the body in proper alignment and place dentures in the mouth. Place dressings on leaking wounds and apply

17. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

incontinence products as needed. Remember to honor cultural practices regarding care of the body after death and who should provide that care.[18]

The nurse should continue to provide support for the family and offer assistance as needed, such as contacting other family members to inform them of the death. Some family members may want to take pictures, comb their loved one's hair, wash their face, hold their hand, kiss them, or crawl into bed and hold them. Support families in their various ways of saying goodbye.

Ask if the family completed preplanning for burial or cremation, but do not rush their final visit. In some cases, families will not have had time for making prearrangements. If they have made prearrangements, contact the funeral home. Be aware of county and agency policies that may require notification of the local coroner prior to calling the funeral home.[19] When burial is chosen, the body will be embalmed, which is removing blood from the body and replacing it with an embalming solution that contains formaldehyde and other chemicals. The embalming process temporarily preserves the body to be shown at a funeral or memorial service. Cremation is the process of using heat to reduce the body to ashes that can be placed in a container called an urn. In some cultures, cremation is an ancient tradition. Depending on the family's cultural beliefs and preferences, the ashes may be buried, placed in a mausoleum, or kept at home in an urn. See Figure 17.27[20] for an image of a burial in a memorial garden.

18. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

19. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

20. "Memorial_Garden,_the_Museum_of_the_US_Air_Forces,_Dayton,_Ohio._(41410862864).jpg" by Roland Turner is licensed under CC BY-SA 2.0

Figure 17.27 Burial in a Memorial Garden

In hospital settings, there may be a sense of urgency to get the room cleared as soon as possible so that another client can be admitted. However, the nurse should advocate for the client and make arrangements so the family does not feel rushed.[21] After the family has said their goodbyes and left the room, it is the nurses responsibility to ensure identification tags are applied to the body and the client is moved to the morgue.

Organ Donation

If the client is an organ or tissue donor, follow procedures as planned and in accordance with state and care setting guidelines, policies, and procedures. The driver's license of the client may have information about their organ donation wishes. Federal law and Medicare regulations mandate that hospitals give surviving family members the chance to authorize donation of their loved one's organs and tissues. Many family members feel consolation in helping others through organ donation despite their own loss. There is no cost for organ or tissue donation.

21. Lowey, S. E. (2015). *Nursing care at the end of life*. Open Library. https://ecampusontario.pressbooks.pub/nursingcare/

17.6 Applying the Nursing Process at End of Life

OPEN RESOURCES FOR NURSING (OPEN RN)

This section will summarize the steps of the nursing process when caring for a client who is actively dying as well as their family members.

Assessment

Assessments are generally limited for clients at the end of life with the overall treatment goal being comfort. The goal in any performed assessment is to help ease the client's discomfort as the body begins to fail and facilitate a peaceful transition. If end-of-life care is occurring within the hospital setting, the nurse may need to remind members of the care team that "normal" care routines are not required. This may include collection of vital signs, intake and outputs, laboratory blood draws, and full physical assessment. It can feel challenging to switch modes of care in the inpatient setting where so many of our actions are focused on intervention and restoring a client to health. However, it is important to remember that our interventions take a different, but no less important, form. Providing comfort care at the end of life is one of the most important interventions a nurse can do to help ease client and family suffering.

Subjective Assessment

Many individuals at the end of life may be nonverbal. Some may experience times of reminiscence as they progress toward death. It is important for the nurse to inform the family that communication can be quite variable as the client progresses toward death, but the sense of hearing may still be intact. Family members and friends should be encouraged to share their thoughts

and feelings with the client, taking time to relate stories of comfort and feelings to the client. This can be a therapeutic exchange for both the client and the family.

Objective Assessment

Physical assessments should be limited and focused on providing client comfort and creating a supportive environment for a therapeutic transition. Signs of pain such as grimacing, moaning, furrowing brow, and physical guarding should be noted and addressed. Many clients may experience increased respirations, labored breathing, and increased secretions that produce an audible respiratory "rattle." The client typically has a significant decline in circulation as they progress towards death, evidenced by cool and clammy skin, mottled extremities, and diminished pulses. The nurse should continue to monitor for signs of skin breakdown and urinary retention.

Notify the provider of unexpected findings on assessment, such as severe pain not relieved by pain management protocol, acute labored breathing, terminal secretions, or urinary retention resulting in bladder distention.

Diagnosis

As the client progresses toward death, diagnosis statements are focused on provision of comfort for the client. Identification of acute pain and ineffective breathing are areas that typically become priority as clients near their final transition. Additionally, attention to family coping and caregiver role strain remain areas of focus as the nurse assists family members in coping with the dying process.

When planning care, review a nursing care planning source for current NANDA-I approved nursing diagnoses and evidence-based nursing interventions. See Table 17.6 for the definition and defining characteristics regarding the NANDA-I diagnosis *Death Anxiety*.

Table 17.6 NANDA-I Nursing Diagnoses Death Anxiety[1]

NANDA-I Diagnosis	Definition	Selected Defining Characteristics
Death Anxiety	Emotional distress and insecurity, generated by anticipation of death and the process of dying of oneself or significant others, which negatively effects one's quality of life.	• Expresses deep sadness • Expresses concern about caregiver strain • Expresses fear of pain or suffering related to dying • Expresses fear of prolonged dying process • Expresses fear of suffering related to dying • Expresses fear of the unknown • Reports negative thoughts related to death and dying

Outcomes

An overall goal for a client who is actively dying is, "*The client will experience dignified life closure as evidenced by*:

- *Expression of readiness for death*
- *Resolution of important issues*
- *Sharing of feelings about dying*

1. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

- *Discussion regarding spiritual concerns*"[2]

An example of a SMART outcome for a client actively dying is, "*The client will express their fears associated with dying by the end of the shift*."[3]

Nursing goals focus on the provision of comfort. For example, a common nursing goal is, "*The client will experience adequate pain management based on their expressed goals for pain relief and alertness*."

Planning and Implementing Interventions

Many clients require pain medications to assist with a therapeutic transition as they near death. These medications often include morphine and lorazepam to help ease pain, dyspnea, and anxiety. It is important for the nurse to be conscientious of the appropriateness of the medication's route of administration, recognizing that client condition can change rapidly. Concentrated oral solutions are absorbed through the buccal membranes, but if pain management needs are high, it may be necessary to contact the provider regarding a subcutaneous pump. Many clients in the imminent phase have terminal secretions so anticholinergic medications such as atropine or scopolamine may be administered. When anticholinergic medications are administered, good oral care is crucial because oral secretions are decreased. Oral swabs and lip moisturizer can be used to promote comfort. See the following box for a summary of other nursing interventions in the last days and hours of a client's life.

2. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 144-147, 434-444.

3. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 144-147, 434-444.

Interventions in the Last Days and Hours of Life[4]

- Honor the client's preferences for end-of-life care.
- Be respectful of the environment. Physical assessment and cares should be provided with the utmost respect and attention to comfort. Shielding the client from harsh light or loud voices is encouraged to help provide a respectful environment.
- Reinforce the steps of the dying process so that family remains cognizant of what to expect. Although this can feel redundant, this conversation and anticipatory planning are very helpful due to the emotional nature of the situation and challenges that they may experience with information retention.
- Be present and attentive. Use active empathetic listening.
- Encourage the family to create a quiet and comfortable environment.
- Assess the client for pain and provide pain relief measures based on their preferences.
- Assess the client for fears related to death.
- Assist the client with life review and reminiscence.
- Provide music of the client's choosing.
- Provide social support for families and guide them through end-of-life issues.
- Recognize the spiritual needs of the client and their family members. Support religious beliefs, rituals, and prayer.

4. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 144-147, 434-444.

- Encourage family members to be physically close to their loved one and give them permission to touch them.
- When death occurs, allow appropriate time for closure. Provide information regarding the next steps of physical care and transporting the client.

Evaluation

It is always important to evaluate the effectiveness of interventions based on the outcome criteria established for each client. The nurse should closely monitor for escalating signs of client discomfort that is not managed by the current treatment plan. It is helpful to educate the family regarding whom to contact if additional concerns arise.

17.7 Putting It All Together

Client Scenario

Mr. Yun is a 34-year-old man presenting to his physician's office for a follow-up visit. The client recently experienced the loss of his wife in a motor vehicle accident and reports, "I have problems concentrating and I can't sleep at night." The client's chart indicates he has lost 15 pounds since his previous visit last month. He reports, "I have a hard time getting out of bed in the morning." On further questioning, he admits drinking five to six alcoholic beverages every night to "numb myself."

Applying the Nursing Process

Assessment: The nurse notes that Mr. Yun is experiencing difficulty concentrating, difficulty sleeping, and unintentional weight loss of greater than 15 pounds since his wife passed away. He self-reports drinking five to six alcoholic beverages every night to "numb myself."

Based on the assessment information that has been gathered, the following nursing care plan is created for Mr. Yun:

Nursing Diagnosis: *Ineffective Coping related to inability to deal with a situation as manifested by unintended weight loss, difficulty concentrating, difficulty sleeping, and drinking five to six alcoholic beverages daily to "numb myself."*

Overall Goal: *The client will demonstrate improved coping.*

SMART Expected Outcome: *Mr. Yun will verbalize three positive coping behaviors by the end of the teaching session.*

Planning and Implementing Nursing Interventions:

The nurse will identify the client's personal resources and relationships. The nurse will use empathetic communication to establish a relationship with the client. The nurse will encourage the client to participate in activities that bring personal satisfaction to the client. The nurse will provide education regarding the value of exercise, meditation, prayer, etc., to enhance individual coping.

The nurse will provide health teaching about support resources available within the client's community.

Sample Documentation:

Mr. Yun exhibits signs of ineffective coping in relation to his inability to deal with the loss of his wife. He reports difficulty concentrating, difficulty sleeping, and drinking five to six alcoholic beverages nightly to "numb myself." He has had unintended weight loss of 15 pounds in the past month. Health teaching was provided regarding positive coping skills. Mr. Yun verbalized three positive coping behaviors he plans to implement this month.

Evaluation:

At the end of the teaching session, the nurse asks Mr. Yun what healthy coping strategies he plans to implement. Mr. Yun states he plans to go for daily walks, limit his alcohol intake to two servings a day, and listen to a meditation app that he enjoys every evening before bed. He plans to contact a local church to attend a support group for widowers. The SMART outcome was "met."

17.8 Learning Activities

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Activities

(Answers to "Learning Activities" can be found in the "Answer Key" at the end of the book. Answers to interactive activity elements will be provided within the element as immediate feedback.)

Scenario A

You are a nurse providing care for Mrs. Lyn, a 47-year-old client admitted with metastatic lung cancer receiving hospice care. The client's condition has declined significantly over the past week; she is actively dying. Over the last 24 hours, Mrs. Lyn has declined rapidly and is now unresponsive but appears to be resting comfortably. You enter the client's room and find Mr. Lyn weeping at the client's bedside.

1. What actions would you take to comfort Mr. Lyn?
2. Mrs. Lyn develops labored breathing. What medication is helpful to administer to treat dyspnea at end of life?
3. Mrs. Lyn's breathing becomes less labored with medication, but her respiratory rate becomes irregular. Mr. Lyn tells the nurse, "My daughter lives six hours away and would like to be here when the time comes. How much longer does she have to live?" What is the nurse's best response?
4. The daughter arrives and seems hesitant to talk to or touch

her mother. What tasks can the nurse coach family members to do at the end of a client's life?

5. Mrs. Lyn dies the following evening. What postmortem care should the nurse provide?

Scenario B

Terry, a 42-year-old male client, was recently diagnosed with advanced colon cancer and underwent a colon resection a few days ago. While changing his colostomy bag, he comments to the nurse, "I still can't believe this is happening to me."

1. According to Kubler-Ross' theory of grief/loss, what stage of grief is Terry currently experiencing?
2. The nurse responds, "This is a difficult time for you." Terry replies, "Yes, it is. My parents want me to do every kind of experimental treatment possible, but I just want to live my life until the time comes." The nurse asks, "You have some tough decisions to make. Has anyone talked to you about palliative care yet?" Terry asks, "I've never heard of palliative care. What is it?" How would you explain palliative care to him?
3. Terry states, "I don't want my parents telling my doctor what to do. It is my decision." The nurse asks, "Do you have any advance directives in place?" Terry responds, "What are advance directives?" How would you explain advance directives to Terry?
4. The nurse identifies "Grieving related to anticipatory loss as evidenced by disbelief and feeling of shock" as a nursing diagnosis for Terry. Identify a SMART outcome.
5. The nurse plans interventions to enhance Terry's coping. List sample nursing interventions that may help Terry to cope with this new diagnosis.

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1625#h5p-73

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1625#h5p-37

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1625#h5p-38

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1625#h5p-87

Test your knowledge using this NCLEX Next Generation-style bowtie question. You may reset and resubmit your answers to this question an unlimited number of times.[1]

1. "Chapter 17 Assignment 1" by Tami Davis for OpenRN is licensed under CC BY-NC 4.0

XVII Glossary

OPEN RESOURCES FOR NURSING (OPEN RN)

Acute grief: Grief that begins immediately after the death of a loved one and includes the separation response and response to stress. (Chapter 17.2)

Advance directives: Legal documents that direct care when the client can no longer speak for themselves, including the living will and the health care power of attorney. (Chapter 17.2)

Anorexia: Loss of appetite or loss of desire to eat. (Chapter 17.4)

Anticipatory grief: Grief before a loss, associated with diagnosis of an acute, chronic, and/or terminal illness experienced by the client, family, and caregivers. Examples of anticipatory grief include actual or fear of potential loss or health, independence, body part, financial stability, choice, or mental function. (Chapter 17.2)

Bereavement period: The time it takes for the mourner to feel the pain of the loss, mourn, grieve, and adjust to the world without the presence of the deceased. (Chapter 17.2)

Burnout: A caregiver's diminished caring and cynicism that can be triggered by workplace demands, lack of resources to do work professionally and safely, interpersonal relationship stressors, or work policies that can lead to diminished caring and cynicism. Burnout may be manifested physically and psychologically with a loss of motivation. (Chapter 17.2)

Cachexia: Wasting of muscle and adipose tissue due to lack of nutrition. (Chapter 17.4)

Cardiopulmonary resuscitation (CPR): Emergency treatment initiated when a client's breathing stops or their heart stops beating. It may involve chest compressions and mouth-to-mouth breathing, electric shocks to stop lethal cardiac rhythms, breathing tubes to open the airway, or cardiac medications. (Chapter 17.2)

Comfort care: Care that occurs when the client's and medical team's goals shift from curative interventions to symptom control, pain relief, and quality of life. (Chapter 17.2)

Compassion fatigue: A state of chronic and continuous self-sacrifice and/or prolonged exposure to difficult situations that affect a health care professional's physical, emotional, and spiritual well-being. (Chapter 17.2)

Complicated grief: Chronic grief, delayed grief, exaggerated grief, and masked grief are types of complicated grief. (Chapter 17.2)

Disenfranchised grief: Any loss that is not validated or recognized. (Chapter 17.2)

Do-not-resuscitate (DNR) order: A medical order that instructs health care professionals not to perform cardiopulmonary resuscitation (CPR) if a client's breathing stops or if the client's heart stops beating. (Chapter 17.2)

Fading away: A transition that families make when they realize their seriously ill family member is dying. (Chapter 17.2)

Grief: The emotional response to a loss, defined as the individualized and personalized feelings and responses that an individual makes to real, perceived, or anticipated loss. (Chapter 17.2)

Health care power of attorney: A legal document that identifies a trusted individual to serve as a decision maker for health issues when the client is no longer able to speak for themselves. (Chapter 17.2)

Hospice care: A type of palliative care that addresses care for clients who are terminally ill when a health care provider has determined they are expected to live six months or less. (Chapter 17.2)

Living will: A legal document that describes the client's wishes if they are no longer able to speak for themselves due to injury, illness, or a persistent vegetative state. The living will addresses issues like ventilator support, feeding tube placement, cardiopulmonary resuscitation, and intubation. (Chapter 17.2)

Loss: The absence of a possession or future possession with the response of grief and the expression of mourning. (Chapter 17.2)

Mourning: The outward, social expression of loss. Individuals outwardly express loss based on their cultural norms, customs, and practices, including rituals and traditions. (Chapter 17.2)

Normal grief: The common feelings, behaviors, and reactions to loss. (Chapter 17.2)

Palliative care: A broad philosophy of care defined by the World Health

Organization as improving the quality of life of clients, as well as their family members, who are facing problems associated with life-threatening illness. It prevents and relieves suffering through early identification, correct assessment, and treatment of pain and other problems, whether physical, psychosocial, or spiritual.[1] (Chapter 17.2)

Rule of Double Effect: If the intent is good (i.e., relief of pain and suffering), then the act is morally justifiable even if it causes an unintended result of hastening death. (Chapter 17.5)

1. World Health Organization. (2020). *Palliative care*. https://www.who.int/news-room/fact-sheets/detail/palliative-care

PART XVIII

SPIRITUALITY

18.1 Spirituality Introduction

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Objectives

- Adapt care considering all aspects of diversity
- Identify principles of protecting client dignity
- Identify principles of holistic, client-centered care by incorporating cultural, religious, and spiritual influences on client health
- Identify strategies to advocate for clients
- Identify principles of religion and spirituality as they relate to health

Spirituality includes a sense of connection to something bigger than oneself and typically involves a search for meaning and purpose in life. People may describe a spiritual experience as sacred or transcendent or simply feel a deep sense of aliveness and interconnectedness. Some people's spiritual life is linked to a religious association with a church, temple, mosque, or synagogue, whereas others pray and find comfort in a personal relationship with God or a higher power and still others find meaning through their connections to nature or art. A person's definition of spirituality and sense of purpose often

change throughout one's lifetime as it evolves based on personal experiences and relationships.[1]

Over the past decade, research has demonstrated the importance of spirituality in health care. Spiritual distress is very common in clients and their family members experiencing serious illness, injury, or death, and nurses are on the front lines as they assist these individuals to cope. Addressing a client's spirituality and providing spiritual care have been shown to improve clients' health and quality of life, including how they experience pain, cope with stress and suffering associated with serious illness, and approach end of life.[2,3]

Consensus-driven recommendations define a spiritual care model where all clinicians address spiritual issues and work with trained chaplains who are spiritual care specialists.[4,5] By therapeutically using presence, unconditional

1. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

2. Pilger, C., Molzahn, A. E., de Oliveira, M. P., & Kusumota, L. (2016). The relationship of the spiritual and religious dimensions with quality of life and health of patients with chronic kidney disease: An integrative literature review. *Nephrology Nursing Journal, 43*(5), 411–426. https://pubmed.ncbi.nlm.nih.gov/30550069/

3. Puchalski, C., Jafari, N., Buller, H., Haythorn, T., Jacobs, C., & Ferrell, B. (2020). Interprofessional spiritual care education curriculum: A milestone toward the provision of spiritual care. *Journal of Palliative Medicine, 23*(6), 777–784. https://doi.org/10.1089/jpm.2019.0375

4. Pilger, C., Molzahn, A. E., de Oliveira, M. P., & Kusumota, L. (2016). The relationship of the spiritual and religious dimensions with quality of life and health of patients with chronic kidney disease: An integrative literature review. *Nephrology Nursing Journal, 43*(5), 411–426. https://pubmed.ncbi.nlm.nih.gov/30550069/

5. Puchalski, C., Jafari, N., Buller, H., Haythorn, T., Jacobs, C., & Ferrell, B. (2020).

acceptance, and compassion, nurses often provide spiritual care and help clients find hope and meaning in their life experiences.[6] The Interprofessional Spiritual Care Education Curriculum (ISPEC), developed by George Washington University for health care professionals, is an education initiative to improve spiritual care for seriously ill clients in the United States and internationally. This chapter will introduce concepts included in the ISPEC curriculum, review religious beliefs and practices of various world religions, and discuss therapeutic interventions that nurses can use to promote clients' and their own spiritual well-being.

- Read more about professional development opportunities regarding spiritual health using the Interprofessional Spiritual Care Education Curriculum (ISPEC) offered by George Washington University Institute for Spirituality and Health.
- Explore more information about spirituality using free online resources provided by the University of Minnesota's Earl E. Bakken Center for Spirituality and Healing.

Interprofessional spiritual care education curriculum: A milestone toward the provision of spiritual care. *Journal of Palliative Medicine, 23*(6), 777–784. https://doi.org/10.1089/jpm.2019.0375

6. Erickson, H. (2007). Philosophy and theory of holism. *The Nursing Clinics of North American, 42*(2). https://doi.org/10.1016/j.cnur.2007.03.001

18.2 Basic Concepts

OPEN RESOURCES FOR NURSING (OPEN RN)

Spiritual Distress

When clients are initially diagnosed with an illness or experience a serious injury, they often grapple with the existential question, "Why is this happening to me?" This question is often a sign of spiritual distress. **Spiritual distress** is defined by NANDA-I as, "A state of suffering related to the impaired ability to integrate meaning and a purpose in life through connections with self, others, the world, and/or a power greater than oneself."[1] Nurses can help relieve this suffering by therapeutically responding to a client's signs of spiritual distress and advocating for their spiritual needs throughout their health care experience.

Spirituality

Provision 1 of the ANA Code of Ethics states, "The nurse practices with compassion and respect for the inherent dignity, worth, and unique attributes of every person" and "optimal nursing care enables the client to live with as much physical, emotional, social, and religious or spiritual well-being as possible and reflects the client's own values."[2]

Spirituality is defined by the Interprofessional Spiritual Care Education

1. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

2. American Nurses Association. (2015). *Code of ethics for nurses with interpretive statements*. American Nurses Association. https://www.nursingworld.org/practice-policy/nursing-excellence/ethics/code-of-ethics-for-nurses/coe-view-only/

Curriculum (ISPEC) as, "A dynamic and intrinsic aspect of humanity through which persons seek ultimate meaning, purpose, and transcendence and experience relationship to self, family, others, community, society, nature, and the significant or sacred."[3] Spiritual needs and spirituality are often mistakenly equated with religion, but spirituality is a broader concept. Elements of spirituality include faith, meaning, love, belonging, forgiveness, and connectedness.[4] Spirituality and spiritual values in the context of nursing are closely intertwined with the concept of caring.[5] See Figure 18.1[6] for an illustration of the concept of spirituality.

3. Puchalski, C. M., Vitillo, R., Hull, S. K., & Reller, N. (2014). Improving the spiritual dimension of whole person care: Reaching national and international consensus. *Journal of Palliative Medicine, 17*(6), 642–656. https://doi.org/10.1089/jpm.2014.9427

4. Rudolfsson, G., Berggren, I., & da Silva, A. B. (2014). Experiences of spirituality and spiritual values in the context of nursing – An integrative review. *The Open Nursing Journal, 8*, 64–70. https://doi.org/10.2174%2F1874434601408010064

5. Rudolfsson, G., Berggren, I., & da Silva, A. B. (2014). Experiences of spirituality and spiritual values in the context of nursing – An integrative review. *The Open Nursing Journal, 8*, 64–70. https://doi.org/10.2174/1874434601408010064

6. "960_720.jpg" by Activedia is licensed under CC0

Figure 18.1 Spirituality

An integrative review of nursing research and resources was completed in 2014 to describe the impact of spirituality and spiritual support in nursing.[7] See the following box for discussion of findings from this integrative review.

Integrative Review of Spirituality in Nursing[8]

An integrative review of nursing literature selected 26 articles published between 1999 and 2013 to describe the experiences of spirituality and the positive impact of spiritual support in nursing

7. Rudolfsson, G., Berggren, I., & da Silva, A. B. (2014). Experiences of spirituality and spiritual values in the context of nursing – An integrative review. *The Open Nursing Journal, 8*, 64–70. https://doi.org/10.2174%2F1874434601408010064

8. Rudolfsson, G., Berggren, I., & da Silva, A. B. (2014). Experiences of spirituality and spiritual values in the context of nursing – An integrative review. *The Open Nursing Journal, 8*, 64–70. https://doi.org/10.2174%2F1874434601408010064

literature.[9] Spirituality was described as the integration of body, mind, and spirit into a harmonious whole (often referred to as holistic care). Spirituality was associated with the development of inner strength, looking into one's own soul, believing there is more to life than worldly affairs, and trying to understand who we are and why we are on this earth.

Transcendence was described as an understanding of being part of a greater picture or of something greater than oneself, such as the awe one can experience when walking in nature. It was also expressed as a search for the sacred through subjective feelings, thoughts, and behaviors. Spirituality was found to have a positive effect on clients' health and promoted recovery by viewing life from different perspectives and looking beyond one's own anxiety to develop an understanding of illness and change.

Relationships and connectedness were also found to be powerful spiritual interventions that contributed to an individual's spirituality. This included embracing, crying together, gift giving, having coffee together, and visiting each other. Laughter, happy thoughts, and the smiles of others were considered comforting. Being with others was described as a primary spiritual need, and conversation was unnecessary. Spirituality brought about the realization that the relationship with family and friends is important and involves finding a healthy balance in relationships among friends, family, society,

9. Rudolfsson, G., Berggren, I., & da Silva, A. B. (2014). Experiences of spirituality and spiritual values in the context of nursing – An integrative review. *The Open Nursing Journal, 8*, 64–70. https://doi.org/10.2174/1874434601408010064

and a higher power. Presence was the most influential element in positively influencing recovery. The presence of family and friends was a calming experience that brought forth comfort, peace, happiness, joy, acceptance, and hope.

Nurses facilitate their clients' search for meaning by enabling them to express personal beliefs, as well as by supporting them in taking part in their religious and cultural practices. Furthermore, nurses assess and meet their clients' spiritual needs by using active listening when talking, asking questions, and picking up client cues. Active listening requires nurses to be fully present, especially when clients appear depressed or upset.

Nurses were found to use their own spirituality when helping clients achieve spiritual well-being. A desire to help others in need is an important part of spirituality, which is also described as discovering meaning and purpose in life and offering the gift of self to others. Helping others also brings a sense of self-worth, personal fulfilment, and satisfaction.

Spiritual Assessment

The Joint Commission requires that health care organizations provide a spiritual assessment when clients are admitted to a hospital. Spiritual assessment can include questions such as the following:

- Who or what provides you with strength or hope?
- How do you express your spirituality?
- What spiritual needs can we advocate for you during this health care experience?

In addition to performing a routine spiritual assessment on admission, nurses often notice other cues related to a client's spiritual distress or desire to enhance their spiritual well-being. When these cues are identified, spiritual

care should be provided to relieve suffering and promote spiritual health. There are several nursing interventions that can be implemented, in addition to contacting the health care agency's chaplain or the client's clergy member. See the "Applying the Nursing Process" section of this chapter for a discussion of spiritual assessment tools and nursing interventions related to spiritual care.

Many hospitals, nursing homes, assisted living facilities, and hospices employ professionally trained **chaplains** to assist with the spiritual, religious, and emotional needs of clients, family members, and staff. In these settings, chaplains support and encourage people of all religious faiths and cultures and customize their approach to each individual's background, age, and medical condition. Chaplains can meet with any individual regardless of their belief, or lack of belief, in a higher power and can be very helpful in reducing anxiety and distress. A nurse can make a referral for a chaplain without a provider order. See Figure 18.2[10] for an image of a hospital chaplain offering support to a client.

Figure 18.2 Hospital Chaplain

A chaplain assists clients and their family members to develop a spiritual view of their serious illness, injury, or death, which promotes coping and healing. A spiritual view of life and death includes elements such as the following:

10. "Pastoral_Care.jpg" by WikiDavidUser is licensed under CC BY-SA 3.0

- **Suffering** occurs at physical, mental, emotional, and spiritual levels. Sociocultural factors, religious beliefs, family values and dynamics, and other environmental factors affect a person's response to suffering.
- **Hope** is a desire or goal for a particular event or outcome. For example, some people may view dying as "hopeless" whereas a spiritual view can define hope as a "good death" when the client dies peacefully according to the end-of-life preferences they previously expressed. Read more about the concept of a "good death" in the "Grief and Loss" chapter.
- **Mystery** is knowing there is truth beyond understanding and explanation.
- **Peacemaking** is the creation of a space for nurturing and healing.
- **Forgiveness** is an internal process releasing intense emotions attached to past incidents. Self-forgiveness is essential to spiritual growth and healing.
- **Prayer** is an expression of one's spirituality through a personalized interaction or organized form of petitioning and worship.

View these videos about spiritual care provided by chaplains[11,12,13,14]:

- Spiritual Health and Chaplains
- A Day in the Life of a Chaplain
- Spiritual Health
- Chaplains and the Role of Spiritual Care in Health Care

11. Religion & Ethics NewsWeekly. (2016, September 16). *Spiritual healthcare* [Video]. YouTube. All rights reserved. https://youtu.be/97d1JMKTuk4

12. Northwell Health. (2015, December 14). *A Day in the life of a chaplain* [Video]. YouTube. All rights reserved. https://youtu.be/0mERMJikQkg

13. Harvard T. H. Chan School of Public Health. (2017, August 29). *Focus on the spiritual health can benefit patients–and doctors* [Video]. YouTube. https://youtu.be/mDfkhILODtE

14. Intermountain Healthcare. (2017, February 21). *Chaplains and the role of spiritual care in healthcare* [Video]. YouTube. All rights reserved. https://youtu.be/l6n6chrQX0A

18.3 Common Religions and Spiritual Practices

OPEN RESOURCES FOR NURSING (OPEN RN)

It can be helpful for nurses to have basic knowledge about common religions and religious practices as they support their clients' spiritual beliefs. This section will provide an overview of basic elements of common religions and religious practices. Keep in mind that a full spiritual assessment is necessary to determine an individual's beliefs that may or may not follow specific practices outlined for a religion.

Religious Classifications

For centuries, humankind has sought to understand and explain the "meaning of life." Many philosophers believe this contemplation and the desire to understand our place in the universe are what differentiate humankind from other species. Religion, in one form or another, has been found in all human societies since human societies first appeared.[1]

Religion is a unified system of beliefs, values, and practices that a person holds sacred or considers to be spiritually significant. Spiritual practices often unite a moral community called a church. Some people associate religion with a place of worship (e.g., a synagogue or church), a practice (e.g., attending religious services, being baptized, or receiving communion), or a

1. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

concept that guides one's daily life (e.g., sin or kharma).[2] See Figure 18.3[3] for an illustration of symbols from many worldwide religions.

Figure 18.3 Religions

The symbols are arranged in clockwise order starting at the 12:00 position: Judaism, Christianity, Islam, Bahá'í faith, Hinduism, Taoism, Buddhism, Sikhism, Rodnoveril, Celtic paganism, Heathenism, Semitic paganism, Wicca, Kemetism, Hellenic paganism, and Roman paganism.

2. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

3. "RELIGIONES.png" by Niusereset is licensed under CC BY-SA 3.0

Religions

Religions have been classified based on what or whom people worship (if anything). See Table 18.3 for a list of religious classifications.[4]

Table 18.3 Religious Classifications[5]

Religious Classification	What/Who Is Divine	Example
Polytheism	Multiple gods	Belief systems of the ancient Greeks and Romans
Monotheism	Single god	Judaism, Christianity, Islam
Atheism	Nothing	Atheism
Animism	Nonhuman beings (animals, plants, natural world)	Indigenous nature worship
Totemism	Human-natural being connection	Native American beliefs

Every culture has atheists who do not believe in a divine being or entity and agnostics who hold that ultimate reality (such as God) is unknowable. However, being a nonbeliever in a divine being does not mean the individual has no morality. For example, many Nobel Peace Prize winners have classified themselves as atheists or agnostics.[6]

4. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

5. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

6. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

Monotheism includes the religions of Judaism, Christianity, and Islam. People who practice Judaism are called Jews, people who practice Christianity are called Christians, and people who practice Islam are called Muslims. Jews, Christians, and Muslims believe in many of the same historical sacred stories, referred to by Christians as the "Old Testament." In these shared sacred stories, it is believed that the son of God (a messiah) will return to save God's followers. While Christians believe that the messiah has already appeared in the person of Jesus Christ, Jews and Muslims believe the messiah has yet to appear.[7]

The following subsections describe the general beliefs of five worldwide religions. However, as with all cultural beliefs, nurses should recognize an individual's specific spiritual values, beliefs, and practices and not assume they believe in these elements based on the religion they profess.

Judaism

After their exodus from slavery in Egypt in the thirteenth century B.C., Jews became a nomadic society worshipping only one God. The Jewish covenant, a promise of a special relationship with Yahweh (God), is an important element of Judaism. The sacred text of Judaism is the Torah, which contains the same sacred stories in the first five books of the Christian's Bible. Talmud is a collection of additional sacred Jewish oral interpretations of the Torah. Jews emphasize moral behavior and action in life.[8] Jewish religious services are

7. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

8. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

held in a synagogue. See Figure 18.4[9] for an image of the Torah and the Star of David, a traditional symbol of Judaism.

Figure 18.4 The Torah and Star of David

Christianity

Christianity began over 2,000 years ago in Palestine with the birth of a Jew named Jesus Christ. Jesus was a charismatic leader and believed by Christians to be the son of God, who taught his followers to treat others as one would like to be treated. Christians believe that Jesus was crucified as an atonement for humanity's sins. The sacred text for Christians is the Bible that includes the "Old Testament" and the "New Testament." The New Testament describes the life and teachings of Jesus.[10] Christians attend religious services in a church or cathedral. See Figure 18.5[11] for an image of a sculpture depicting Jesus Christ crucified on a cross, a common symbol of Christianity.

9. "star-of-david-458372_960_720.jpg" by hurk is licensed under CC0
10. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology
11. "crucifix-4061847_960_720.jpg" by fz_3d is licensed under CC0

Figure 18.5 Sculpture of Jesus Christ on a Cross

Christianity is broadly split into three branches: Catholic, Protestant, and Orthodox. The Catholic branch is governed by the Pope and many bishops around the world. There are many different denominations of Protestant faiths, such as Lutherans, Baptists, Presbyterians, Methodists, Seventh-Day Adventists, Pentecostals, and Mormons. Although all Christians believe the Bible is a sacred text, different denominations have variations in their sacred texts. For example, The Church of Jesus Christ of Latter-day Saints uses the Book of Mormon that they believe details other parts of Christian doctrine and Jesus' life that aren't included in the Bible. Similarly, the Catholic Bible includes a collection of stories that were part of the King James translation created in 1611 but are no longer included in Protestant versions of the Bible.[12]

Although monotheistic, Christians often describe God through three manifestations called the Holy Trinity: the father (God), the son (Jesus), and the Holy Spirit, similar to how water can be in different forms of ice, water, and gas. Another foundation to Christian faith is the Ten Commandments, a set of

12. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

rules that includes acts considered sinful, such as theft, murder, and adultery.[13]

Islam

Islam is monotheistic religion that follows the teaching of the prophet Muhammad, born in Mecca, Saudi Arabia, in 570 C.E. Muhammad is viewed as a prophet and a messenger of Allah (God), who is divine. The followers of Islam are called Muslims who attend religious services in mosques.[14] See Figure 18.6[15] for an image of a mosque.

Figure 18.6 Mosque

Islam means “peace” and “submission.” The sacred text for Muslims is the Qur’an (or Koran).

13. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology
14. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology
15. “Amman_BW_29.JPG” by Berthold Werner is licensed under CC BY 3.0

Muslims are guided by five beliefs and practices, often called pillars of their faith, including believing that Allah is the only god and Muhammad is his prophet, participating in daily prayer, helping those in poverty, fasting as a spiritual practice, and participating in pilgrimage to the holy center of Mecca.[16]

Hinduism

Hinduism originated in the Indus River Valley about 4,500 years ago in what is now modern-day northwest India and Pakistan. Hindus believe in a divine power that can manifest as different entities. Three main incarnations (Brahma, Vishnu, and Shiva) are sometimes compared to the Christian belief in the Holy Trinity.[17]

Multiple sacred texts, collectively called the Vedas, contain hymns and rituals from ancient India and are mostly written in Sanskrit. Hindus believe in a set of principles called dharma that refers to one's duty in the world and correspond with "right" actions. Hindus also believe in karma, the notion that spiritual ramifications of one's actions are balanced cyclically in this life or a future life (referred to as reincarnation). footnote]Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology[/footnote] Most Hindus observe religious rituals at home. The rituals vary greatly among regions, villages, and individuals. See Figure 18.7[18] for a statue of Shiva in a yogic meditation. Yoga is a Hindu

16. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

17. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

18. "Shiva_Bangalore.jpg" by Kalyan Kumar is licensed under CC BY-SA 2.0

discipline that trains the body, mind, and consciousness for health, tranquility, and spiritual insight.

Figure 18.7 Statue of Shiva in Yogic Meditation

Buddhism

Buddhism is a philosophy founded by Siddhartha Gautama around 500 B.C.E. Siddhartha is believed to have given up a comfortable, upper-class life to follow one of poverty and spiritual devotion. At the age of thirty-five, he famously meditated under a sacred fig tree and vowed not to rise before he achieved enlightenment, called bodhi. After this experience, he became known as Buddha or "enlightened one." Followers were drawn to Buddha's teachings and the practice of meditation, and he later established a monastic order.[19]

Buddha's teachings encourage Buddhists to lead a moral life by accepting

19. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

the four Noble Truths: life is suffering, suffering arises from attachment to desires, suffering ceases when attachment to desires ceases, and freedom from suffering is possible by following the "middle way." The concept of the "middle way" is central to Buddhist thinking and encourages people to live in the present, practice acceptance of others, and accept personal responsibility.[20] See Figure 18.8[21] for a statue of the enlightenment of Buddha.

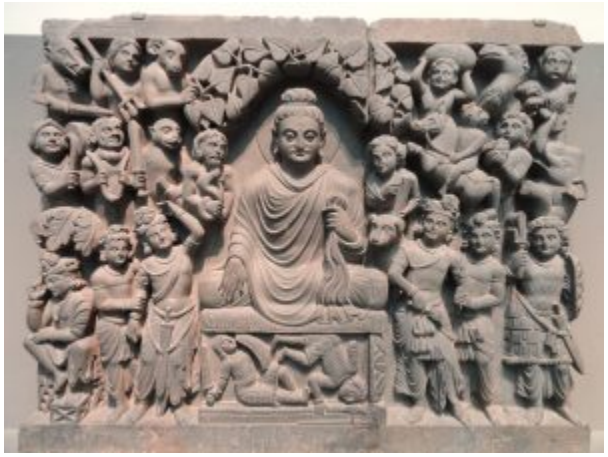

Figure 18.8 Statue of Enlightenment of Buddha

Common Religious Beliefs and Practices

Now that we have reviewed the basic beliefs of various world religions, this section describes common religious beliefs and practices that may impact

20. Griffiths, H., & Keirns, N. (2015). *Introduction to sociology 2E*. OpenStax. https://openstax.org/books/introduction-sociology-2e/pages/1-introduction-to-sociology

21. "Four_Scenes_from_the_Life_of_the_Buddha_-_Enlightenment_-_Kushan_dynasty,_late_2nd_to_early_3rd_century_AD,_Gandhara,_schist_-_Freer_Gallery_of_Art_-_DSC05124.JPG" by Daderot is in the Public Domain, CC0

nursing care. As always, customize nursing interventions according to each client's specific values, practices, and beliefs.

Buddhist Clients

- Buddhism places strong emphasis on "mindfulness," so clients may request peace and quiet for the purpose of meditation, especially during crises.
- Some Buddhists may express strong, culturally based concerns about modesty (for instance, regarding treatment by someone of the opposite sex).
- Some Buddhists are strictly vegetarian and refuse to consume any meat or animal by-product. For such clients, even medications that are produced using animals are likely to be problematic. See Figure 18.9[22] for an image of a vegetarian meal in a Buddhist temple.
- The importance of mindful awareness of all of life's experience may affect clients' or family members' decisions about pain medications out of worry that analgesics may unduly cloud awareness. Nonpharmacological pain management options are often attractive.
- Clients or families may pray or chant out loud repetitiously. This is often done quietly, and any noise concerns in a hospital can usually be negotiated easily. Families sometimes wish to place a picture of the Buddha in the client's room.
- In end-of-life care, Buddhists may be very concerned about safeguarding their awareness/consciousness. Clarification of the client's wishes about the use of analgesics in the days and hours before death is strategically important for developing an ethical pain management plan.
- As a client approaches death, medical and nursing staff should minimize actions that might disturb their concentration or meditation in preparation for dying. Near the time of death, a Buddhist client's family

22. "Vegetarian_meal_at_Buddhist_temple_(3810298969).jpg" by Andrea Schaffer is licensed under CC BY 2.0

may appear quite emotionally reserved and even keep their physical distance from the client's bed. This can be a custom for the purpose of supporting the client's desire to concentrate without distraction on the experience of dying.

- After the client has died, staff should try to keep the body as still as possible and avoid jostling during transport. Buddhism teaches that the body is not immediately devoid of the person's spirit after death, so there is continued concern about disturbing the body. Such belief may also be an impediment to discussion of organ donation.
- Families may request that after a client has died the client's body be kept available to them for a number of hours for the purpose of religious rites. All such requests should be negotiated carefully, maximizing the opportunity for accommodation in recognition of the religious significance.[23]

Figure 18.9 Vegetarian Meal in a Buddhist Temple

23. Ehman, J. (2012). *Religious diversity: Practical points for healthcare providers*. Penn Medicine: Pastoral Care and Education. https://www.uphs.upenn.edu/pastoral/resed/diversity_points.html

Catholic Clients

- Sacraments and blessings by a Catholic priest can be viewed as highly important, especially before surgery or as a perceived risk of death.
- If a client is near death, there may be an urgent request for a Catholic priest to offer "Sacrament of the Sick" (which some Catholics may call "Last Rites"). Even if the sacrament has already been offered, there may still be a request for a priest to offer prayers and bless the client.
- All requests for the sacrament of baptism should be relayed to a Catholic priest. However, if an infant is likely to die before a priest can arrive, the infant may be baptized by any person with proper intent. The person would say, "[name of infant], I baptize you in the name of the Father, and of the Son, and of the Holy Spirit," pouring a small amount of water over the infant's head three times. Emergency baptisms are reported to the local Catholic parish priest.
- Clients may request Holy Communion (Eucharist) prior to surgery. While a Catholic priest or Eucharistic Minister would typically offer such a client only a tiny portion of a wafer, clients who are NPO (to have nothing by mouth) should have this request approved by the care team as medically safe.
- Some clients may keep religious objects with them, such as a rosary (a loop of beads with a crucifix used for prayer), a scapula (a small cloth devotional pendant), or a religious medal. See Figure 18.10[24] for an image of a rosary. If clients request that such an object remain with them during medical procedures, discuss the option of placing the object in a sealed bag that can be kept on or near the client. If an object is metal and the client is having a radiological procedure or test (like an MRI scan), ask the client or family if they can bring in a nonmetal substitute.
- Interruption of religious practices, such as regular attendance at Mass or special observance of special holy days, may be highly stressful to Catholic clients. Discuss contacting clergy and/or a hospital chaplain.

24. "SilverRosary.png" by Aprilwine is licensed under CC BY-SA 3.0

- Clients may have moral questions about treatment decisions such as the withholding/withdrawing of life-sustaining treatment. A priest can offer authoritative guidance in specific situations.
- Clients may request non-meat diets, especially during the time of Lent (the 40 days before the festival of Easter).[25]

Figure 18.10 Rosary

Hindu Clients

- Hindu clients may express strong, culturally based concerns about modesty, especially regarding treatment by someone of the opposite sex. Genital and urinary issues are often not discussed with a spouse present.
- Hindus are often strictly vegetarian and do not consume meat or animal by-products. For such clients, even medications that are produced using animals are likely to be problematic. Some Hindus may also refrain from eating certain vegetables, like onions or garlic.
- Fasting is a common practice in Hinduism, and clients may wish to discuss the implications in light of the medical/dietary care plan.

25. Ehman, J. (2012). *Religious diversity: Practical points for healthcare providers*. Penn Medicine: Pastoral Care and Education. https://www.uphs.upenn.edu/pastoral/resed/diversity_points.html

- The act of washing is generally conceived as requiring running water, either from a tap or (poured) from a pitcher. A client may have a strong desire to wash their hands after meals. See Figure 18.11[26] for an image of a Hindu worshipping with water.
- For many Hindu clients, there is a cultural norm to use the right hand for "clean" tasks like eating (often without utensils) and their left hand for "unclean" tasks like toileting. Medical and nursing staff should consider this right-left significance before hindering a client's hand or arm movement in any way. Discuss these preferences with the client.
- Clients may wear jewelry or adornments that have strong cultural and religious meaning, and staff should not remove these without discussing the matter with the client or family.
- Hinduism teaches that death is a crucial "transition" with karmic implications. There may be a strong desire that death occurs in the home rather than in the hospital. Family may wish to perform a number of pre-death rituals (for example, tying a thread around the person's neck or wrist). After death, family members may request to wash the client's body (by family members of the same sex as the client).
- Family may request constant attendance of the deceased's body. A family member or representative may wish to accompany the body to the morgue (where the person may sit outside any restricted area yet relatively near the body).[27]

26. "hindu-1588337_960_720.jpg" by gauravaroraji0 is licensed under CC0

27. Ehman, J. (2012). *Religious diversity: Practical points for healthcare providers*. Penn Medicine: Pastoral Care and Education. https://www.uphs.upenn.edu/pastoral/resed/diversity_points.html

Figure 18.11 Worship with Water

Jehovah's Witnesses Clients

- The most defining tenant for Jehovah's Witnesses in health care is the strict prohibition against receiving blood (i.e., red blood cells, white blood cells, platelets, or plasma) by transfusion (even the transfusion of a client's stored blood), in medication using blood products, or in food. Even if the client will die in the absence of blood transfusions, such as major trauma, blood products are refused. Nurses must understand that administering a blood transfusion can result in the client being excommunicated from their church and can lead to lawsuits for the health care facility. Some blood fractions (such as albumin, immunoglobulin, and hemophiliac preparations) are allowed, but clients are guided by their own conscience.
- Organ donation and transplantation are allowed, but clients are guided by their own conscience.
- Jehovah's Witnesses are usually well-prepared to work with health care providers to seek all possible options for treatment that do not conflict with religious concerns. It is very common for adults to carry a card at all times stating religiously based directives for treatment without blood.
- Contrary to popular misconceptions, faith-healing is not a part of Jehovah's Witnesses tradition. Prayers are often said for comfort and endurance.
- Tradition of Jehovah's Witnesses does not teach that those who die experience an immediate afterlife. It would be inappropriate to say to the

family of a deceased client, “He’s in a better place now.”
- Jehovah’s Witnesses do not celebrate birthdays or Christian “holidays.”[28]

Jewish Clients

- Some Jewish clients may strictly observe a rule not to “work” on the Sabbath (from sundown on Friday until sundown on Saturday) or on religious holidays. The Sabbath reflects their belief in the creation of the world and “on the 7th day, God rested.” This religious injunction against “work,” including prohibitions against using certain tools or engaging in tasks that initiate use of electricity, may prevent tasks like writing, flipping a light switch, pushing buttons to call a nurse, adjusting a motorized bed, or operating a patient-controlled analgesia (PCA) pump. The tearing of paper can be considered “work,” so roll toilet paper may need to be replaced with an opened box of individual sheets. Medical procedures should not be scheduled during the Sabbath or religious holidays (unless they are lifesaving) nor should hospital discharges be planned during such times without the consent of the client. While these restrictions on “work” are generally associated with Orthodox Judaism, they may be important for any Jewish client.
- Jewish holidays are usually highly significant for clients, especially Passover in the spring and Rosh Hashanah and Yom Kippur in the fall. These holidays may affect the scheduling of medical procedures and may involve dietary changes (related to a need for special food or to a desire to fast). All Jewish holidays run from sundown-to-sundown.
- Jewish clients often request a special Kosher diet in accordance with religious laws that govern the preparation of certain foods (e.g., beef), the prohibition of certain foods (e.g., pork and gelatin), or the combination of some food (e.g., beef served with dairy products). During the holiday of

28. Ehman, J. (2012). *Religious diversity: Practical points for healthcare providers*. Penn Medicine: Pastoral Care and Education. https://www.uphs.upenn.edu/pastoral/resed/diversity_points.html

Passover, an important distinction is made between food that is merely "Kosher" and that which is specifically "Kosher for Passover." Handwashing before eating may have a religious significance.

- Some Jewish clients may have culturally based concerns about modesty, especially regarding treatment by someone of the opposite sex. However, because Jewish tradition holds the expertise of medical practitioners in high regard, this may reduce concerns about treatment by the opposite sex.
- Questions about the withholding or withdrawing of life-sustaining therapy are deeply debated within Judaism, and some Jews are strongly opposed to the idea. Family members often wish to consult with a rabbi about the specific circumstances and decisions regarding end-of-life care.
- After a client has died, Jewish tradition directs that burial happen quickly and that there be no autopsy (unless the autopsy is deemed necessary by a mandate from the Medical Examiner). Embalming procedures and cremation are not permitted according to Jewish tradition. Also, the family may request that a family member or representative constantly accompany the body in the hospital or even to the morgue (where the person may sit outside any restricted area yet relatively near the body) to say prayers and read psalms.
- There may be a request that amputated limbs be made available for burial. Details should be arranged through the client's/family's funeral home.
- Jewish religious laws pose a complex set of restrictions that can affect medical decisions, and clients or family members may request to speak with a rabbi to determine the moral propriety of any particular decision. Exceptions are often made when an action is understood in terms of "saving a life," such as emergency surgery or organ donation during the Sabbath. The value of "saving a life" is held in extremely high regard in Jewish tradition.
- It is common for male Jewish clients to wear a yarmulke or kippah (skull cap) during prayer, and some Jews may wish to keep them on at all times. Clients or family members may wear prayer shawls and use phylacteries (two small boxes containing scriptural verses and having leather straps,

worn on the forehead and forearm during prayer). There may be a request that at least ten people (called a minyan) be allowed in the client's room for prayer. See Figure 18.12[29] for an image of a skull cap worn during prayer.

- A Jewish person need not be religious to identify culturally as "Jewish" and may observe Jewish religious traditions for cultural reasons.
- The word "Jew" is commonly used within Jewish culture, but non-Jews should be mindful of its complex historical connotations that can sometimes be perceived as disrespectful when spoken by non-Jews.[30]

Figure 18.12 Skull Caps (Kippa)

Muslim Clients

- Muslim clients may express strong concerns about modesty, especially regarding treatment by someone of the opposite sex. A Muslim woman

29. "Casamento_judeu1.jpg" by David Berkowitz is licensed under CC BY 2.0

30. Ehman, J. (2012). *Religious diversity: Practical points for healthcare providers*. Penn Medicine: Pastoral Care and Education. https://www.uphs.upenn.edu/pastoral/resed/diversity_points.html

may need to cover her body completely and should always be given time and opportunity to do so before anyone enters her room. Women may also request that a family member be present during an exam and may desire to remain clothed during an exam if at all possible. Muslim men may find examination by a woman to be extremely challenging. Nudity is emphatically discouraged. There should be no casual physical contact by non-family members of the opposite sex (such as shaking hands). Some Muslims may avoid eye contact as a function of modesty.

- Muslims may specifically request a diet in accordance with religious laws for "Halal" food, though many Muslims opt for a vegetarian diet as a simple way to avoid religious prohibitions against such things as pork products or gelatin. Forbidden foods are referred to as "Haram."
- Muslim dietary regulation can affect clients' use of medications, especially drugs that have pork origins or that contain gelatin or alcohol. The dietary prohibition against alcohol has occasionally raised questions about Muslims' use of alcohol-based hand rubs in the hospital. Because hand rubs do not have an intoxicating effect and are used for life-saving hygiene, any concern should be addressed thoroughly and sensitively and perhaps with the input of an imam. An imam is a person who leads prayers in a mosque.
- The act of washing may require running water, either from a tap or poured from a pitcher. As a result, Muslim clients typically do not feel truly cleaned by a sponge bath. Many Muslims wash with running water before and after meals and also before prayers.
- Muslim prayers are conducted five times a day. Clients may desire to pray by kneeling and bending to the floor, but Islamic tradition recognizes circumstances when this is not medically advisable. If clients are disturbed by their inability to pray on the floor, advice should be encouraged from an imam. See Figure 18.13[31] for an image of Muslim men prostrate in prayer.
- Muslim clients may react to suffering with emotional reserve and may

31. "Mosque.jpg" by Antonio Melina/Agência Brasil is licensed under CC BY 3.0

hesitate to express the need for pain management. Some may even refuse pain medication if they understand the experience of their pain to be spiritually enriching.

- There may be a request that amputated limbs be made available for burial. Details should be arranged through the client's/family's funeral home.
- Muslim tradition generally discourages the withholding or withdrawing of life-sustaining therapy. However, because decisions on this subject involve the particular circumstances of the client and the complexities of medical treatments, family members who are morally conflicted may wish to bring an experienced imam into their discussion with physicians.
- A family member may request to be present with a dying person, so as to be able to whisper a proclamation of faith in the client's ear right before death. (Similarly, a husband may request to be present at a birth to whisper a proclamation of faith in the ear of the newborn.)
- After a death, the family may request to wash the client and to position their bed to face Mecca. The client's head should rest on a pillow.
- Burial is usually accomplished as soon as possible. Muslim families rarely allow for autopsy unless there is an order by a Medical Examiner. Some Muslims may consider organ donation, but the subject is open to great differences of opinion within Islamic circles.
- During the thirty-day month of Ramadan, Muslims refrain from food and drink from dawn until sundown. Physicians should explore with clients whether it is medically appropriate to fast while in the hospital. If so, investigate options for predawn meals, for providing clients with dates and spring water in the late afternoon (a traditional way to break the daily fast), and for delaying dinner until after sunset. While anyone who is ill is not obligated to fast, the Ramadan observance can be powerfully meaningful to clients if they can participate. The month of Ramadan shifts according to a lunar calendar, and when it occurs during the summertime, longer days can make the fast more physically stressful.[32]

32. Ehman, J. (2012). *Religious diversity: Practical points for healthcare providers.*

Figure 18.13 Muslim Men Prostrate in Prayer

Pentecostal Clients

- Pentecostal clients may pray exuberantly. Noise concerns in a hospital can sometimes present a problem in this regard, but simply shutting the door to the client's room can usually provide an adequate solution.
- Pentecostals may pray by "speaking in tongues," expression of words that seem unintelligible to an individual hearer but holds very deep religious significance for worshippers.
- Clients or families may request that relatively large numbers of people be allowed in the client's room for prayer.
- Clients or families may express strong belief in miraculous healing.[33]

Penn Medicine: Pastoral Care and Education. https://www.uphs.upenn.edu/pastoral/resed/diversity_points.html

33. Ehman, J. (2012). *Religious diversity: Practical points for healthcare providers*. Penn Medicine: Pastoral Care and Education. https://www.uphs.upenn.edu/pastoral/resed/diversity_points.html

18.4 Applying the Nursing Process

OPEN RESOURCES FOR NURSING (OPEN RN)

Now that we have reviewed the concepts related to spirituality and discussed beliefs and practices of common world religions, let's apply the nursing process to promoting spiritual health.

Assessment

Subjective Assessment

Agencies often provide a standardized spiritual assessment tool to complete when a client is admitted. If a standardized assessment tool is not available, the FICA model can be used. The FICA model contains open-ended questions to ask clients about their personal spiritual beliefs in a way that is open and nonjudgmental[1]:

- **F-Faith or beliefs:** What are your spiritual beliefs? Do you consider yourself spiritual? What things do you believe in that give meaning to life?
- **I-Importance and influence:** Is faith/spirituality important to you? How has your illness and/or hospitalization affected your personal practices /beliefs?
- **C-Community:** Are you connected with a faith center in the community? Does it provide support/comfort for you during times of stress? Is there a

1. Dameron, C. M. (2005). Spiritual assessment made easy... With acronyms! *Journal of Christian Nursing, 22*(1). https://www.nursingcenter.com/journalarticle?Article_ID=725343&Journal_ID=642167&Issue_ID=725337

person/group/leader who supports/assists you in your spirituality?
- **A-Address:** What support can we provide to support your spiritual beliefs/practices?

The HOPE tool is also helpful for incorporating spiritual assessment questions into a medical interview. HOPE stands for[2]:

- **H:** Sources of hope, meaning, comfort, strength, peace, love and connection
- **O:** Organized religion
- **P:** Personal spirituality and practices
- **E:** Effects of spirituality on medical care and end-of-life issues

The first part of the mnemonic, **H**, refers to asking about the client's sources of hope and basic spiritual resources, without focusing on religion. This approach initiates therapeutic communication with all clients regarding spirituality beyond traditional religion.

The second and third letters, **O** and **P**, refer to inquiring about the importance of religious rituals and specific aspects of their spiritual practices that are important to them. A useful way to introduce these questions is a normalizing statement such as: "For some people, their religious or spiritual beliefs act as a source of comfort and strength in dealing with life's ups and downs. Is this true for you?"

The fifth letter, **E**, refers to the effects of a client's spirituality and beliefs on decisions related to medical care and end-of-life issues. This may include barriers accessing preferred spiritual resources during medical treatment, fears related to end-of-life issues, and decisional conflicts related to the client's values and beliefs and prescribed treatment.

2. Anandarajah, G., & Hight, E. (2001). Spirituality and medical practice: Using the HOPE questions as a practical tool for spiritual assessment. *American Family Physician. 63*(1), 81-9. https://www.aafp.org/afp/2001/0101/p81.html

Read more information about using the HOPE tool.

Objective Assessment

In addition to asking open-ended questions, it is important for the nurse to observe clients for cues indicating difficulties in finding meaning, purpose, or hope in life. It is also important to monitor for supportive relationships.[3]

Clients experiencing chronic or serious illness may make statements indicating spiritual distress that should cue the nurse that spiritual care is needed. Examples of these statements/concepts are as follows:

- Lack of Meaning: "I am not the person I used to be."
- Hope: "I have nothing left to hope for."
- Mystery: "Why me?"
- Isolation: "All my family and friends are gone."
- Helplessness: "I have no control over my life anymore."[4]

Diagnoses

See Table 18.4 for selected NANDA-I diagnoses associated with spiritual health.

3. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 869-872.

4. Puchalski, C. M., Vitillo, R., Hull, S. K., & Reller, N. (2014). Improving the spiritual dimension of whole person care: Reaching national and international consensus. *Journal of Palliative Medicine, 17*(6), 642–656. https://doi.org/10.1089/jpm.2014.9427

Table 18.4 Selected NANDA-I Nursing Diagnoses Related to Spiritual Health[5]

5. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

NANDA-I Diagnosis	Definition	Selected Defining Characteristics
Readiness for Enhanced Spiritual Well-Being	A pattern of integrating meaning and purpose in life through connectedness with self, others, the world, and/or a power greater than oneself, which can be strengthened	• Expresses desire to enhance coping • Expresses desire to enhance satisfaction with life • Expresses desire to enhance forgiveness from others • Expresses desire to enhance interaction with significant other • Expresses desire to enhance hope • Expresses desire to enhance service to others • Expresses desire to enhance creative energy • Expresses desire to enhance spiritual reading • Expresses desire to enhance oneness with nature • Expresses desire to enhance participation in religious practices • Expresses desire to enhance prayerfulness
Impaired Religiosity	Impaired ability to exercise reliance on beliefs and/or participate in rituals of a particular faith tradition	• Desires to reconnect with previous belief pattern • Difficulty adhering to prescribed religious beliefs and/or rituals • Expresses distress about separation from the faith community

Spiritual Distress	A state of suffering related to the impaired ability to integrate meaning and purpose in life through connections with self, others, the world, and/or a power greater than oneself.	• Anger behaviors • Crying • Fatigue • Fear • Questions identity • Questions meaning of life • Questions meaning of suffering

Sample Nursing Diagnosis Statements

Readiness for Enhanced Spiritual Well-Being

A sample PES statement is, *Readiness for Enhanced Spiritual Well-Being as evidenced by expressed desire to increase time outdoors and be closer to nature*. The nurse could encourage clients to visit local parks and walk outdoors.

Recall that when a PES statement is created for a health promotion diagnosis, the defining characteristics are provided as evidence of the desire of the client to improve their current health status.

Impaired Religiosity

Hospitalized clients may be unable to attend religious services they are accustomed to attending. This contributes to impaired religiosity, which occurs when life circumstances, such as hospitalization, illness, stress, substance use disorder, or other factors negatively affect faith, spirituality, or

the ability to maintain faith or spirituality practices.[6] A sample PES statement is, "*Impaired Religiosity related to environmental barriers to practicing religion as evidenced by difficulty adhering to prescribed religious beliefs.*" The nurse could contact the client's pastor to arrange a visit or determine if services can be viewed online.

Spiritual Distress

Events that place clients at risk for developing spiritual distress include birth of a child, death of a significant other, exposure to death or traumatic events, a life transition, or terminal care. Associated conditions that place a person at risk for developing spiritual distress include chronic disease, depression, loss of a body part, loss of function of a body part, or a treatment regimen.[7]

For example, a client diagnosed with life-threatening medical diagnoses like cancer may experience spiritual distress as they move through the typical stages of loss. A sample PES statement is, *"Spiritual Distress related to anxiety associated with illness as evidenced by crying, insomnia, and questioning the meaning of suffering.*" A nurse would implement interventions to enhance coping.

Outcome Identification

Goals and SMART outcomes should be customized to each client and their situation.

When a client has the nursing diagnosis *Readiness for Enhanced Spiritual Well-Being*, a sample goal statement is, "*The client will demonstrate hope as evidenced by the following indicators: expressed expectation of a positive future, faith, optimism, belief in self, sense of meaning in life, belief in others,*

6. Nanddiagnoses.com. (n.d.). *Impaired religiosity.* https://nandadiagnoses.com/impaired-religiosity

7. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

and inner peace."[8] An example of a related SMART outcome is, "*The client will express a sense of meaning and purpose in life by discharge*."[9]

When a client has the nursing diagnosis *Spiritual Distress*, a sample goal statement is, "*The client will demonstrate improved spiritual health as evidenced by one of the following indicators: feelings of faith, hope, meaning, and purpose in life with connectedness with self and others to share thoughts, feelings, and beliefs*."[10] A sample SMART outcome is, "*The client will express a purpose in life by discharge*."[11]

Planning Interventions

Providing Spiritual Care

When providing spiritual care, the RN must not impose their religious or spiritual beliefs on the client. There are several guidelines for therapeutically implementing nursing interventions to support clients' spiritually:

- **Take cues from the client:** When bringing up spiritual health with clients,

8. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 869-872.
9. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 869-872.
10. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 869-872.
11. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 869-872.

understand this may be a difficult topic for them to discuss. Let them lead the conversation and do not press further than they want to share. Also, be aware of the client's nonverbal cues. They may be saying one thing, but their body language is saying something different. Gently point out the contradiction and seek clarification. For example, a client may state that they don't blame God for their illness but begin to tear up as they say it. By responding, "I noticed you became tearful when you said that...what is causing the tears," the door is opened for them to share more of their thoughts and feelings.

- **Ask the client how you can support them spiritually:** An important way to assist a client with their spiritual health is to ask them what they need to feel supported in their faith and then try to accommodate their requests, if possible. For example, perhaps they would like to speak to their clergy, spend some quiet time in meditation or prayer without interruption, or go to the onsite chapel. Explain that spiritual health helps the healing process. Many agencies have chaplains onsite that can be offered to clients as a spiritual resource.
- **Support clients within their own faith tradition:** Because clients can sometimes feel as if they are a captive audience, it is not appropriate for the nurse to take this opportunity to attempt to persuade a client towards a preferred religion or belief system. The role of the nurse is to respect and support the client's values and beliefs, not promote the nurse's values and beliefs.
- **Listen to a client's fears and concerns without adding your own stories:** In an effort to empathize with a client who is telling their story, it is easy for the nurse to start adding personal examples from their own life. Although this may seem helpful, it is usually only distracting and shifts the focus from the client to the nurse. Focus on the client's fears and concerns. Name and validate the emotions that are heard when possible. Sometimes clients don't realize what they are feeling until it is pointed out to them.
- **Pray with a client if requested (or provide someone who will):** Some nurses may feel reluctant to pray with clients when they are asked for various reasons. They may feel underprepared, uncomfortable, or unsure

if they are "allowed to." Nurses are encouraged to pray with their clients to support their spiritual health, as long as the focus is on the client's preferences and beliefs, not the nurse's. It is helpful to ask the client what they would like you to pray about. See Figure 18.14[12] for an image of a nurse praying with a client. Having a short, simple prayer ready, that is appropriate for any faith, may help in this situation. If a nurse does not feel comfortable praying, the chaplain should be requested to participate in prayer with the client.

- **Share an encouraging thought or word:** Similar to the preceding prayer suggestion, a scripture verse (based on the client preferences) or an inspirational poem may be helpful to share during difficult times. Having a few verses or thoughts readily available can be very helpful during critical moments.[13]
- **Use presence and touch:** Sometimes the mere presence of a nurse is spiritually comforting for clients. Words are not always needed. It can be very comforting to know that someone will be sitting quietly next to them as they fall asleep or are in pain. Touch can also be a very powerful therapeutic tool to provide comfort (after asking permission of the client).[14]

12. "Praying_with_Patient.jpg" by Ahs856 is licensed under CC BY-SA 4.0

13. Nourian, F. (2018, March 16). *9 ways to provide spiritual care to your patients & their families.* AdventHealth. https://careers.adventhealth.com/blog/9-ways-to-provide-spiritual-care-to-patients-and-their-families

14. Nourian, F. (2018, March 16). *9 ways to provide spiritual care to your patients & their families.* AdventHealth. https://careers.adventhealth.com/blog/9-ways-to-provide-spiritual-care-to-patients-and-their-families

Figure 18.14 Nurse Praying with a Client

See the following box for a summary of therapeutic interventions that nurses can implement to provide spiritual support. Review additional interventions for enhancing coping for clients and family members experiencing grief in the "Grief and Loss" chapter.

Therapeutic Nursing Interventions to Provide Spiritual Support[15,16]

- Use therapeutic communication to establish trust and empathetic caring.
- Be available to actively listen to feelings and express

15. Wagner, C. M., Butcher, H. K., & Clarke, M. F. (2024). *Nursing interventions classification (NIC)* (8th ed.). Elsevier.

16. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 869-872.

empathy.

- Treat with dignity and respect.
- Determine the importance of faith or beliefs for the client or family (e.g., attendance of religious services, scheduled prayer sessions, or adherence to religious rituals)
- Encourage life review through reminiscence.
- Be open to expressions of concern, loneliness, or powerlessness.
- Provide privacy and quiet time for spiritual activities.
- Be aware of religious rules, celebrations, and customs that may affect nursing care (e.g. dietary restrictions, fasting, blood transfusions, or free-flowing water for cleansing).
- Facilitate use of meditation, prayer, and other religious traditions and rituals.
- Pray with the individual, as appropriate.
- Provide spiritual music, literature, radio, television, or online programs as appropriate.
- Instruct about methods of relaxation, mediation, and guided imagery, as appropriate.
- Arrange visits with the chaplain, clergy, or spiritual advisor.
- Promote hope however the individual defines it for their situation without providing false reassurance.
- Encourage forgiveness.
- Encourage participation in interactions with family members, friends, and others.
- Encourage participation in support groups.

Implementing Interventions

Nurses should support clients' spiritual and religious preferences when implementing interventions to support their spiritual well-being. The nurse

should respect and listen to the client's expression of beliefs and not impose their own beliefs on the client. Spiritual or religious practices should be accommodated if safe and feasible to do so. If a client has a spiritual belief, value, or practice that conflicts with their treatment plan, the nurse should explain the rationale for the intervention or treatment. If the client is not willing to complete the treatment as planned due to their spiritual or religious beliefs, the nurse should attempt to negotiate the treatment plan with the client and/or health care provider. For example, a nurse can advocate for rescheduling a procedure after the Sabbath or modifying the dietary plan and medication administration times during Ramadan.

Evaluation

When evaluating the effectiveness of interventions in promoting a client's spiritual health, refer to the overall goal, "*The client will demonstrate spiritual health as evidenced by the following indicators: feelings of faith, hope, meaning, and purpose in life with connectedness with self and others*."[17] From there, review the client's progress toward the personalized SMART outcomes that have been customized to their situation.

17. Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 869-872.

18.5 Spiritual Care of Self

OPEN RESOURCES FOR NURSING (OPEN RN)

Provision 5 of the American Nurses Association Code of Ethics states, “The nurse owes the same duties to self as to others, including the responsibility to promote health and safety, preserve wholeness of character and integrity, maintain competence, and continue personal and professional growth.”[1] Spiritual care is associated with better health and well-being for everyone, including nurses and nursing students. A desire to help others in need is an important part of spirituality, which has been described as a life-giving force based on faith, discovering meaning and purpose in life, and offering the gift of self to others.[2]

Spiritual resources can help nurses and nursing students overcome the emotional toil associated with caring for seriously ill and dying clients and prevent compassion fatigue and burnout. Read more about compassion fatigue and burnout in the “Grief and Loss” chapter.

Many spiritual traditions use contemplative practices to increase compassion, empathy, and quiet the mind. Examples of contemplative practices and other methods to build spiritual strength include the following[3]:

1. American Nurses Association. (2015). *Code of ethics for nurses with interpretive statements*. American Nurses Association. https://www.nursingworld.org/practice-policy/nursing-excellence/ethics/code-of-ethics-for-nurses/coe-view-only/

2. Rudolfsson, G., Berggren, I., & da Silva, A. B. (2014). Experiences of spirituality and spiritual values in the context of nursing – An integrative review. *The Open Nursing Journal, 8*, 64–70. https://doi.org/10.2174/1874434601408010064

3. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

- Meditation can induce feelings of calm and clear-headedness and improve concentration and attention. Research has shown that meditation increases the brain's gray matter density, which can reduce sensitivity to pain, enhance the immune system, help regulate difficult emotions, and relieve stress. Mindfulness meditation in particular has been proven helpful for people with depression and anxiety, cancer, fibromyalgia, chronic pain, rheumatoid arthritis, type 2 diabetes, chronic fatigue syndrome, and cardiovascular disease.[4]
- Yoga is a centuries-old spiritual practice that creates a sense of union within the practitioner through physical postures, ethical behaviors, and breath expansion. The systematic practice of yoga has been found to reduce inflammation and stress, decrease depression and anxiety, lower blood pressure, and increase feelings of well-being.[5]
- Journaling can help a person become more aware of their inner life and feel more connected to experiences. Studies show that writing during difficult times may help a person find meaning in life's challenges and become more resilient in the face of obstacles. When journaling, it can be helpful to focus on three basic questions: What experiences give me energy? What experiences drain my energy? Were there any experiences today where I felt alive and experienced "flow"? Allow yourself to write freely, without stopping to edit or worry about spelling and grammar.[6]
- Prayer can elicit the relaxation response, along with feelings of hope, gratitude, and compassion, all of which have a positive effect on overall well-being. There are several types of prayer rooted in the belief that there is a higher power that has some level of influence over one's life. This

4. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

5. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

6. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

belief can provide a sense of comfort and support in difficult times. A recent study found that clinically depressed adults who believed their prayers were heard by a concerned presence responded much better to treatment than those who did not believe.[7]

- Find a spiritual community and friends. Join a spiritual group, such as a church, synagogue, temple, mosque, meditation center, yoga class, or other local group that meets to discuss spiritual issues. The benefits of social support are well-documented, and having a spiritual community to turn to for fellowship can provide a sense of belonging and support.[8]
- Nurture your relationships with family, significant others, and friends. Relationships aren't static – they are living, dynamic aspects of our lives that require attention and care. To benefit from strong connections with others, you should take charge of your relationships and put in the time and energy you would any other aspect of your well-being. It can be helpful to create rituals together. With busy schedules and the presence of online social media that offer the façade of real contact, it's very easy to drift from friends. Research has found that people who deliberately make time for gatherings or trips enjoy stronger relationships and more positive energy. An easy way to do this is to create a standing ritual that you can share and that doesn't create more stress, such as talking on the telephone on Fridays or sharing a walk during lunch breaks.[9]
- Mindfulness can be defined as awareness that arises through paying attention, on purpose, in the present moment, and nonjudgmentally. It has also been described as, nonelaborative, nonjudgmental, present-centered awareness in which each thought, feeling, sensation that arises

7. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

8. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

9. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

is acknowledged and accepted as it is. Mindfulness helps us be present in our lives and gives us some control over our reactions and repetitive thought patterns. It helps us pause, get a clearer picture of a situation, and respond more skillfully. Compare your default state to mindfulness when studying for an exam in a difficult course or preparing for a clinical experience. What do you do? Do you tell yourself, "I am not good at this" or "I am going to look stupid"? Does this distract you from paying attention to studying or preparing? How might it be different if you had an open attitude with no concern or judgment about your performance? What if you directly experienced the process as it unfolded, including the challenges, anxieties, insights, and accomplishments, while acknowledging each thought or feeling and accepting it without needing to figure it out or explore it further? If practiced regularly, mindfulness helps a person start to see the habitual patterns that lead to automatic negative reactions that create stress. By observing these thoughts and emotions instead of reacting to them, a person can develop a broader perspective and can choose a more effective response.[10]

- Spending time in nature is cited by many individuals as a spiritual practice that contributes to their mental health.[11]

> Explore additional resources about developing spiritual well-

10. Delagran, L. (n.d.). *What is spirituality?* University of Minnesota. https://www.takingcharge.csh.umn.edu/what-spirituality

11. Yamada, A., Lukoff, D., Lim, C., & Mancuso, L. (2020). Integrating spirituality and mental health: Perspectives of adults receiving public mental health services in California. *Psychology of Religion and Spirituality, 12*(3), 276–287. https://doi.org/10.1037/rel0000260

being to avoid burnout at the University of Minnesota's Earl E. Bakken Center for Spirituality & Healing.

18.6 Putting It All Together

Client Scenario

Mr. Yun is a 34-year-old man presenting to his physician's office with complaints of difficulty concentrating, sadness, and anxiety. The client recently experienced the loss of his wife in a motor vehicle accident and reports difficulty sleeping and weight loss of greater than 15 pounds in the previous month. He reports feeling "hopeless" and "angry at God" for the loss that he has experienced. He states he used to attend religious services with his wife, but "That was really more of 'her' thing. I really don't know what to believe anymore."

Applying the Nursing Process

Assessment: The nurse notes that the client is experiencing difficulty concentrating, feelings of sadness and hopelessness, and reported anxiety. He self-reports feeling hopeless, feelings of anger toward God, and uncertainty in his belief system.

Based on the assessment information that has been gathered, the following nursing care plan is created for Mr. Yun:

Nursing Diagnosis: *Spiritual Distress related to loss of challenged belief system as manifested by self-reported "hopelessness," being "angry at God," and general uncertainty in beliefs.*

Overall Goal: *The client will demonstrate improved spirituality.*

SMART Expected Outcome: *By the end of the teaching session, Mr. Yun will describe a spiritual practice that provides him comfort.*

Planning and Implementing Nursing Interventions:

The nurse will identify the factors that influence the client's personal belief system. The nurse will provide support to the client and allow the client to express emotions and anger. The nurse will observe and listen empathetically in the communication experience. The nurse will encourage the use of spiritual resources and ask the client permission to contact a chaplain.

Sample Documentation:

Mr. Yun exhibits signs of spiritual distress in relation to the loss of his personal belief system as the result of his wife's recent death. He verbalizes anger, hopelessness, and uncertainty in his belief system. However, he states he does find comfort in spending time outdoors in nature. A chaplain has been contacted with the client's permission to address Mr. Yun's spiritual needs.

Evaluation:

At the end of the teaching session, the nurse explains that with his permission, a chaplain will call Mr. Yun at home to follow up. Mr. Yun grants permission for the referral. The nurse asks what other spiritual resources Mr. Yun plans to use at home. Mr. Yun explains that he will purposefully go for daily walks outdoors to spend time in nature. The SMART outcome was "met."

18.7 Learning Activities

OPEN RESOURCES FOR NURSING (OPEN RN)

Learning Activities

(Answers to "Learning Activities" can be found in the "Answer Key" at the end of the book. Answers to interactive activity elements will be provided within the element as immediate feedback.)

1. Mr. Hernandez is a 73-year-old client admitted with end-stage heart failure, COPD, and diabetes. He appears anxious and verbalizes "I think this is the end" when he is admitted to the medical-surgical unit. As you complete the admission assessment, the client asks, "Do you believe in God?" Utilizing the FICA model, what questions might you ask to gain insight into the client's personal spiritual beliefs?

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1989#h5p-74

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1989#h5p-43

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=1989#h5p-44

NEXT GEN RN

Test your knowledge using this NCLEX Next Generation-style bowtie question. You may reset and resubmit your answers to this question an unlimited number of times.[1]

NEXT GEN RN

Test your knowledge using this NCLEX Next Generation-style assignment. You may reset and resubmit your answers to the questions in this assignment an unlimited number of times.[2]

1. "Chapter 18 Assignment 1" by Tami Davis for OpenRN is licensed under CC BY-NC 4.0

2. "Chapter 18 Assignment 2" by Rebecca Wicks for OpenRN is licensed under CC BY-NC 4.0

XVIII Glossary

OPEN RESOURCES FOR NURSING (OPEN RN)

Chaplains: Trained professionals in hospitals, nursing homes, assisted living facilities, and hospices that assist with the spiritual, religious, and emotional needs of clients, families, and staff. Chaplains support and encourage people of all religious faiths and cultures and customize their approach to each individual's background, age, and medical condition. (Chapter 18.2)

Religion: A unified system of beliefs, values, and practices that a person holds sacred or considers to be spiritually significant. Spiritual practices often unite a moral community called a church. Some people associate religion with a place of worship (e.g., a synagogue or church), a practice (e.g., attending religious services, receiving communion, or going to confession), or a concept that guides one's daily life (e.g., sin or kharma). (Chapter 18.3)

Spiritual distress: A state of suffering related to the impaired ability to integrate meaning and a purpose in life through connections with self, others, the world, and/or a power greater than oneself. (Chapter 18.2)

Spirituality: A dynamic and intrinsic aspect of humanity through which persons seek ultimate meaning, purpose, and transcendence and experience relationships to self, family, others, community, society, nature, and the significant or sacred. Spirituality is expressed through beliefs, values, traditions, and practice. (Chapter 18.2)

Transcendence: An understanding of being part of a greater picture or of something greater than oneself, such as the awe one can experience when walking in nature. It can also be expressed as a search for the sacred through subjective feelings, thoughts, and behaviors. (Chapter 18.2)

PART XIX

CARE OF THE OLDER ADULT

19.1 Care of the Older Adult Introduction

Learning Objectives

- Consider all aspects of diversity, including age
- Differentiate between normal and abnormal findings for older adults
- Detail specific adaptations in client care to accommodate the needs of older adults

The needs of the older adult population will continue to influence health care through this century. The aging "baby boomer" population, along with an increased average life span of Americans, has led to an increased number of older adults and is only expected to grow. The U.S. Census Bureau projects that 1 in 5 Americans will be over the age of 65 by 2030, and by 2034, the number of older individuals will outnumber children for the first time in U.S. history.[1]

Each individual ages in their own way, and the physical, psychosocial, and cognitive health of older individuals varies widely. Because of this broad scope of health and illness in the aging population, providing nursing care that

1. United States Census Bureau. (2018). *Older people projected to outnumber children for the first time in U.S. history*. https://www.census.gov/newsroom/press-releases/2018/cb18-41-population-projections.html

meets the needs of each older adult can be challenging. Additionally, although there are common physiological changes that occur with aging, many individuals ignore symptoms by erroneously attributing them to the aging process. For example, many older adults mistakenly believe that pain from arthritis is a normal part of growing older and do not seek treatment, resulting in decreased physical activity that puts them at increased risk for developing chronic disease. Providing individualized nursing care and health teaching to older adults can promote effective preventative health care and self-management that maintains and enhances their quality of life.[2] Let's begin by reviewing basic concepts related to the aging process.

2. Sarkisian, C. A., Hays, R. D., Berry, S., & Mangione, C. M. (2002). Development, reliability, and validity of the expectations regarding aging (ERA-38) survey. *The Gerontologist, 42*(4), 534-542. https://doi.org/10.1093/geront/42.4.534

19.2 Basic Concepts

Ageism

Gerontology is the study of the social, cultural, psychological, cognitive, and biological aspects of aging. There are many stereotypes and negative attitudes about aging adults that persist in the US and around the world. This bias can be linked to a general lack of knowledge about the aging process and misunderstandings about older adults. Because of these influences, many individuals have anxiety about aging that can lead to negative stereotypes of older individuals. This is known as **ageism**, which is the stereotyping and discrimination against individuals or groups on the basis of their age.[1]

Ageism among nurses and other health care professionals puts older people at risk. Research has demonstrated that ageism in health care negatively impacts older adults' overall health, well-being, and quality of care received. Ageism results in increased risks of mortality, poor functional health, and slower recovery times from illness. Negative perceptions about aging can also lead to poor mental health and depression.[2] As you read this chapter, think about your own attitudes about aging and how these beliefs may impact the care you provide.

1. Merz, C. C., Stark, S. L., Morrow-Howell, N. L., & Carpenter, B. D. (2016). When I'm 64: Effects of an interdisciplinary gerontology course on first-year undergraduates' perceptions of aging. *Gerontology & Geriatrics Education, 39*(1), 35-45. https://doi.org/10.1080/02701960.2016.1144600

2. Burnes, D., Sheppard, C., Henderson, C. R., Wassel, M., Cope, R., Barber, C., & Pillemer, K. (2019). Interventions to reduce ageism against older adults: A systematic review and meta-analysis. *American Journal of Public Health, 109*(8), e1-e9. https://doi.org/10.2105/AJPH.2019.305123

Read more at "What is Ageism in Healthcare and What Can We Do About It?" by GoodRx Health.

Integrity Versus Despair

Aging individuals must continually adjust to changes in health and physical strength, lifestyle changes as a result of retirement, the loss of significant others, and changing roles and relationships with family members and friends. As a result, older individuals may find it difficult to accept the changes associated with aging. Nurses can support older adults in maintaining a positive self-image and outlook by considering Erikson's theory of development. Erikson's theory of development describes the stage of older adulthood as "Integrity versus Despair." This stage begins at approximately age 65 and ends at death. During this stage, older adults reflect on their accomplishments and the person they have become. If they feel they have led a successful life, they often feel satisfied and develop a sense of integrity. Conversely, individuals who feel unsuccessful or do not feel they achieved their life goals often feel unsatisfied and may experience hopelessness and despair that can lead to depression. Nurses can assist older adults in developing a sense of integrity by encouraging the client to reminiscence about previous positive life events and relationships and cultivate a positive mindset of guiding the next generation.[3]

Many older adults, especially those with declining health due to chronic disease, acknowledge that changes in their health status and mobility threaten the autonomy and independence they previously experienced throughout adulthood. As a result, many older adults strive to be autonomous, so they are not overly reliant on others for their daily care. They

3. Orenstein, G. A. (2022). *Erikson's stages of Psychosocial Development*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK556096/

often engage in self-management activities in response to changes in their health and physical strength, ranging from simple daily tasks, such as medication management, to more complex tasks, such as relocating to new residences that are better suited to their changes in physical and mental health. Research has found that when older adults are faced with declines in their physical health and/or cognitive abilities, they often draw upon experiences and skills acquired in earlier adulthood for the purpose of self-managing their new conditions. They reflect on their resilience used to overcome significant challenges faced in earlier adulthood and then apply skills and knowledge gained through previously productive activities to managing their new health changes. However, not all older adults have sufficient personal and external resources to devote towards successful self-management of their health conditions. Nurses can assist older adults by personalizing health self-management strategies that emphasize their existing skill sets and knowledge.[4]

Other Considerations

Retirement

In addition to the physiological changes that occur with aging, older adults vary in their level of activity. For example, many older adults continue working into their seventies and beyond. Individuals may choose to continue to work because of their sense of purpose or because of a need for income. Some older individuals experience a loss of identity when they retire because their work role was an important aspect of their life. Retirement can bring a sense of freedom and adventure, as well as a need to find new identity and purpose.

4. Perry, T. E., Ruggiano, N., Shtompel, N., & Hassevoort, L. (2014). Applying Erikson's wisdom to self-management practices of older adults: Findings from two field studies. *Research on Aging, 37*(3), 253-274. https://doi.org/10.1177/0164027514527974

Social Isolation

Retirement and the loss of daily interaction with coworkers, as well as death of family members and friends, can lead to social isolation in the aging population. Social support impacts a person's health and quality of life and should be included as part of the assessment. It is helpful for nurses to be familiar with community resources that provide socialization opportunities and provide referrals for clients in need of additional services.

Modified Living Environment

Although many aging adults live in assisted living facilities or skilled nursing centers, many older adults prefer to live at home. Modifications may be needed to the home environment to promote safety and independence. For example, grab bars, elevated toilet seats, and other modifications may be needed in the bathroom, along with good lighting, minimization of clutter, and removal of rugs throughout the home. Assessment of the home environment for safety and ease of mobility is an important aspect of home care nursing.

If an older adult requires more care than family members are able to provide at home, nurses provide valuable information about available care options and make referrals to social workers and case managers. There are a wide variety of community-based resources to enhance care for older adults. Local aging and disability resource centers (ADRCs) can help facilitate referrals based on specific needs of the older adult. Examples of other resources include adult day centers, home health agencies that provide in-home personal care and nursing services, community-based residential facilities (CBRFs), and residential care apartment complexes (RCACs). If an older adult requires 24-hour nursing care, placement in a nursing home (also referred to as a skilled nursing facility) may be required. Use the following box to read more information about nursing home resources provided by the Centers for Medicare and Medicaid (CMS).

- Learn more about nursing home resources by reviewing the Nursing Home Resource Center provided by the Centers for Medicare and Medicaid (CMS).

19.3 Applying the Nursing Process

Applying the Nursing Process: Assessment

When performing a comprehensive assessment on an older adult, the findings are used to establish their baseline status of physical, cognitive, psychosocial, and spiritual well-being. It is appropriate to consider the potential impact of declining strength and physical functioning on their psychological status using Erikson's developmental stage of "Integrity versus Despair." It is also important to consider the impact of chronic disease on their ability to function and complete Activities of Daily Living (ADLs). Many older adults who are able to perform ADLs without assistance consider themselves healthy.

When performing an assessment on an older adult, modification of communication techniques may be required, as discussed in the "Sensory Impairments" and "Cognitive Impairments" chapters. It is important to allow adequate time for older individuals to reply to questions thoughtfully and to move through the requests contained in a physical assessment comfortably.

It is helpful to use an evidence-based tool to assess for frequent needs of older adults, such as the Fulmer SPICES tool. The **SPICES tool** focuses on areas of common problems for aging individuals and can lead to early intervention and treatment. The SPICES tool includes assessment of the following:

S: Sleep Disorders
P: Problems with Eating or Feeding
I: Incontinence
C: Confusion
E: Evidence of Falls

S: Skin Breakdown[1]

> Read more details about using the SPICES tool.

Several free assessment tools for common issues in older adults are located at The Hartford Institute of Geriatric Nursing website. Use the box below to explore available tools.

> Download free assessment tools from the "Try This: Series" at the Hartford Institute of Geriatric Nursing.[2]

Unexpected Findings

While cognitive impairment and memory deficits are not considered normal aspects of aging, there are common expected physiological changes that occur with aging. Nurses should be familiar with these expected findings so that deviations from the expected can be adequately addressed. See Table

1. Fulmer, T. (2019). Fulmer *SPICES: An overall assessment tool for older adults.* The Hartford Institute for Geriatric Nursing, New York University, Rory Meyers College of Nursing. https://hign.org/sites/default/files/2020-06/Try%20This%20General%20Assessment%201.pdf
2. The Hartford Institute for Geriatric Nursing, New York University. (n.d.). *Try This:® Series Assessment Tools for Best Practices of Care for Older Adults.* Rory Meyers College of Nursing. https://hign.org/consultgeri-resources/try-this-series

19.3 for a comparison of expected versus unexpected findings in an older adult that require notification of the health care provider.[3]

Table 19.3 Expected Versus Unexpected Findings[4]

3. Boss, G. R., & Seegmiller, J. E. (1981). Age-related physiological changes and their clinical significance. *The Western Journal of Medicine, 135*(6), 434–440.

4. Boss, G. R., & Seegmiller, J. E. (1981). Age-related physiological changes and their clinical significance. *The Western Journal of Medicine, 135*(6), 434–440.

Assessment	Expected Findings	New Unexpected Findings to Report to the Health Care Provider
Cardiovascular system	• Walls of blood vessels thicken; vessels narrow and lose elasticity • Valves become less efficient; calcification is noted • Peripheral circulation decreases and systolic blood pressure increases • Cardiac output decreases • Decreased sensitivity of baroreceptors	• New hypertension • Orthostatic hypotension • Vital signs out of normal ranges ***CRITICAL CONDITIONS requiring immediate notification or contact of emergency services: Chest pain; symptomatic hypotension or hypertension; new onset or changes in oxygenation**
Respiratory system	• Decreased cough reflex • Increased chest wall rigidity • Decreased lung compliance • Fewer alveoli	• Vital signs out of normal ranges ***CRITICAL CONDITIONS requiring immediate notification or contact of emergency services: Hemoptysis; decreased oxygen saturation levels not responding to treatments; labored breathing**

Musculoskeletal system	• Loss of muscle mass and strength • Increased subcutaneous tissue deposits • Joint changes (degeneration) • Loss of bone density • Decreased proprioception	• New changes in strength or mobility • Falls ***CRITICAL CONDITIONS requiring immediate notification or contact of emergency services: Sudden onset of unilateral weakness, facial drooping, or slurred speech; falls with suspected injury**
Genitourinary system	• Decreased renal perfusion; fewer nephrons • Decreased bladder capacity • Female: reduction in sphincter tone • Male: prostate enlargement	• New difficulties with urination (frequency, urgency, incontinence, hesitation, retention, pain) ***CRITICAL CONDITIONS requiring immediate notification or contact of emergency services: Urine output less than 30 mL/hour**

Gastrointestinal system	• Decreased salivary and gastric secretions • Decreased gut motility • Reduced production of intrinsic factor • Hemorrhoids • Impaired rectal sensation	• Constipation • Black stool • Blood in stool • Liquid seepage of stool • Nausea • Vomiting • Diarrhea • Loss of appetite • Unintended weight loss ***CRITICAL CONDITIONS requiring immediate notification or contact of emergency services: Absent bowel sounds or rigid, distended abdomen**
Integumentary system	• Decreased elasticity of skin • Changes in pigmentation • Thinning, greying hair • Slower nail growth • Sweat and oil gland atrophy • Lesions associated with aging such as skin tags and seborrheic keratosis	• Suspicious moles, lesions, or lumps • Skin breakdown • Rashes • Signs of infection in a skin wound

Endocrine system	• Altered hormone production • Reduced ability to adapt to stress • Decreased thyroid function • Decreased insulin sensitivity	• Changes in sleep patterns • Unintended weight changes • Blood glucose levels out of range ***CRITICAL CONDITIONS requiring immediate notification or contact of emergency services: Symptomatic blood glucose less than 50 or greater than 400**[5]
Immune system	• Decreased core temperature elevation • Decreased thymus size • Decreased T-cell function	• Redness, warmth, tenderness, fever, or other signs of infection • Change in mental status and confusion suggestive of infection ***CRITICAL CONDITIONS requiring immediate notification or contact of emergency services: Suspected or actual infection with two or more of the following signs indicating possible sepsis: Temperature > 38 C or <36 C, Heart rate > 90 bpm, Respiratory rate > 20 or PaCO2 < 32, WBC > 12,000 or < 4,000 or over 10% immature forms or bands**[6]

5. Patolia, S. (2023). *Gluose*. Medscape. https://emedicine.medscape.com/article/2087913-overview

Reproductive system	• Females: decreased estrogen levels; atrophy of uterus, vagina, and breasts; vaginal irritation, dryness • Males: erectile dysfunction	• Vaginal bleeding • Breast lump

Health Promotion

One of the goals of Healthy People 2030 is to improve the health and well-being for older adults. It is estimated that by 2060 almost a quarter of the U.S. population will be age 65 or older. Older adults are at higher risk for chronic health problems like diabetes, osteoporosis, and Alzheimer's disease. In addition, 1 in 3 older adults fall each year, with falls being a leading cause of injury for this age group. Older adults are also more likely to go to the hospital for infectious diseases such as pneumonia, which is a leading cause of death for this age group. Nurses can ensure older adults get preventive care, including vaccines to protect against the flu and pneumonia, to help them stay healthy. Other goals for older adults established by Healthy People 2030 include early detection of dementia with appropriate intervention; decreased hospitalization for urinary infections, falls, and pneumonia; decreased incidence of medication-related safety issues; improved physical activity; improved oral health; decreased complications of osteoporosis; and reduced vision loss from macular degeneration.[7]

Nurses can advocate for improved health care for older adults while actively

6. Chakraborty, R. K., & Burns, B. (2023). *Systemic inflammatory response syndrome*. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK547669/

7. Healthy People 2030. (n.d.). *Older adults*. https://health.gov/healthypeople/objectives-and-data/browse-objectives/older-adults

involving them in decisions about their care and promoting their quality of life. Common areas of health promotion for older adults include nutrition, physical activity, safe medication use, and psychosocial well-being.

Nutrition

Heart disease, cancer, chronic lung disease, and stroke are the leading causes of death in older adults. Nurses can provide health teaching that focuses on good nutrition, physical activity, smoking cessation, and moderate alcohol use to promote improved health outcomes.[8] However, nutrition can pose special challenges for the older adult. Chewing can be a problem if there are difficulties with dentition. Lack of oral care, missing teeth, or poorly fitting dentures can cause individuals to avoid intake of healthy foods. Regular dental care should be encouraged when working with older adults. Finances often impact nutritional intake when older adults have difficulty meeting their basic needs of housing, food, and health care. Additionally, the inability to plan, shop, and prepare meals because of activity intolerance, cognitive impairments, or physical limitations can impact nutrition. Nurses can initiate referrals to social workers or case managers for assistance with financial or health care concerns, as well as promote community resources such as Meals on Wheels or senior citizen meal site centers. Assisting individuals to meet their nutritional needs is an important aspect of health promotion.

Read more about promoting good nutrition in the "Nutrition" chapter.

Physical Activity

Physical activity is important throughout the life span. Older individuals may

8. Centers for Disease Control and Preventive Medicine. (2021). *Leading causes of death.* https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm

be limited in their ability to engage in physical activity due to various factors such as physical limitations, pain, and fear of falling. Musculoskeletal problems, such as impaired balance and arthritis, can impair an individual's ability to walk or participate in regular exercise. Helping older adults find appropriate ways to maintain activity is an important nursing intervention. Nurses can advocate for the older adult by encouraging them to regularly attend health care checks with their provider and discuss concerns that limit their activity. Older adults should be reassured that pain is not considered a normal part of aging and can be effectively treated so they can maintain physical activity comfortably.

Read more about promoting activity and joint range of motion in the "Mobility" chapter.

Safe Medication Use

Because of the increased incidence of chronic disease, many older adults take multiple medications to manage their symptoms and conditions. Polypharmacy, the use of many medications, increases a person's risk of adverse medication effects. Older adults may be prescribed medications by multiple providers, and they can become confused when attempting to safely manage their daily medication use. There are also changes in absorption, distribution, metabolism, and excretion of drugs as an individual ages that impact the safe use of any medications.

The American Geriatrics Society maintains a list of medications to potentially avoid or use with caution in older adults because of the risk for harm. This list is called "AGS Beers Criteria." Updated reports are published in

the *Journal of the American Geriatric Society*.[9] Use the following box to view the most current report.

> Read more about the Beers Criteria with rationale for why the listed medications may be inappropriate for older adults on the American Geriatric Society website.

In addition to cautiously using medications listed on the ABG Beers Criteria list with older adults, nurses can promote other safety strategies with medications. For example, older adults should have all of their medications prescribed from multiple providers filled at the same pharmacy to check for interactions and replications. It is also helpful to use a daily pill dispenser to ensure medications are taken as prescribed.

Nurses should also perform medication reconciliation during all clinic visits and on admission to health care agencies to review the client's current use of all medications.

> Read more about medication reconciliation in the "Preventing Medication Errors" section of the "Legal/Ethical" chapter in Open RN *Nursing Pharmacology, 2e*.

Psychosocial Well-Being

As individuals age, they often experience loss of significant others, family members, and friends. These losses create increased risk for social isolation and depression. Poor mobility and transportation issues can also add to social isolation. As male older adults experience multiple losses, their risk for suicide

9. American Geriatric Society. (2023). *American Geriatric Society updated Beers criteria for potentially inappropriate medication use in older adults*. https://geriatricscareonline.org/ProductAbstract/american-geriatrics-society-updated-beers-criteria-for-potentially-inappropriate-medication-use-in-older-adults/CL001

increases.[10] Nurses can provide information about community resources and outreach programs to promote social interaction for individuals experiencing isolation.

Older adults are also at risk for other safety issues, such as elder abuse and financial exploitation. Read more about safety considerations for older adults in the "Safety" chapter.

Aging individuals continue to have sexual needs, and this aspect of their overall health should not be ignored. Assessment of these needs allows the nurse to integrate these aspects into the client's plan of care and make appropriate referrals when necessary.

Adapting Health Teaching

As discussed throughout this chapter, there are many considerations when working with the older adult population and promoting optimal health and quality of life. It is also important to modify teaching methods depending on the individual's knowledge, skills, and abilities. For example, some older adults readily engage in using electronic technology, but others have low digital literacy or experience difficulty when accessing electronic health resources. Nurses should adapt health teaching to the needs of the individual and provide verbal, written, or electronic resources as needed, while considering any sensory, cognitive, or functional impairments. The ultimate goal of health promotion and health teaching is to improve their understanding, motivation, and engagement in self-management and promote their quality of life.

10. Centers for Disease Control and Prevention (n.d.). *Injury prevention and control*. https://www.cdc.gov/injury/index.html

19.4 Learning Activities

Learning Activities

(Answers to "Learning Activities" can be found in the "Answer Key" at the end of the book. Answers to interactive activity elements will be provided within the element as immediate feedback.)

1. Mr. Yang is an 87-year-old client admitted to the medical-surgical floor due to a recent fall at home. His wife reports that the client has become increasingly frail and unsteady. Utilizing the SPICES tool, develop a list of assessment questions for Mr. Yang to determine potential problems and subsequent interventions.

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=3701#h5p-95

Test your knowledge using this NCLEX Next Generation-style highlight text question. You may reset and resubmit your

- answers to the questions in this assignment an unlimited number of times.[1]

Test your knowledge using this interactive case study.

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://wtcs.pressbooks.pub/nursingfundamentals/?p=3701#h5p-96

[2]

1. "Chapter 19 Assignment 1" by Rebecca Wicks for OpenRN is licensed under CC BY-NC 4.0

2. "Functional Ability Case Study"" by Susan Jepsen for Lansing Community College is licensed under CC BY 4.0

XIX Glossary

Ageism: The stereotyping and discrimination against individuals or groups on the basis of their age. (Chapter 19.2)

Gerontology: The study of the social, cultural, psychological, cognitive, and biological aspects of aging. (Chapter 19.2)

SPICES tool: Focuses on areas of common problems for aging individuals and can lead to early intervention and treatment. (Chapter 19.3)

PART XX

ANSWER KEY

Chapter 1 (Scope of Practice)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 1 Learning Activities

1. When given instruction to titrate medications independently, the nursing student should recognize that this is outside of their scope of practice and training. The nursing student should inform the nurse that within the student role, they are not able to complete this action because it is outside of their practice scope. The nursing student should also report this instruction promptly to their instructor so that appropriate follow-up can be taken with the nurse regarding re-education and review of the principles of safe delegation.
2. It is important to acknowledge that the conversation that is occurring in the breakroom is a violation of HIPAA. If a staff member is not involved in client care, disclosure of client care information is a violation of client privacy and confidential health information. It is important to voice one's concern regarding the disclosure of private health information and remind all staff of the importance of adherence to HIPAA requirements within a health care setting.

Answers to interactive elements are given within the interactive element.

Chapter 2 (Communication)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 2 Learning Activities

2. It is important to take action to limit the distractions within the environment when communicating with Mr. Curtis. Upon entry into the room, introductions, and initial building of rapport, it would be helpful to identify a few key family members who might contribute to the admission history, provided that Mr. Curtis consents to discuss admission details in front of family members who are present. Other family members should be excused from the room for a short period of time while the admission history is conducted to maintain privacy and reduce distractions. Other factors to consider include limitation to noise distraction within the environment. For example, closing the door to the hallway and turning off the television may be helpful. If Mr. Curtis uses any assistive devices, such as hearing aids or eyeglasses, these should also be encouraged. Finally, it is important that the nurse consider therapeutic strategies to enhance communication. Sitting across from Mr. Curtis, making eye contact, and creating an open, approachable, nonhurried demeanor can help to facilitate the information exchange.

Answers to interactive elements are given within the interactive element.

Chapter 3 (Diverse Patients)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 3 Learning Activities

2. It is important to demonstrate professional respect for a client's cultural beliefs, background, and practices when providing care. You can ensure appropriate actions are taken by introducing yourself with name and role, asking preference on how the individual would like to be addressed, attending to personal space of the client, following client and family lead for eye contact behaviors, using inclusive language, etc. It is important to note the client's language of preference and enlist in interpreter services if a communication barrier is noted. Additionally, it is important to be honest regarding individual level of understanding about one's cultural beliefs. Ask polite questions and seek clarification to avoid misunderstanding. It is important to remember that asking a question such as, "Do you understand?," may result in the client saying "Yes" even though they do not fully understand. Furthermore, asking a question like, "Do you have any questions?," may result in the client saying "No" even if they have questions due to embarrassment, lack of confidence, or cultural deference to authority figures.

Answers to interactive elements are given within the interactive element.

Chapter 4 (Nursing Process)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 4 Learning Activities

Box 4: Scenario C:

Subjective data:

"I am so short of breath."

"My ankles are so swollen I have to wear my house slippers."

"I am so tired and weak that I can't get out of the house to shop for groceries."

"I'm afraid to get out of bead because I get so dizzy."

Objective data:

Bilateral basilar crackles in the lungs

Bilateral 2+ pitting edema of the ankles and feet

Increase weight of ten pounds in three weeks

Furosemide use (a medication that eliminates excess fluid from the body)

Serum potassium level of 3.4 mEq/L

Oxygen saturation 91% on room air

Respiratory rate 28 breaths per minute

Secondary data:

Daughter reports, "We are so worried about mom living at home by herself when she is so tired all the time!"

Care Plan Activity Answers:

The client, Mark S., is a 57-year-old male who was admitted to the hospital with "severe" abdominal pain that was unable to be managed in the Emergency Department. The physician has informed Mark that he will need to undergo some diagnostic tests. The tests are scheduled for the morning.

After receiving the news about his condition and the need for diagnostic tests, Mark begins to pace the floor. He continues to pace constantly. He keeps asking the nurse the same question ("How long will the tests take?") about his tests over and over again. The client also remarked, "I'm so uptight I will never be able to sleep tonight." The nurse observes that the client avoids eye contact during their interactions and that he continually fidgets with the call light. His eyes keep darting around the room. He appears tense and has a strained expression on his face. He states, "My mouth is so dry." The nurse observes his vital signs to be Temperature 98 degrees F, Pulse 104, Respiratory Rate 30, and Blood Pressure 180/96. The nurse notes that his skin is diaphoretic and cool to the touch.

1. Group (cluster) the objective and subjective data.

Objective Data:

- 57 years old
- Paces the floor
- Avoids eye contact
- Fidgets with call light
- Eyes dart around room
- Temp 98 degrees F

- Pulse 104
- Blood pressure 180/96
- He is diaphoretic
- Skin is cool to touch
- Appears tense
- Strained expression on face

Subjective Data:

- Male
- Severe abdominal pain
- "I'm so uptight that I will never be able to sleep tonight."
- "My mouth is so dry."

*Note that "male" is subjective data in this case because the client identifies as a male and reports that he is a male. Without a clear definition, sex is what the client reports.

2. Create a problem-focused nursing diagnosis (hypothesis).

Anxiety related to need for diagnostic testing as manifested by increased heart rate, pacing the floor, avoiding eye contact, diaphoretic and cool to the touch skin, appearing tense, dry mouth, and states, "I'm so uptight I will never be able to sleep tonight."

This is an actual nursing diagnosis because the client is experiencing and exhibiting symptoms of anxiety.

3. Develop a broad goal and identify an expected outcome in "SMART" format.

Goal: *The client will have reduced anxiety.*

Expected Outcome in SMART format: *The client will verbalize*

effective coping mechanisms to decrease his feelings of anxiety in the next two hours.

4. Outline three interventions for the nursing diagnosis with associated rationale. Cite an evidence-based source.

Potential interventions include:

- Use a calm, reassuring approach.
- Explain all procedures, including sensations likely to be experienced during the procedure.
- Seek to understand the client's perspective of a stressful situation.
- Provide factual information concerning diagnosis, treatment, and prognosis.
- Encourage verbalization of feelings, perceptions, and fears.
- Provide diversional activities geared toward the reduction of tension.
- Control stimuli, as appropriate, for client needs.
- Instruct the client on the use of relaxation techniques.
- Administer prescribed medications to reduce anxiety as appropriate.

Source: Ackley, B., Ladwig, G., Makic, M. B., Martinez-Kratz, M., & Zanotti, M. (2020). *Nursing diagnosis handbook: An evidence-based guide to planning care* (12th ed.). Elsevier, pp. 144-147.

5. Imagine that you implemented the interventions you identified. Evaluate the degree to which the expected outcome was achieved.

The client verbalized effective coping mechanisms to decrease anxiety in the next two hours. Outcome was met.

Answers to interactive elements are given within the interactive element.

Chapter 5 (Safety)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 5 Learning Activities

1. Risk factors include hip fracture, morphine pain medication, diminished eyesight and hearing, ambulates with walker with one assist, weakness on right side, and experience of recent fall.

2. Morse Fall Risk Assessment Scoring:

- History of fall – 25
- Walker – 15
- Weak Gait -10
- Total: 50 – High Risk

3. Additional interventions to address risk factors:

- Provide adequate lighting and night-light
- Encourage rest
- Use assistive devices, glasses and hearing aids

4. Potential response: “Mr. Moore, your safety is most important, and we need to ensure you do not fall. If you have a bowel movement, we will clean it up. Moving forward, it may be helpful for us to have a commode chair closer to your bedside, so we do not need to travel so far if urgency arises.”

Answers to interactive elements are given within the interactive element.

Chapter 6 (Cognitive Impairments)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 6 Learning Activities

Scenario A

1. In the immediate postoperative period, it is important to assess for signs of infection, electrolyte imbalances, confusion related to new medications, and hypoxia.

2. Table 1

	Dementia	Delirium	Depression
Onset	Vague, insidious onset; symptoms progress slowly	Sudden onset over hours and days with fluctuations	Onset often rapid with identifiable trigger or life event such as bereavement
Symptoms	Symptoms may go unnoticed for years. May attempt to hide cognitive problems or may be unaware of them. Often disoriented to time, place, and person. Impaired short-term memory and information processing. Confusion is often worse in the evening (sundowning)	Often disoriented to time, place, and person. Impaired short-term memory loss and information processing. Confusion is often worse in the evening	Obvious at early stages and often worse in the morning. Can include subjective complaints of memory loss
Consciousness	Normal	Impaired attention/ alertness	Normal
Mental State	Possibly labile mood. Consistently decreased cognitive performance	Emotional lability with anxiety, fear, depression, aggression. Variable cognitive performance	Distressed/ unhappy. Variable cognitive performance
Delusions/Hallucinations	Common	Common	Rare
Psychomotor Disturbance	Psychomotor disturbance in later stages	Psychomotor disturbance present – hyperactive, purposeless, or apathetic	Slowed psychomotor status in severe depression

Based upon the client's sudden exacerbation of symptoms, she would most likely be exhibiting signs of delirium related to her recent surgery. Triggers could include recent surgery, medications, lack of adequate sleep, being in an unfamiliar environment, under-treated pain, or possible infection.

3. Interventions include the following:

- Control the environment. Make sure that the room is quiet and well-lit, have clocks or calendars in view, and encourage family members to visit.
- Administer prescribed medications, including those that control aggression or agitation and pain relievers if there is pain.
- Ensure the client has their glasses, hearing aids, or other assistive devices for communication in place. Lack of assistive sensory devices can worsen delirium.
- Avoid sedatives. Sedatives can worsen delirium.
- Assign the same staff for client care when possible.

Scenario B

1. Symptoms of moderate Alzheimer's disease include the following:

- Require assistance with reminders to eat, wash, and use the restroom.
- Lack of recognition of family and friends.
- Behavioral symptoms such as wandering, getting lost, hallucinations, delusions, and repetitive behavior may occur.
- Clients living at home may engage in risky behavior, such as leaving the house in clothing inappropriate for weather conditions or leaving the stove burners on.

2. Additional assessments would include assessing for signs of physical discomfort, changes in the environment that may be contributing to the increased anxiety or confusion, and communication pattern.

3. Strategies for therapeutic response:

- Back off and ask permission before performing care tasks. Use calm, positive statements, slow down, add lighting, and provide reassurance. Offer guided choices between two options when possible. Focus on pleasant events and try to limit stimulation.
- Use effective language. When speaking, try phrases such as, "May I help you? Do you have time to help me? You're safe here. Everything is under control. I apologize. I'm sorry that you are upset. I know it's hard. I will stay

with you until you feel better."

- Listen to the person's frustration. Find out what may be causing the agitation and try to understand.
- Check yourself. Do not raise your voice, show alarm or offense, corner, crowd, restrain, criticize, ignore, or argue with the person. Take care not to make sudden movements out of the person's view. Maintain special awareness of the client's hands, feet, and other body parts to avoid being kicked, hit, or bitten by the client if they suddenly become combative.

4. Medications may include the following:

- Donepezil (Aricept), approved to treat all stages of Alzheimer's disease
- Galantamine (Razadyne), approved for mild-to-moderate stages
- Rivastigmine (Exelon), approved for mild-to-moderate stages
- Memantine (Namenda) and a combination of memantine and donepezil (Namzaric) are by approved the FDA for treatment of moderate to severe Alzheimer's.

Answers to interactive elements are given within the interactive element.

Chapter 7 (Sensory Impairments)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 7 Learning Activities

1. Answers to “Activity 1” will be individualized based on the assessment findings that are identified in the data collection with your student peer or simulated client.

Answers to interactive elements are given within the interactive element.

Chapter 8 (Oxygenation)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 8 Learning Activities

1. Potential interventions to improve breathing pattern and lung capacity include coughing and deep breathing, use of an incentive spirometer, use of an acapella flutter valve to mobilize secretions, increased fluids to thin secretions, frequent ambulation to mobilize secretions, and keep the head of the bed elevated.

Answers to interactive elements are given within the interactive element.

Chapter 9 (Infection)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 9 Learning Activities

1. Based upon Ms. Jamison's current vital signs and presenting condition, one would suspect the client might be septic. Her current vital signs reflect an elevated temperature > 100.4 and a tachycardic heart rate. Additionally, based upon the client's history, one would suspect she has an unresolved urinary tract infection.

Answers to interactive elements are given within the interactive element.

Chapter 10 (Integumentary)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 10 Learning Activities

1. It would be helpful to assess the sacral area to identify the stage the pressure injury. It would also be helpful to assess Mr. Johns' albumin level to properly identify nutritional inadequacies and protein levels for wound healing.
2. Individual factors that increase vulnerability to pressure injury development include weakness, diminished sensation (related to his stroke), diminished mobility, frequent incontinence, and decreased nutritional intake.

Answers to interactive elements are given within the interactive element.

Chapter 11 (Comfort)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 11 Learning Activities

Client Scenario Colon Cancer & Pain Management

1. What additional assessments (subjective and objective) will you perform and why?

Additional assessments include a full respiratory, abdominal, and pain assessment. It is important to include Mr. Jones' subjective statements related to these systems, as well as observable findings. It would be important to collect information related to lung sounds, observed breathing effort, color of sputum, and reports of shortness of breath. Additionally, the client should be assessed for guarding, grimacing, and self-reporting pain. The client may not be getting out of bed and ambulating due to pain, but the lack of ambulation is causing additional problems for the client. With the colon resection and lack of ambulation, it would also be important to determine the client's bowel function. Abdominal sounds, ability to pass flatus, last bowel movement, and signs of nausea are important for determining bowel motility. It is also important to assess Mr. Jones's understanding of the PCA pump. Can he demonstrate how to use it correctly?

2. List the top three priority nursing diagnoses for Mr. Jones.

Potential priority diagnoses for Mr. Jones might include the following:

- Ineffective Breathing Pattern
- Acute Pain
- Impaired Mobility
- Activity Intolerance
- Constipation

3. Mr. Jones states, "I don't want to use morphine. I am afraid I will become addicted to it like my friend did after he came home from the war." How

will you respond to therapeutically address his concerns, yet also teach Mr. Jones about good pain management?

It would be important to dispel myths for the client regarding pain management and addiction. Mr. Jones should receive education that the use of opioids is appropriate for the treatment of acute surgical pain in the short-term. He should receive instruction that by omitting the use of pain medications, his pain response has led to decreased mobility, which is causing respiratory complications for him.

4. What are common side effects of opioids and how will you plan to manage these side effects for Mr. Jones?

Common side effects of opioids are decreased respiratory rate, decreased bowel motility, and increased lethargy. Of significant concern for Mr. Jones is the potential impact of the opioid on his bowel function. The surgical intervention and lack of mobility have already placed him at risk for constipation. It will be important for the client to resume a sufficient bowel regimen with adequate fluids, ambulation, stool softeners, high-fiber foods, and laxatives if needed.

5. Emotional issues could also be affecting Mr. Jones' perception of pain. What will you further physically assess and therapeutically address?

With Mr. Jones's diagnosis of colon cancer, there can be many personal coping challenges that the client is experiencing. It is important to encourage Mr. Jones to verbalize his feelings related to his diagnosis and understand what resources might best help facilitate his individual coping.

6. After providing health teaching about morphine and the PCA pump, you check on Mr. Jones later in the day and notice he has had five injections and 15 attempts in the past hour. What further assessments will you perform?

It will be important to assess the insertion site where the pain medication is infusing to be certain that the tubing is not kinked and that the medication is actually reaching the client. Additionally, Mr. Jones should receive health teaching about use of the pump and guidelines regarding self-administration to ensure he understands the administration parameters appropriately. He should also have a thorough pain assessment completed, and the nurse

should collect information to report to the prescribing physician regarding the use of medication and client response.

Answers to interactive elements are given within the interactive element.

Chapter 12 (Sleep and Rest)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 12 Learning Activities

Scenario A

A nurse is caring for a client who has been hospitalized after undergoing hip-replacement surgery. The client complains of not sleeping well and feels very drowsy during the day.

1. The client may be experiencing pain that is disrupting the sleep pattern. Additionally, the inpatient hospital setting may present unintended interruptions such as assessment and vital sign collection.

2. The nurse should assess the client's pain level, general comfort, and self-reported feeling of restfulness upon awakening. The nurse should also carefully examine the client's rest pattern by asking questions regarding length of rest, period of wakefulness, and intervals with which these occur throughout the day.

3. The client will have uninterrupted rest of six hours each night during their hospitalization.

4. The nurse should consider pain medication intervention and strategies to create a therapeutic and restful environment. This includes minimizing interruptions overnight, clustering cares and interventions, and limiting noise or distractions. The nurse should also consider if sleep aids are needed while being mindful of the impact of these medication aids in relation to fall risk. The nurse should also take measures to advocate for quiet rest periods for the client during the day.

5. The nurse would determine the effectiveness of interventions by monitoring the client's level of alertness throughout the daytime hours and evaluating the client's self-reported level of energy and ability to participate in therapy and care activities.

Scenario B

A nurse is assigned to work rotating shifts and develops difficulty sleeping.

1. Rotating shifts impact an individual's sleep pattern because of the disruption to one's circadian rhythm.

2. Symptoms of insomnia include lying awake for a long time before falling asleep, sleeping for only short periods, waking up too early in the morning or during the night and not being able to get back to sleep, waking up feeling unrested, difficulty focusing on tasks, irritability, anxiousness, and depression.

3. Healthy sleep habits include the following:

- Sleep in a cool, quiet place. Avoid artificial light from the TV or electronic devices, as this can disrupt your sleep-wake cycle.
- Go to sleep and wake up around the same times each day, even on the weekends. If you can, avoid night shifts, irregular schedules, or other things that may disrupt your sleep schedule.
- Avoid caffeine, nicotine, and alcohol close to bedtime.
- Get regular physical activity during the daytime (at least five to six hours before going to bed).
- Avoid daytime naps, especially in the afternoon.
- Eat meals on a regular schedule and avoid late-night dinners to maintain a regular sleep-wake cycle.
- Limit how much fluid you drink close to bedtime.
- Learn new ways to manage stress.
- Avoid certain over-the-counter and prescription medicines that can disrupt sleep (for example, some cold and allergy medicines).

Answers to interactive elements are given within the interactive element.

Chapter 13 (Mobility)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 13 Learning Activities

1. The nurse should perform a comprehensive pain assessment using a framework such as “PQRST” or “OLDCARTES” and treat Ms. Curtis’s pain according to assessment findings. The nurse should use therapeutic communication techniques to determine why the client is refusing to attend physical therapy. For example, the nurse could ask, “Can you help me understand the reasons you have not attended your previous physical therapy appointments?,” keeping in mind that pain and fear of falling are common causes. It is often helpful to premedicate the client with analgesics before attending physical therapy. If currently prescribed medications are not effective, the provider should be notified.
2. Ms. Curtis is at risk for complications of immobility, such as pneumonia, deep vein thrombosis, constipation, and skin breakdown. The nurse should assess for signs of these complications, as well as educate the client regarding signs to report.
3. A SMART outcome (established with Ms. Curtis) could be, *“The client will attend the next scheduled physical therapy appointment and report effective pain management during and after the session.”*
4. The nurse will monitor the client’s pain level using a pain intensity scale one hour prior to physical therapy and administer prescribed medications according to current pain level and anticipated pain level. The nurse will use therapeutic communication to determine the client’s causes for declining physical therapy appointments and plan interventions accordingly. The nurse will encourage rest before and after physical therapy appointments. The nurse will encourage coughing and deep breathing to prevent pneumonia and range-of-motion exercises while in bed or sitting to prevent deep vein thrombosis. The nurse will perform hourly rounding to encourage repositioning to prevent skin breakdown.

The nurse will encourage fiber and fluids to prevent constipation.

5. The nurse will evaluate if interventions were successful by referring to the established SMART outcome and monitoring if the client attends the next scheduled physical therapy appointment and if pain was effectively managed during the session.

Answers to interactive elements are given within the interactive element.

Chapter 14 (Nutrition)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 14 Learning Activities

Scenario 1

1. It would be important to assess Mr. Jones's swallowing, bowel sounds, ability to pass flatus, abdominal distention, and any complaints of nausea.
2. When transitioning the client from NPO status, the client would be started on clear liquids to ensure dietary tolerance, followed by full liquids, prior to progression toward solid foods.

Scenario 2

1. Mrs. Casey's BMI is 15, placing her in the "Underweight" category because it is below 18.5.
2. Mrs. Casey's hemoglobin (hgb), white blood cells (WBC) and albumin levels are all low, which may be caused by poor intake of protein. Magnesium levels may be low due to poor nutritional intake or can also be caused by excessive alcohol intake.
3. The nurse should perform a general survey on Mrs. Casey, paying close attention to her energy level and mobility deficits as a result of the stroke. The nurse should ask Mrs. Casey about her typical 24-hour food intake, swallowing abilities, appetite, food allergies, and food shopping and preparation activities.
4. Imbalanced Nutrition: Less than Body Requirements related to insufficient dietary intake as evidenced by BMI 15 and albumin level 10 g/mL.
5. Mrs. Casey's BMI will increase to at least 16 in the next month with a continued upward trend.
6. The nurse will contact the provider and request a referral for a dietician. The nurse will contact the facility's social worker regarding promoting

nutritional intake with Meals on Wheels and other in-home services. The nurse will monitor food/fluid ingested daily and caloric intake in collaboration with the dietician and encourage nutritional supplements as prescribed. The nurse will encourage the client to select or order preferred foods for mealtimes. The nurse will ensure that oral care is performed before meals and that foods are presented in an attractive, pleasing manner. The client will be placed in a seated position before eating, the meal tray set up, and assistance provided according to the client's needs.

7. The nurse will evaluate the effectiveness of interventions by monitoring the client's weekly weights and assessing if her BMI is trending upward according to the previously established SMART goal.

Answers to interactive elements are given within the interactive element.

Chapter 15 (Fluids & Electrolytes)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 15 Learning Activities

Scenario A

1. Interpret Mr. Smith's ABG result on admission.
    1. Step 1: Evaluate the pH: The pH is abnormally low at 7.30, below 7.35, indicating acidosis.
    2. Step 2: Evaluate the PaCO2: The PaCO2 is abnormally elevated above 45 at 50, causing the acidosis. The PaCO2 is moving in the opposite direction of the pH, so a respiratory problem is causing the acidosis, called respiratory acidosis.
    3. Step 3: HCO3- level is elevated above 26 at 27, so we know the acidosis is not caused by a metabolic problem. This also indicates the kidneys are trying to compensate for the respiratory problem.
    4. Step 4. Compensation: The pH is abnormal, so we know there is not complete compensation. The HCO3- is abnormal, indicating some compensation is occurring by the kidneys, so this is referred to as partial compensation.
    5. Final Interpretation: Partially Compensated Respiratory Acidosis
2. Explain the likely cause of the ABG results. The exacerbation of heart failure is likely causing fluid in his alveoli, decreasing ventilation, and causing the retention of carbon dioxide and decreased oxygenation. Dissolved carbon dioxide is an acid, so as the acid accumulates, the pH decreases, causing acidosis.
3. Create a nursing diagnosis for Mr. Smith's fluid status in PES format based on his admission data: *Excess Fluid Volume related to excessive fluid intake as evidenced by fine crackles in the bilateral lower lobes, 4+*

pitting edema, and weight gain of 15 pounds over a short period of time.

4. What is Mr. Smith's fluid balance this morning? Support your answer with data. He is demonstrating *Deficient Fluid Volume* as evidenced by the following signs and symptoms: feeling thirsty and dizzy, having low systolic blood pressure with elevated heart rate and respiratory rate, and lab work showing elevated serum sodium and BUN results.
5. What is the probable cause of his fluid balance? Excessive IV diuretics are likely causing dehydration.
6. Interpret Mr. Smith's lab results. What are the potential causes of these results? In addition to the lab results indicating fluid volume deficit explained in Answer 4, he is also demonstrating hypokalemia that is likely caused by the diuretics. His creatinine is also elevated, which could indicate hypovolemia or possible kidney injury/disease.
7. Create a nursing diagnosis statement in PES format for Mr. Smith's current fluid status: *Deficient Fluid Volume related to excess diuresis as evidenced by alteration in mental status, BP 85/45, HR 110, thirst, and sudden weight loss of 20 pounds*.
8. Create a new expected outcome in SMART format for Mr. Smith: *Mr. Smith will demonstrate fluid balance within 24 hours as evidenced by moist mucus membranes and 24-hour intake and output balance*.
9. In addition to providing intravenous fluids, what additional interventions will you implement for Mr. Smith? Additional interventions include evaluate daily weight, monitor intake and output every four hours, provide fresh water and fluids preferred by the client, administer oral potassium replacements as ordered, and monitor for signs of fluid volume excess while receiving IV fluids.
10. How will you evaluate if the nursing interventions are effective? As stated in the SMART outcome, the nurse will evaluate for moist mucus membranes and balanced intake and output in 24 hours.

Scenario B

1. What is Mr. M.'s fluid balance? Provide data supporting the imbalance. Mr. M. is exhibiting *Deficient Fluid Volume*. His blood pressure is decreased, and his heart rate is tachycardic. His serum osmolarity, hematocrit, urine specific

gravity, and BUN are elevated, which indicates that blood and urine are concentrated, a likely result of deficient fluid volume.

2. What is your interpretation of Mr. M.'s ABGs?

Step 1: pH 7.30 is below 7.35, so it is acidic and abnormal. We know this will be an acidosis.

Step 2: PaCO2 50. This is above 45, so it is acidic. The PaCO2 is moving in the opposite direction of the pH, so we know this will be respiratory in nature. This is called respiratory acidosis.

Step 3: HCO3- 24. This is a normal HCO3- level so we know the problem is not metabolic in nature. We also know the kidneys are not trying to compensate for the lung problems because the HCO3- level has not moved out of range.

Step 4: Compensation: The pH is abnormal, so there is not complete compensation. The HCO3 is normal, so the kidneys are not trying to compensate for the lungs. We call this uncompensated.

Step 5: Final Interpretation: Uncompensated Respiratory Acidosis

3. What is your interpretation of Mr. M.'s electrolyte studies?

Potassium: 5.9 – elevated, most likely due to acidosis occurring

Magnesium: 1.0 – low, most likely due to alcoholism or inadequate nutrition

Calcium: 10.2 – elevated, most likely due to acidosis occurring

Sodium: 137 – normal

4. Is Mr. M. stable or unstable? Why? Mr. M. is unstable. He is hypotensive and tachycardic. Also, his respiratory rate is low and labored, and O2 saturations are quite low. His acid-base balance is quite abnormal, which will soon lead to respiratory arrest if not promptly treated. He is developing hypovolemic shock and could experience cardiac and respiratory arrest if not treated emergently.

5. For what complications will you monitor? Mr. M. could have a respiratory arrest due to his severe acidosis, decreased level of consciousness, and respiratory distress. The elevated potassium and decreased magnesium put Mr. M. at risk for cardiac arrhythmias. His elevated calcium level could cause nausea and vomiting, which puts him at risk for aspiration with his associated lethargy.

6. Write an SBAR communication you would have with the health care provider to notify them about Mr. M.'s condition.

S: Hi, Dr. X. This is _____, a nursing student working with Mr. M. This morning Mr. M. is lethargic and having labored respirations.

B: Mr. M. was admitted during the night with pneumonia. He has a history of alcohol abuse and coronary artery disease.

A: Mr. M.'s vital signs are the following: BP 80/45, HR 110, RR 8, O2 saturation 80% on 3 L/NC. He has coarse crackles throughout his lung fields, and he is using accessory muscles to breathe. Mr. M. is lethargic and having difficulty following commands.

R: I am concerned that Mr. M.'s respiratory status is declining. I recommend increasing his oxygen and checking arterial blood gasses and electrolyte studies. I also would like you to come see Mr. M.

7. Create a NANDA-I diagnosis for Mr. M. in PES format. *Fluid Volume Deficit related to insufficient fluid intake as evidenced by BP 80/45, HR 110, and elevated serum osmolarity, hematocrit, BUN, and urine specific gravity results*.

8. Identify an expected outcome for Mr. M. in SMART format. *Mr. M. will demonstrate improving fluid balance as demonstrated by blood pressure and heart rate returning within normal range within 8 hours*.

9. What interventions will you plan for Mr. M.? Mr. M. will need either a BiPAP or intubation and mechanical ventilation for his respiratory status. He will need magnesium supplementation, and his calcium and potassium will need to be monitored closely. He may need insulin to help decrease his potassium. Any potassium contained in IV fluids should be stopped to prevent further potassium buildup. He will also need antibiotics for his pneumonia and IV fluids to treat his hypotension and tachycardia.

10. How will you evaluate if your interventions are effective? Based on the SMART goal established, the nurse will monitor Mr. M.'s blood pressure and heart rate and evaluate if they have returned to normal within eight hours. Additionally, the ABGs for Mr. M. should return to closer to normal. He will show improvement with his level of consciousness. Magnesium levels will return to normal. As Mr. M.'s pH normalizes, the calcium and potassium levels

should return to normal. Mr. M.'s fever should subside, and his vital signs should return to normal as the infection is treated and IV fluids are given.

11. Write a nursing note about Mr. M.'s condition and your actions taken. This can be in the form of a DAR, SOAP, or summary nursing note.

01/31/20xx 0900

D: On morning assessment, pt noted to be lethargic, unable to follow commands consistently, and using accessory muscles with breathing. Coarse crackles noted throughout lung fields. VS are BP 80/45, HR 110, RR 8, O2 sat 80% on 3L per nasal cannula, and temp 38.1 C.

A: Dr. X. notified and orders rec'd to increase O2 to 10L per non-rebreather mask and to check electrolytes and ABGs.

R: O2 increased and labs drawn and resulted as follows: pH 7.30, PaCO2 50, PaO2 59, HCO3 24, SaO2 80. Potassium 5.9, Magnesium 1.0, Calcium 10.2, Sodium 137. Will continue to monitor client closely and will update Dr. X. of changes.

_____,SN

Answers to interactive elements are given within the interactive element.

Chapter 16 (Elimination)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 16 Learning Activities

1. Mrs. Gonzalez should be offered therapeutic reassurance that although urinary incontinence can be the result of aging, there are interventions that can be helpful. These include pelvic muscle exercises, timed voiding to assist in regaining bladder control, avoidance of triggering agents such as caffeine, weight control, and avoidance of heavy lifting. Additional medical intervention may include biofeedback sensors, pessaries, anticholinergic medications, or surgical intervention. The client should also be educated on protective products that can help protect the skin from breakdown and assist with odor control.

Answers to interactive elements are given within the interactive element.

Chapter 17 (Grief and Loss)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 17 Learning Activities

Scenario A

1. What actions should the nurse take to support Mr. Lyn? The grieving process is variable for every individual. Mr. Lyn's outward expression of grief should be supported by the nurse. The nurse can assist Mr. Lyn to cope by using supportive presence and encouraging reminiscence by sharing good memories of his life with Mrs. Lyn. It is helpful to offer the services of the agency chaplain, as well as to offer prayer and spiritual support based on Mr. Lyn's beliefs and the nurse's comfort level. The nurse can also encourage Mr. Lyn to contact other family members and friends for additional social support.
2. What medication is helpful to administer to treat dyspnea at end of life? Opioids such as Roxanol, a highly concentrated solution of morphine, can be administered sublingually as ordered for pain and air hunger.
3. Mr. Lyn tells the nurse, "My daughter lives six hours away and would like to be here when the time comes. How much longer does she have to live?" What is the nurse's best response? Although we never know exactly when death will occur, there are recognizable signs that occur as death becomes imminent, such as noisy or irregular breathing, increased lethargy, and a type of skin discoloration called "mottling." Mrs. Lyn is demonstrating new changes in her breathing status, so death may occur in the next few days.
4. The daughter arrives and seems hesitant to talk to or touch Ms. Lyn. What tasks can the nurse coach family members to do at the end of a client's life? Nurses can encourage family members to talk with and touch their loved one. They can encourage family members to reminisce about happy stories and say, "I love you" or say "Goodbye."
5. Mrs. Lyn dies the following evening. What postmortem care should the

nurse provide? After verifying the lack of an apical heartbeat for a full minute, the nurse should follow agency policy regarding notifications and postmortem care. The nurse should document the date and time of assessment, the physician contacted, the individuals present at the time of death, the lack of response to stimuli and absence of an apical pulse, and the arrangements for transport to the morgue or funeral home. Typically, the client is bathed, dressed, and positioned to show respect and provide dignity. Cultural practices should be honored. The nurse can offer to contact other family members to inform them of the death and support families in their ways of saying goodbye.

Scenario B

1. According to Kubler-Ross' theory of grief/loss, what stage of grief is Terry currently experiencing? Terry is demonstrating the stage of denial according to Kubler-Ross' theory of grief/loss, as evidenced by his statement that he "can't believe this is happening" to him.
2. How would you explain palliative care to him? Palliative care is a way to manage your symptoms and optimize your quality of life. A team will assist you in making difficult decisions and can provide support to you and your family members
3. How would you explain advance directives to him? Advance directives are a legal way for you to establish your wishes for health care. A living will is a document that you can complete that describes your wishes if you are no longer able to speak for yourself. For example, you can decide if you would ever want a feeding tube placed if you are no longer able to eat. You can also identify a health care power of attorney who will serve as your decision maker when you can no longer speak for yourself. Would you like me to ask a social worker to visit so you can talk more about these options?
4. Identify a SMART outcome. *"Terry will discuss the meaning of the cancer diagnosis to his life before discharge."*
5. List sample nursing interventions that may help Terry to cope with this new diagnosis. Use a calm, reassuring approach. Provide an atmosphere of acceptance. Seek to understand the client's perspective. Provide Terry

realistic choices about aspects of his care when possible. Encourage verbalization of feelings, perceptions, and fears. Encourage support from family and friends.

Answers to interactive elements are given within the interactive element.

Chapter 18 (Spirituality)

OPEN RESOURCES FOR NURSING (OPEN RN)

Answer Key to Chapter 18 Learning Activities

1. These questions can be asked to gain insight into the client's personal spiritual beliefs:

F–Faith or beliefs: What are your spiritual beliefs? Do you consider yourself spiritual? What things do you believe in that give meaning to life?

I–Importance and influence: Is faith/spirituality important to you? How has your illness and/or hospitalization affected your personal practices /beliefs?

C–Community: Are you connected with a faith center in the community? Does it provide support/comfort for you during times of stress? Is there a person/group/leader who supports/assists you in your spirituality?

A–Address: What can we do to help support your spiritual beliefs/practices?

Answers to interactive elements are given within the interactive element.

Chapter 19 (Care of the Older Adult)

Answer Key to Chapter 19 Learning Activities

The SPICES tool can assess many common problems for aging adults.

S: Sleep Disorders

Examples of questions might include the following:

What length of rest periods do you have during the night? Do you rise frequently? How many times per night? Do you nap during the day? Where do you sleep?

P: Problems with Eating or Feeding

Examples of questions might include the following:

Do you notice difficulty swallowing foods or beverages? Do you choke after swallowing? Do you ever experience a sensation of food being caught in the throat?

I: Incontinence

Examples of questions might include the following:

Do you experience frequent urination? Do you feel a sense of urgency or that you will not reach the bathroom in time to void? Do you feel that you are able to empty your bladder completely?

C: Confusion

Examples of questions might include the following:

What is your name? Where are you right now? Who is the President? Do you ever experience difficulty remembering why you entered a certain room? Do you find yourself forgetting things or people you previously knew? Do your loved ones report that you have memory issues?

E: Evidence of Falls

Examples of questions might include the following:

Have you experienced a recent fall? What are the bruises on your arms or legs attributed to? Do you feel unsteady or stumble when first arising out of bed?

S: Skin Breakdown

Examples of questions might include the following:

Do you have any open areas on your skin? Do you have areas of redness that do not go away? Are you able to reposition yourself frequently or do you rely on the assistance of others?

Answers to interactive elements are given within the interactive element.

Appendix A: Sample NANDA-I Diagnoses

OPEN RESOURCES FOR NURSING (OPEN RN)

Table A contains selected, commonly used NANDA-I 2021-2023 nursing diagnoses related to concepts discussed in this book. Nursing students may use Gordon's Functional Health Patterns framework to cluster assessment data by domain and then select appropriate NANDA-I nursing diagnoses based on the client's defining characteristics. For more information, refer to a current nursing care planning resource.

Table A Sample 2021-2023 NANDA-I Diagnoses by Domain[1]

1. Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses: Definitions and classification 2021-2023, Twelfth Edition*. Thieme Publishers New York.

Domain	Class & Nursing Diagnosis
Health Promotion	• Frail elderly syndrome • Ineffective health maintenance behaviors • Readiness for enhanced health self-management
Nutrition	• Imbalanced nutrition: less than body requirements • Readiness for enhanced nutrition • Impaired swallowing • Risk for unstable blood glucose level • Risk for electrolyte imbalance • Deficient fluid volume • Excess fluid volume • Risk for imbalanced fluid volume

Elimination and Exchange	Urinary function • Impaired urinary elimination • Stress urinary incontinence • Urge urinary incontinence • Urinary retention • Risk for urinary retention Gastrointestinal function • Constipation • Risk for constipation • Diarrhea • Impaired bowel continence Respiratory function • Impaired gas exchange

Activity/Rest	Sleep/Rest • Insomnia • Disturbed sleep pattern • Readiness for enhanced sleep Activity/Rest • Decreased activity tolerance • Risk for disuse syndrome • Impaired bed mobility • Impaired physical mobility • Impaired wheelchair mobility • Impaired sitting • Impaired standing • Impaired transfer ability • Impaired walking Energy balance • Fatigue • Wandering Cardiovascular/Pulmonary responses • Ineffective breathing pattern • Decreased cardiac output • Risk for decreased cardiac output • Risk for unstable blood pressure • Risk for thrombosis • Ineffective peripheral tissue perfusion Self-care • Bathing self-care deficit • Dressing self-care deficit • Feeding self-care deficit

	• Toileting self-care deficit
Perception/ Cognition	• Unilateral neglect • Acute confusion • Chronic confusion • Deficient knowledge • Readiness for enhanced knowledge • Impaired memory • Readiness for enhanced communication • Impaired verbal communication

Self-Perception	• Hopelessness • Readiness for enhanced hope • Disturbed body image
Role Relationship	• Caregiver role strain • Risk for caregiver role strain • Impaired social interaction
Sexuality	• Sexual dysfunction
Coping/Stress Tolerance	• Risk for relocation stress syndrome • Anxiety • Ineffective coping • Death anxiety • Fear • Maladaptive grieving • Powerlessness • Risk for autonomic dysreflexia

Life Principles	• Readiness for enhanced spiritual well-being • Decisional conflict • Spiritual distress
Safety/Protection	• Risk for infection • Ineffective airway clearance • Risk for aspiration • Risk for bleeding • Risk for adult falls • Risk for injury • Impaired dentition • Adult pressure injury • Risk for adult pressure injury • Impaired skin integrity • Impaired tissue integrity • Risk for suicidal behavior • Risk for poisoning • Risk for allergy reaction • Hyperthermia • Hypothermia
Comfort	• Impaired comfort • Nausea • Acute pain • Chronic pain • Risk for loneliness

Growth/ Development	• Delayed child development

Appendix B: Template for Creating a Nursing Care Plan

OPEN RESOURCES FOR NURSING (OPEN RN)

View a sample Nursing Care Plan Template.

Appendix C: Sample Abbreviated Care Plan for Scenario C

OPEN RESOURCES FOR NURSING (OPEN RN)

Sample Abbreviated Care Plan for Scenario C in Chapter 4.3.

- Use the following to access a sample care plan for Scenario C: Sample Care Plan.

Appendix D: Master Glossary

A

Active assist range-of-motion exercise: A client's joint receiving partial assistance in movement from an outside force. (Chapter 13.2)

Active range-of-motion exercise: Movement of a joint by the individual performing the exercise. (Chapter 13.2)

Active transport: Movement of solutes and ions across a cell membrane against a concentration gradient from an area of lower concentration to an area of higher concentration using energy during the process. (Chapter 15.2)

Acute grief: Grief that begins immediately after the death of a loved one and includes the separation response and response to stress. (Chapter 17.2)

Acute pain: Pain that is limited in duration and is associated with a specific cause. (Chapter 11.2)

Acute, self-limiting infections: Infections that develop rapidly and generally last only 10-14 days. Colds, ear infections, and coughs are considered acute, self-limiting infections. (Chapter 9.4)

Addiction: A chronic disease of the brain's reward, motivation, memory, and related circuitry reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors. Addiction is characterized by several symptoms, such as the inability to consistently abstain from a substance, impaired behavioral control, cravings, diminished recognition of significant problems with one's behaviors and interpersonal relationships, and a dysfunctional emotional response. (Chapter 11.2)

Adjuvant: Medication that is not classified as an analgesic but has been found in clinical practice to have either an independent analgesic effect or additive analgesic properties when administered with opioids. (Chapter 11.4)

Adult day centers: Care that offers people with dementia and other chronic illnesses the opportunity to be social and to participate in activities in a safe environment, while also giving their caregivers the opportunity to work, run errands, or take a much-needed break. (Chapter 6.3)

Advance directives: Legal documents that direct care when the client can no longer speak from themselves, including the living will and the health care power of attorney. (Chapter 17.2)

Advanced Practice Registered Nurse (APRN): An RN who has a graduate degree and advanced knowledge. There are four categories of APRNs: certified nurse-midwife (CNM), clinical nurse specialist (CNS), certified nurse practitioner (CNP), or certified registered nurse anesthetist (CRNA). These nurses can diagnose illnesses and prescribe treatments and medications. (Chapter 1.4)

Ageism: The stereotyping and discrimination against individuals or groups on the basis of their age. Ageism can take many forms, including prejudicial attitudes, discriminatory practices, or institutional policies and practices that perpetuate stereotypical beliefs. (Chapter 6.4, Chapter 19.2)

Alzheimer's disease: An irreversible, progressive brain disorder that slowly destroys memory and thinking skills and eventually the ability to carry out the simplest tasks. (Chapter 6.3)

Ambulation: The ability of a client to safely walk independently, with assistance from another person, or with an assistive device, such as a cane, walker, or crutches. (Chapter 13.2)

Analgesics: Medications used to relieve pain. (Chapter 11.4)

ANA Standards of Professional Nursing Practice: Authoritative statements of the duties that all registered nurses, regardless of role, population, or specialty, are expected to perform competently. The Standards of Professional Nursing Practice describe a competent level of nursing practice as demonstrated by the critical thinking model known as the nursing process. The nursing process includes the components of assessment, diagnosis, outcomes identification, planning, implementation, and evaluation. (Chapter 1.3)

ANA Standards of Professional Performance: Standards that describe a competent level of behavior in the professional role of the nurse, including

activities related to ethics, advocacy, respectful and equitable practice, communication, collaboration, leadership, education, scholarly inquiry, quality of practice, professional practice evaluation, resource stewardship, and environmental health. (Chapter 1.3)

Angiogenesis: The process of wound healing when new capillaries begin to develop within the wound 24 hours after injury to bring in more oxygen and nutrients for healing. (Chapter 10.3)

Anorexia: Loss of appetite or loss of desire to eat. (Chapter 17.4)

Antibodies: Y proteins created by B cells that are specific to each pathogen and lock onto its surface and mark it for destruction by other immune cells. The five classes of antibodies are IgG, IgM, IgA, IgD, and IgE. (Chapter 9.3)

Anticipatory grief: Grief before a loss, associated with diagnosis of an acute, chronic, and/or terminal illness experienced by the client, family, and caregivers. Examples of anticipatory grief include actual or fear of potential loss or health, independence, body part, financial stability, choice, or mental function. (Chapter 17.2)

Anuria: Absence of urine output that is typically found during kidney failure. Can be defined as less than 50 mL of urine over a 24-hour period. (Chapter 16.2)

Aphasia: A communication disorder that results from damage to portions of the brain that are responsible for language. (Chapter 2.3)

Apnea: Temporary cessation of breathing. When apnea occurs during sleep, it is often caused by the condition called Obstructive Sleep Apnea (OSA). (Chapter 8.2)

Approximated edges: The well-closed edges of a wound healing by primary intention. (Chapter 10.3)

Arterial Blood Gas (ABG): Diagnostic test performed on an arterial sample of blood to determine its pH level, oxygenation status, and carbon dioxide status. (Chapter 8.2)

Arterial insufficiency: A condition caused by lack of adequately oxygenated blood supply to specific tissues. (Chapter 10.2)

Art of nursing: Unconditional acceptance of the humanity of others, respecting their need for dignity and worth, while providing compassionate, comforting care. (Chapter 4.2)

Aseptic technique: The purposeful reduction of pathogens to prevent the transfer of microorganisms from one person or object to another during a medical procedure. For example, a nurse administering parenteral medication or performing urinary catheterization uses aseptic technique. When performed properly, aseptic technique prevents contamination and transfer of pathogens to the client from caregiver hands, surfaces, and equipment during routine care or procedures. (Chapter 9.6)

Assertive communication: A way to convey information that describes the facts, the sender's feelings, and explanations without disrespecting the receiver's feelings. This communication is often described as using "I" messages: "I feel...," "I understand...," or "Help me to understand..." (Chapter 2.2)

Assimilation: The process of adopting or conforming to the practices, habits, and norms of a cultural group. As a result, the person gradually takes on a new cultural identity and may lose their original identity in the process. (Chapter 3.2)

Assistive device: An object or piece of equipment designed to help a client with activities of daily living, such as a walker, cane, gait belt, or mechanical lift. (Chapter 13.2)

Associated conditions: Medical diagnoses, injuries, procedures, medical devices, or pharmacological agents. These conditions are not independently modifiable by the nurse, but support accuracy in nursing diagnosis. (Chapter 4.4)

At-risk behavior: According to the Just Culture model, an error that occurs when a behavioral choice is made that increases risk where risk is not recognized or is mistakenly believed to be justified. (Chapter 5.4)

At-risk populations: Groups of people who share a characteristic that causes each member to be susceptible to a particular human response, such as demographics, health/family history, stages of growth/development, or exposure to certain events/experiences. (Chapter 4.4)

B

Bacteremia: The presence of bacteria in blood. (Chapter 9.4)

Barrel chest: An increased anterior-posterior chest diameter, resulting from air trapping in the alveoli, that occurs in chronic respiratory disease. (Chapter 8.3)

Basic nursing care: Care that can be performed following a defined nursing procedure with minimal modification in which the responses of the client to the nursing care are predictable. (Chapter 1.4)

B cells: Immune cells that mature in the bone marrow. B cells make Y-shaped proteins called antibodies that are specific to each pathogen and lock onto its surface and mark it for destruction by other immune cells. (Chapter 9.3)

Bed mobility: The ability of a client to move around in bed, including moving from lying to sitting and sitting to lying. (Chapter 13.2)

Bedside handoff report: A handoff report in hospitals that involves clients, their family members, and both the off-going and the incoming nurses. The report is performed face to face and conducted at the client's bedside. (Chapter 2.4)

Behavioral restraints: Restraints used to manage violent, self-destructive behaviors such as hitting or kicking staff or other clients, physically harming themselves or others, or threatening to do so. Behavioral restraints are used in emergency situations where safety concerns need to be immediately addressed to prevent harm. (Chapter 5.7)

Bereavement period: The time it takes for the mourner to feel the pain of the loss, mourn, grieve, and adjust to the world without the presence of the deceased. (Chapter 17.2)

Bias: To carry an attitude, opinion, or inclination (positive or negative) towards a group or members of a group. Bias can be a conscious attitude (explicit), or a person may not be aware of their bias (implicit). (Chapter 3.2)

Black stools: Black-colored stools can be caused by iron supplements or bismuth subsalicylate (Pepto-Bismol) taken for an upset stomach. (Chapter 16.2)

Board of Nursing: The state-specific licensing and regulatory body that sets the standards for safe nursing care, decides the scope of practice for nurses within its jurisdiction, and issues licenses to qualified candidates. (Chapter 1.3)

Body Mass Index (BMI): A measure of weight categories including underweight, normal weight, overweight, and obese taking height and weight into consideration. (Chapter 14.3)

Body mechanics: The coordinated effort of muscles, bones, and the nervous system to maintain balance, posture, and alignment during moving, transferring, and repositioning clients. (Chapter 13.2)

Bowel incontinence: The loss of bowel control, causing the unexpected passage of stool. (Chapter 16.8)

Bowel retraining: Involves teaching the body to have a bowel movement at a certain time of the day. (Chapter 16.8)

Braden Scale: A standardized assessment tool used to assess and document a client's risk factors for developing pressure injuries. (Chapter 10.5)

Bradypnea: Decreased respiratory rate less than the normal range according to the client's age. (Chapter 8.3)

Broca's aphasia: A type of aphasia where clients understand speech and know what they want to say, but frequently speak in short phrases that are produced with great effort. People with Broca's aphasia typically understand the speech of others fairly well. Because of this, they are often aware of their difficulties and can become easily frustrated. (Chapter 2.3)

Burnout: A caregiver's diminished caring and cynicism that can be triggered by workplace demands, lack of resources to do work professionally and safely, interpersonal relationship stressors, or work policies that can lead to diminished caring and cynicism. Burnout may be manifested physically and psychologically with a loss of motivation. (Chapter 17.2)

C

Cachexia: Wasting of muscle and adipose tissue due to lack of nutrition. (Chapter 17.4)

Calorie-dense foods: Foods with a substantial number of calories and few nutrients. (Chapter 14.2)

Carbohydrates: Sugars and starches that provide an important energy source, providing 4 kcal/g of energy. (Chapter 14.2)

Cardiac output: The amount of blood the heart pumps in one minute. (Chapter 8.2)

Cardiopulmonary Resuscitation (CPR): Emergency treatment initiated when a client's breathing stops or their heart stops beating. It may involve chest compressions and mouth-to-mouth breathing, electric shocks to restart the heart, breathing tubes to open the airway, or cardiac medications. (Chapter 17.2)

Care relationship: A relationship described as one in which the whole person is assessed while balancing the vulnerability and dignity of the client and family. (Chapter 4.2)

Cataracts: Opacity of the lens of the eye that causes clouded, blurred, or dim vision. Cataracts can be removed with surgery that replaces the lens with an artificial lens. (Chapter 7.2)

Chain of command: A hierarchy of reporting relationships in an agency that establishes accountability and lays out lines of authority and decision-making power. (Chapter 1.4)

Chaplains: Trained professionals in hospitals, nursing homes, assisted living facilities, and hospices that assist with the spiritual, religious, and emotional needs of clients, families, and staff. Chaplains support and encourage people of all religious faiths and cultures and customize their approach to each individual's background, age, and medical condition. (Chapter 18.2)

Charting by exception (CBE): A type of documentation where a list of "normal findings" is provided and nurses document assessment findings by confirming normal findings and writing brief documentation notes for any abnormal findings. (Chapter 2.5)

Chemical digestion: Breakdown of food with stomach acids, bile, and pancreatic enzymes for nutrient release. (Chapter 14.2)

Chemical restraint: A drug used to manage a client's behavior, restrict the client's freedom of movement, or impair the clients ability to appropriately

interact with their surroundings that is not a standard treatment or dosage for the client's condition. (Chapter 5.7)

Chronic infections: Infections that may persist for months. Hepatitis and mononucleosis are examples of chronic infections. (Chapter 9.4)

Chronic pain: Pain that is ongoing and persistent for longer than six months. (Chapter 11.2)

Chvostek's sign: An assessment sign of acute hypocalcemia characterized by involuntary facial muscle twitching when the facial nerve is tapped. (Chapter 15.4)

Circadian rhythms: Body rhythms that direct a wide variety of functions, including wakefulness, body temperature, metabolism, and the release of hormones. They control the timing of sleep, causing individuals to feel sleepy at night and creating a tendency to wake in the morning without an alarm. (Chapter 12.2)

Client: Individual, family, or group, which includes significant others and populations. (Chapter 4.2)

Clinical judgment: The observed outcome of critical thinking and decision-making. It is an iterative process that uses nursing knowledge to observe and access presenting situations, identify a prioritized client concern, and generate the best possible evidence-based solutions to deliver safe client care. (Chapter 4.2)

Clinical reasoning: A complex cognitive process that uses formal and informal thinking strategies to gather and analyze client information, evaluate the significance of this information, and weigh alternative actions. (Chapter 4.2)

Clubbing: Enlargement of the fingertips that occurs with chronic hypoxia. (Chapter 8.3)

Clustering data: Grouping data into similar domains or patterns. (Chapter 4.4)

Code of ethics: A code that applies normative, moral guidance for nurses in terms of what they ought to do, be, and seek. A code of ethics makes the primary obligations, values, and ideals of a profession explicit. (Chapter 1.6)

Cognition: A term used to describe our ability to think. (Chapter 6.1)

Cognitive impairment: Impairment in mental processes that drive how an

individual understands and acts in the world, affecting the acquisition of information and knowledge. (Chapter 6.2)

Collaborative nursing interventions: Nursing interventions that require cooperation among health care professionals and unlicensed assistive personnel (UAP). (Chapter 4.6)

Colostrum: A thick yellowish-white fluid rich in proteins and immunoglobulin A (IgA) and lower in carbohydrates and fat than mature breast milk secreted within the first 2-3 days after giving birth. (Chapter 14.3)

Comfort care: Care that occurs when the client's and medical team's goals shift from curative interventions to symptom control, pain relief, and quality of life. (Chapter 17.2)

Compassion fatigue: A state of chronic and continuous self-sacrifice and/or prolonged exposure to difficult situations that affect a health care professional's physical, emotional, and spiritual well-being. (Chapter 17.2)

Complete proteins: Proteins with enough amino acids in enough quantities to perform necessary functions such as growth and tissue maintenance. These must be ingested in the diet. (Chapter 14.2)

Complex carbohydrates: Larger molecules of polysaccharides that break down more slowly and release sugar into the bloodstream more slowly than simple carbohydrates. (Chapter 14.2)

Complicated grief: Chronic grief, delayed grief, exaggerated grief, and masked grief are types of complicated grief. (Chapter 17.2)

Constipation: Infrequent or difficult evacuation of feces. (Chapter 16.6)

Contrast: A special dye administered to clients before some diagnostic tests so that certain areas show up better on the X-rays. (Chapter 16.9)

Coordination of care: While implementing interventions during the nursing process, includes components such as organizing the components of the plan with input from the health care consumer, engaging the client in self-care to achieve goals, and advocating for the delivery of dignified and person-centered care by the interprofessional team. (Chapter 4.7)

Coughing and deep breathing: A breathing technique where the client is encouraged to take deep, slow breaths and then exhale slowly. After each set of breaths, the client should cough. This technique is repeated 3 to 5 times every hour. (Chapter 8.2)

Critical thinking: Reasoning about clinical issues such as teamwork, collaboration, and streamlining workflow. (Chapter 4.2)

Cues: Subjective or objective data that gives the nurse a hint or indication of a potential problem, process, or disorder. (Chapter 4.2)

Cultural awareness: A deliberate, cognitive process in which health care providers become appreciative and sensitive to the values, beliefs, lifeways, practices, and problem-solving strategies of a client's culture. Cultural awareness goes beyond a simple awareness of the existence of other cultures and involves an interest, curiosity, and appreciation of other cultures. (Chapter 3.4)

Cultural competence: The process of applying evidence-based nursing in agreement with the preferred cultural values, beliefs, worldview, and practices of clients to produce improved client outcomes. (Chapter 3.1, Chapter 3.4)

Cultural congruent practice: Nursing care that is in agreement with the preferred values, beliefs, worldview, and practices of the health care consumer. (Chapter 3.4)

Cultural desire: Refers to the intrinsic motivation and commitment on the part of a nurse to develop cultural awareness and cultural competency. (Chapter 3.4)

Cultural diversity: Cultural differences in people. (Chapter 3.2)

Cultural encounter: A process where the nurse directly engages in face-to-face cultural interactions and other types of encounters with clients from culturally diverse backgrounds to modify existing beliefs about a cultural group and to prevent possible stereotyping. (Chapter 3.4)

Cultural humility: A humble and respectful attitude toward individuals of other cultures that pushes one to challenge their own cultural biases, realize they cannot know everything about other cultures, and approach learning about other cultures as a lifelong goal and process. (Chapter 3.1, Chapter 3.2)

Cultural knowledge: Seeking information about cultural health beliefs and values to understand clients' world views. (Chapter 3.4)

Culturally responsive care: Nursing actions that integrate a person's cultural beliefs into their care. (Chapter 3.1)

Culturally safe environment: A safe space for clients to interact with health

professionals, without judgment or discrimination, where the client is free to express their cultural beliefs, values, and identity. (Chapter 3.8)

Cultural negotiation: A process where the client and nurse seek a mutually acceptable way to deal with competing interests of nursing care, prescribed medical care, and the client's cultural needs. Cultural negotiation is reciprocal and collaborative. When the client's cultural needs do not significantly or adversely affect their treatment plan, the cultural needs can be accommodated. (Chapter 3.8)

Cultural sensitivity: Being tolerant and accepting of cultural practices and beliefs of people. (Chapter 3.4)

Cultural skill: The ability to gather and synthesize relevant cultural information about their clients while planning care and using culturally sensitive communication skills while doing so. (Chapter 3.4)

Culture: A set of beliefs, attitudes, and practices shared by a group of people or community that is accepted, followed, and passed down to other members of the group. (Chapter 3.2)

Culture of safety: The behaviors, beliefs, and values within and across all levels of an organization as they relate to safety and clinical excellence, with a focus on people. (Chapter 5.4)

Cyanosis: Bluish discoloration of the skin and mucous membranes. (Chapter 8.2)

Cytokines: Plasma proteins that communicate with other body organs and cells in the body to respond to and initiate inflammation. (Chapter 9.3)

Cytokine storm: A severe immune reaction in which the body releases too many cytokines into the blood too quickly. A cytokine storm can occur as a result of an infection, autoimmune condition, or other disease. Signs and symptoms include high fever, inflammation, severe fatigue, and nausea. A cytokine storm can be severe or life-threatening and lead to multiple organ failure. (Chapter 9.3)

D

DAR: A type of documentation often used in combination with charting by exception. DAR stands for Data, Action, and Response. Focused DAR notes are brief, and each note is focused on one client problem for efficiency in documenting, as well as for reading. (Chapter 2.5)

Deductive reasoning: "Top-down thinking" or moving from the general to the specific. Deductive reasoning relies on a general statement or hypothesis—sometimes called a premise or standard—that is held to be true. The premise is used to reach a specific, logical conclusion. (Chapter 4.2)

Deep tissue pressure injuries: Persistent; non-blanchable; deep red, maroon, or purple discoloration of intact or nonintact skin revealing a dark wound bed or blood-filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. (Chapter 10.4)

Defining characteristics: Observable cues/inferences that cluster as manifestations of a problem-focused, health-promotion diagnosis, or syndrome. This does not only imply those things that the nurse can see, but also things that are seen, heard (e.g., the client/family tells us), touched, or smelled. (Chapter 4.4)

Dehiscence: The separation of a surgical incision. (Chapter 10.2)

Delegation: The assignment of the performance of activities or tasks related to client care to unlicensed assistive personnel while retaining accountability for the outcome. (Chapter 4.7)

Delirium: An acute state of cognitive impairment that typically occurs suddenly due to a physiological cause, such as infection, hypoxia, electrolyte imbalances, drug effects, or other acute brain injury. (Chapter 6.2)

Dementia: A chronic condition of impaired cognition, caused by brain disease or injury, marked by personality changes, memory deficits, and impaired reasoning. Dementia can be caused by a group of conditions, such as Alzheimer's disease, vascular dementia, frontal-temporal dementia, and Lewy body disease. It is gradual, progressive, and irreversible. (Chapter 6.2)

Dependent nursing interventions: Interventions that require a prescription

from a physician, advanced practice nurse, or physician's assistant. (Chapter 4.6)

Depression: A brain disorder with a variety of causes, including genetic, biological, environmental, and psychological factors. (Chapter 6.2)

Dermis: The layer of skin underneath under the epidermis, containing hair follicles, sebaceous glands, blood vessels, endocrine sweat glands, and nerve endings. (Chapter 10.2)

Development: Biological changes, as well as social and cognitive changes, that occur continuously throughout our lives. (Chapter 6.2)

Diabetic retinopathy: A complication of diabetes mellitus due to damaged blood vessels in the retina. If found early, treatments, such as laser treatment that can help shrink blood vessels, injections that can reduce swelling, or surgery, can prevent permanent vision loss. (Chapter 7.2)

Diarrhea: More than three unformed stools in 24 hours. (Chapter 16.7)

Dietary Reference Intakes (DRIs): Set requirements or limit amounts of a certain nutrient, including proteins, carbohydrates, fats, vitamins, minerals, and fiber. (Chapter 14.2)

Diffusion: The movement of solute particles from an area of higher concentration to an area of lower concentration. (Chapter 15.2)

Direct care: Interventions that are carried out by having personal contact with a client. (Chapter 4.6)

Discrimination: Unfair and different treatment of another person or group, denying them opportunities and rights to participate fully in society. (Chapter 3.2)

Disease: Infections can lead to disease that causes signs and symptoms resulting in a deviation from the normal structure or functioning of the host. (Chapter 9.4)

Disenfranchised grief: Any loss that is not validated or recognized. (Chapter 17.2)

Disinfection: Removal of organisms from inanimate objects and surfaces. However, disinfection does not typically destroy all spores and viruses. (Chapter 9.6)

Do-Not-Resuscitate (DNR) order: A medical order that instructs health care

professionals not to perform cardiopulmonary resuscitation (CPR) if a client's breathing stops or if the client's heart stops beating. (Chapter 17.2)

Dysphagia: Impaired swallowing. (Chapter 1.4, Chapter 14.2)

Dyspnea: A subjective feeling of not getting enough air. Depending on severity, dyspnea causes increased levels of anxiety. (Chapter 8.2)

Dysuria: Painful or difficult urination. (Chapter 16.2)

E

Edema: Swelling caused by excessive interstitial fluid retention. (Chapter 15.2)

Electronic Health Record (EHR): A digital version of a client's paper chart. EHRs are real-time, client-centered records that make information available instantly and securely to authorized users. (Chapter 2.5)

Electronic Medical Record (EMR): An electronic version of the client's medical record. (Chapter 4.3)

Endotracheal Tube (ET tube): An ET tube is inserted by an advanced practitioner to maintain a secure airway when a client is experiencing respiratory failure or is receiving general anesthesia. (Chapter 8.2)

Enteral nutrition: Liquid nutrition given through the gastrointestinal tract via a tube while bypassing chewing and swallowing. (Chapter 14.3)

Enuresis: Incontinence when sleeping (i.e., bedwetting). (Chapter 16.2)

Epidermis: The very thin, top layer of the skin that contains openings of the sweat gland ducts and the visible part of hair known as the hair shaft. (Chapter 10.2)

Epithelialization: The development of new epidermis and granulation tissue in a healing wound. (Chapter 10.3)

Eschar: Dark brown/black, dry, thick, and leathery dead tissue in wounds. (Chapter 10.4)

Essential nutrients: Nutrients that must be ingested from dietary intake. Essential nutrients cannot be synthesized by the body. (Chapter 14.2)

Ethical principle: An ethical principle is a general guide, basic truth, or assumption that can be used with clinical judgment to determine a course of

action. Four common ethical principles are beneficence (do good), nonmaleficence (do no harm), autonomy (control by the individual), and justice (fairness). (Chapter 1.6)

Ethnocentrism: The belief that one's culture (or race, ethnicity, or country) is better and preferable than another's. (Chapter 3.2)

Evidence-Based Practice (EBP): A lifelong problem-solving approach that integrates the best evidence from well-designed research studies and evidence-based theories; clinical expertise and evidence from assessment of the health consumer's history and condition, as well as health care resources; and client, family, group, community, and population preferences and values. (Chapter 1.8, Chapter 4.2)

Excoriation: Redness and removal of the surface of the topmost layer of skin, often due to maceration or itching. (Chapter 10.2)

Expected outcomes: Statements of measurable action for the client within a specific time frame and in response to nursing interventions. "SMART" outcome statements are specific, measurable, action-oriented, realistic, and include a time frame. (Chapter 4.5)

Exposure: An encounter with a potential pathogen. (Chapter 9.4)

Expressive aphasia: The impaired ability to form words and speak. (Chapter 1.4, Chapter 2.3)

Extracellular fluids (ECF): Fluids found outside cells in the intravascular or interstitial spaces. (Chapter 15.2)

F

Fading away: A transition that families make when they realize their seriously ill family member is dying. (Chapter 17.2)

Fats: Fatty acids and glycerol that are essential for tissue growth, insulation, energy source, energy storage, and hormone production. Fats provide 9 kcal/g of energy. (Chapter 14.2)

Fat-soluble vitamins: Vitamins that dissolve in fats and oils and are stored

in fat tissue and can build up in the liver, resulting in toxicity. Fat-soluble vitamins include vitamins A, D, E, and K. (Chapter 14.2)

Fecal impaction: A condition that occurs when stool accumulates in the rectum usually due to the client not feeling the presence of stool or not using the toilet when the urge is felt. Large balls of soft stool may need to be digitally removed or treated with mineral oil enemas. (Chapter 16.6)

Filtration: Movement of fluids through a permeable membrane utilizing hydrostatic pressure. (Chapter 15.2)

Fowler's positioning: A position where the client is supine with the head of bed placed at a 45- to 90-degree angle. The bed can be used to slightly flex the hips to help prevent the client from migrating downwards in bed. (Chapter 13.2)

Frequency: Urinary frequency is the need to urinate many times during the day or at night (nocturia) in normal or less-than-normal volumes. It may be accompanied by a feeling of urgency. (Chapter 16.2)

Friction: The rubbing of skin against a hard object, such as the bed or the arm of a wheelchair. This rubbing causes heat that can remove the top layer of skin and often results in skin damage. (Chapter 10.4)

Functional Health Patterns: An evidence-based assessment framework for identifying client problems and risks during the assessment phase of the nursing process. (Chapter 4.4)

Functional incontinence: Occurs in older adults who have normal bladder control but have a problem getting to the toilet because of arthritis or other disorders that make it hard to move quickly. Clients with dementia also have increased risk for functional incontinence. (Chapter 16.4)

Functional mobility: The ability of a person to move around in their environment, including walking, standing up from a chair, sitting down from standing, and moving around in bed. (Chapter 13.2)

G

Gait belt: A 2-inch-wide (5 mm) belt, with or without handles, that is fastened

around a client's waist used to ensure stability when assisting clients to stand, ambulate, or to transfer from bed to chair. (Chapter 13.2)

Gas exchange: Refers to the exchange of oxygen and carbon dioxide in the alveoli and the pulmonary capillaries; also called respiration. (Chapter 8.2)

Gender expression: A person's outward demonstration of gender in relation to societal norms, such as in style of dress, hairstyle, or other mannerisms. (Chapter 3.2)

Gender identity: A person's inner sensibility that they are a man, a woman, or perhaps neither. (Chapter 3.2)

Generalization: A judgment formed from a set of facts, cues, and observations. (Chapter 4.2)

Gerontology: The study of the social, cultural, psychological, cognitive, and biological aspects of aging. (Chapter 19.2)

Glaucoma: Gradual loss of peripheral vision caused by elevated intraocular pressure that leads to progressive damage to the optic nerve. (Chapter 7.2)

Global aphasia: A type of aphasia that results from damage to extensive portions of the language areas of the brain. Individuals with global aphasia have severe communication difficulties and may be extremely limited in their ability to speak or comprehend language. They may be unable to say even a few words or may repeat the same words or phrases over and over again. They may have trouble understanding even simple words and sentences. (Chapter 2.3)

Glycemic index: A measure of how quickly plasma glucose levels are released into the bloodstream after carbohydrates are consumed. (Chapter 14.2)

Goals: Broad statements of purpose that describe the aim of nursing care. (Chapter 4.5)

Granulation tissue: New connective tissue in a healing wound with new, fragile, thin-walled capillaries. (Chapter 10.3)

Grief: The emotional response to a loss, defined as the individualized and personalized feelings and responses that an individual makes to real, perceived, or anticipated loss. (Chapter 17.2)

Growth: Physical changes that occur during the development of an individual beginning at the time of conception. (Chapter 6.2)

H

Handoff report: A process of exchanging vital client information, responsibility, and accountability between the off-going and incoming nurses in an effort to ensure safe continuity of care and the delivery of best clinical practices. (Chapter 2.4, Chapter 5.3)

HCO3: Bicarbonate level of arterial blood indicated in an arterial blood gas (ABG) result. Normal range is 22-26. (Chapter 8.2)

Healthcare-Associated Infection (HAI): An infection that is contracted in a health care facility or under medical care. (Chapter 9.4)

Health care power of attorney: A legal document that identifies a trusted individual to serve as a decision maker for health issues when the client is no longer able to speak for themselves. (Chapter 17.2)

Health disparities: Differences in health outcomes resulting from entrenched economic, sociopolitical, or environmental disadvantages. Health disparities negatively impact groups of people based on their ethnicity, gender, age, mental health, disability, sexual orientation or gender identity, socioeconomic status, geographic location, or other characteristics historically linked to discrimination or exclusion. (Chapter 3.5)

Health teaching and health promotion: Employing strategies to teach and promote health and wellness. (Chapter 4.7)

Health promotion-wellness nursing diagnosis: A clinical judgment concerning motivation and desire to increase well-being and to actualize human health potential. (Chapter 4.4)

Healthy environment: A place of physical, mental, and social well-being supporting optimal health and safety. (Chapter 5.9)

Hematuria: Blood in urine, either visualized or found during microscopic analysis. (Chapter 16.2)

Hemostasis phase of wound healing: The first stage of wound healing

when clotting factors are released to form clots to stop the bleeding. (Chapter 10.3)

Holism: Treatment of the whole person, including physical, mental, spiritual, and social needs. (Chapter 3.1)

Hospice care: Care that focuses on providing comfort and dignity at the end of life. It involves care and support services that can be of great benefit to people in the final stages of dementia and to their families. (Chapter 6.3, Chapter 17.2)

Huffing technique: A technique helpful for clients who have difficulty coughing. Teach the client to inhale with a medium-sized breath and then make a sound like "ha" to push the air out quickly with the mouth slightly open. (Chapter 8.2)

Human factors: A science that focuses on the interrelationships between humans, the tools and equipment they use in the workplace, and the environment in which they work. (Chapter 5.2)

Hydrostatic pressure: The pressure that a contained fluid exerts on what is confining it. (Chapter 15.2)

Hypercapnia: Elevated levels of retained carbon dioxide in the body. (Chapter 8.2, Chapter 15.5)

Hypertonic solution: Intravenous fluids with a higher concentration of dissolved particles than blood plasma. (Chapter 15.3)

Hypervolemia: Excess intravascular fluid. Used interchangeably with "excessive fluid volume." (Chapter 15.3)

Hypodermis: The bottom layer of skin, also referred to as the subcutaneous layer, consisting mainly of adipose tissue or fat, along with some blood vessels and nerve endings. Beneath this layer lies muscles, tendons, ligaments, and bones. (Chapter 10.2)

Hypotonic solution: Intravenous fluids with a lower concentration of dissolved particles than blood plasma. (Chapter 15.3)

Hypovolemia: Intravascular fluid loss. Used interchangeably with "deficient fluid volume" and "dehydration." (Chapter 15.2)

Hypoxemia: A specific type of hypoxia that is defined as decreased partial pressure of oxygen in the blood (PaO2) indicated in an arterial blood gas (ABG) result. (Chapter 8.2)

Hypoxia: A reduced level of tissue oxygenation. Hypoxia has many causes, ranging from respiratory and cardiac conditions to anemia. (Chapter 8.2)

I

Impaired skin integrity: Altered epidermis and/or dermis. (Chapter 10.2)

Impaired tissue integrity: Damage to deeper layers of the skin or other integumentary structures. The NANDA-I definition of impaired tissue integrity is, "Damage to the mucous membrane, cornea, integumentary system, muscular fascia, muscle, tendon, bone, cartilage, joint capsule, and/or ligament." (Chapter 10.2)

Incentive spirometer: A medical device commonly prescribed after surgery to reduce the buildup of fluid in the lungs and to prevent pneumonia. While sitting upright, the client should breathe in slowly and deeply through the tubing with the goal of raising the piston to a specified level. The client should attempt to hold their breath for 5 seconds, or as long as tolerated, and then rest for a few seconds. This technique should be repeated by the client 10 times every hour while awake. (Chapter 8.2)

Incident reports: Also called variance reports, incident reports are a specific type of documentation that is completed when there is an unexpected occurrence, such as a medication error, client injury, or client fall, or a near miss, where an error did not actually occur, but was prevented from occurring. (Chapter 2.5)

Incomplete proteins: Proteins that do not contain enough amino acids to sustain life. Incomplete proteins can be combined with other types of proteins to add to amino acids consumed to form complete protein combinations. (Chapter 14.2)

Incubation period: The period of a disease after the initial entry of the pathogen into the host but before symptoms develop. (Chapter 9.4)

Independent nursing interventions: Any intervention that the nurse can provide without obtaining a prescription or consulting anyone else. (Chapter 4.6)

Indirect care: Interventions performed by the nurse in a setting other than directly with the client. An example of indirect care is creating a nursing care plan. (Chapter 4.6)

Inductive reasoning: A type of reasoning that involves forming generalizations based on specific incidents. (Chapter 4.2)

Infection: The invasion and growth of a microorganism within the body. (Chapter 9.4)

Inference: Interpretations or conclusions based on cues, personal experiences, preferences, or generalizations. (Chapter 4.3)

Inflammation: A response triggered by a cascade of chemical mediators that occur when pathogens successfully breach the nonspecific physical defenses of the immune system or when an injury occurs. (Chapter 9.3)

Inflammatory phase of wound healing: The second stage of healing when vasodilation occurs to move white blood cells into the wound to start cleaning the wound bed. (Chapter 10.3)

Insomnia: A common sleep disorder that causes trouble falling asleep, staying asleep, or getting good quality sleep. Insomnia interferes with daily activities and causes the person to feel unrested or sleepy during the day. Short-term insomnia may be caused by stress or changes in one's schedule or environment, lasting a few days or weeks. Chronic insomnia occurs three or more nights a week, lasts more than three months, and cannot be fully explained by another health problem or a medicine. Chronic insomnia raises the risk of high blood pressure, coronary heart disease, diabetes, and cancer. (Chapter 12.2)

Intellectual disability: A diagnostic term that describes intellectual and adaptive functioning deficits identified during the developmental period prior to the age 18. (Chapter 6.2)

Intracellular fluids (ICF): Fluids found inside cells consisting of protein, water, and electrolytes. (Chapter 15.2)

Intersectionality: The many ways in which a person expresses their cultural identity are not separated but are closely intertwined. (Chapter 3.2)

Interstitial fluids: Fluids found between the cells and outside of the vascular system. (Chapter 15.2)

Intestinal obstruction: A partial or complete blockage of the intestines so that contents of the intestine cannot pass through it. (Chapter 16.6)

Intimate partner violence (IPV): Physical or sexual violence, stalking, and psychological or coercive aggression by current or former intimate partners. (Chapter 5.8)

Intracellular Fluids (ICF): Fluids found inside cells consisting of protein, water, and electrolytes. (Chapter 15.2)

Intravascular fluids: Fluids found in the vascular system consisting of the body's arteries, veins, and capillary networks. (Chapter 15.2)

Invasion: The spread of a pathogen throughout local tissues or the body. (Chapter 9.4)

ISBARR: A mnemonic for the components of health care team member communication that stands for Introduction, Situation, Background, Assessment, Request/Recommendations, and Repeat back. (Chapter 2.4, Chapter 5.3)

Isotonic solution: Intravenous fluids with a similar concentration of dissolved particles as blood plasma. (Chapter 15.3)

J

Just culture: A quality of an institutional culture of safety where people feel safe raising questions and concerns and reporting safety events in an environment that emphasizes a nonpunitive response to errors and near misses, but clear lines are drawn between human error, at-risk, and reckless behaviors. (Chapter 5.4)

Justice: A principle and moral obligation to act on the basis of equality and equity; a standard linked to fairness for all in society. (Chapter 3.2)

K

Kinesthetic impairment: An altered sense of touch that can cause difficulty in performing fine motor tasks. (Chapter 7.2)

L

Lactation: Breast milk production. (Chapter 14.3)

Lateral positioning: A position where the client lies on one side of the body with the top leg over the bottom leg. This position helps relieve pressure on the coccyx. (Chapter 13.2)

Learning culture: A quality of an institutional culture of safety where people regularly collect information and learn from errors and successes. Data is openly shared and evidence-based practices are used to improve work processes and client outcomes. (Chapter 5.4)

LGBTQAI+: Lesbian, gay, bisexual, transgender, queer, or questioning in reference to sexual orientation. (Chapter 3.2)

Licensed Practical Nurse/Vocational Nurse (LPN/LVN): An individual who has completed a state-approved practical or vocational nursing program, passed the NCLEX-PN examination, and is licensed by their state Board of Nursing to provide client that describes the client's wishes if they are no longer able to speak for themselves due to injury, illness, or a persistent vegetative state. The living will addresses issues like ventilator support, feeding tube placement, cardiopulmonary resuscitation, and intubation. (Chapter 17.2)

Local infection: Infection confined to a small area of the body, typically near the portal of entry, and usually presents with signs of redness, warmth, swelling, and pain. Purulent drainage may be present and extensive tissue involvement can cause decreased function. (Chapter 9.4)

Loss: The absence of a possession or future possession with the response of grief and the expression of mourning. (Chapter 17.2)

M

Maceration: A condition that occurs when skin has been exposed to moisture for too long causing it to appear soggy, wrinkled, or whiter than usual. (Chapter 10.2)

Macrominerals: Minerals needed in larger amounts and measured in milligrams, grams, and milliequivalents. (Chapter 14.2)

Macronutrients: Nutrients needed in larger amounts due to energy needs. Macronutrients include carbohydrates, proteins, and fats. (Chapter 14.2)

Macular degeneration: Loss of central vision with symptoms such as blurred central vision, distorted vision that causes difficulty driving and reading, and the requirement for brighter lights and magnification for close-up visual activities. (Chapter 7.2)

Malpractice: A specific term that looks at a standard of care, as well as the professional status of the caregiver. (Chapter 1.6)

Maslow's Hierarchy of Needs: A theory used to prioritize the most urgent client needs to address first. The bottom levels of the pyramid represent the most important physiological needs intertwined with safety. (Chapter 4.4)

Mastication: The chewing of food in the mouth. (Chapter 14.2)

Maturation phase of wound healing: The final stage of wound healing when collagen continues to be created to strengthen the wound and prevent it from reopening. (Chapter 10.3)

Mechanical digestion: Breaking food down into small chunks through chewing prior to swallowing. (Chapter 14.2)

Mechanical lift: A hydraulic lift with a sling used to move clients who cannot bear weight or have a medical condition that does not allow them to stand or assist with moving. It can be a portable device or permanently attached to the ceiling. (Chapter 13.2)

Meconium: The black to dark green, sticky first bowel movement of a newborn. (Chapter 16.2)

Medical diagnosis: A disease or illness diagnosed by a physician or advanced health care provider such as a nurse practitioner or physician's assistant. Medical diagnoses are a result of clustering signs and symptoms to determine what is medically affecting an individual. (Chapter 4.3)

Medical restraints: Restraints used to manage nonviolent, non-self-destructive behaviors such as the client attempting to remove life-sustaining tubes, drains, IV catheters, urinary catheters, or endotracheal tubes. (Chapter 5.7)

Melena: Black, sticky, tar-looking stools. Melena is typically caused by bleeding in the upper part of the gastrointestinal tract, such as the esophagus, stomach, or the first part of the small intestine, or due to the client swallowing blood. The blood appears darker and tarry-looking because it undergoes digestion on its way through the GI tract. (Chapter 16.2)

Microbiome: Every human being carries their own individual suite of microorganisms in and on their body referred to as their microbiome. A person's microbiome is acquired at birth and evolves over their lifetime. It is different across body sites and between individuals. (Chapter 9.2)

Microsleep: Brief moments of sleep that occur when a person is awake. A person can't control microsleep and might not be aware of it. (Chapter 12.2)

Minimum Data Set (MDS): A federally mandated assessment tool used in skilled nursing facilities to track a client's goal achievement, as well as to coordinate the efforts of the health care team to optimize the resident's quality of care and quality of life. (Chapter 2.5)

Misuse: Taking prescription pain medications in a manner or dose other than prescribed; taking someone else's prescription, even if for a medical complaint such as pain; or taking a medication to feel euphoria (i.e., to get high). (Chapter 11.2)

Mixed urinary incontinence: Urinary frequency, urgency, and stress incontinence. (Chapter 16.4)

Mobility: The ability of a client to change and control body position. Mobility exists on a continuum ranging from no impairment (i.e., the client can make major and frequent changes in position without assistance) to being

completely immobile (i.e., the client is unable to make even slight changes in body or extremity position without assistance). (Chapter 13.2)

Morality: Personal values, character, or conduct of individuals within communities and societies. (Chapter 1.6)

Mourning: The outward, social expression of loss. Individuals outwardly express loss based on their cultural norms, customs, and practices, including rituals and traditions. (Chapter 17.2)

N

Narcolepsy: An uncommon sleep disorder that causes periods of extreme daytime sleepiness and sudden, brief episodes of deep sleep during the day. (Chapter 12.2)

Narrative note: A type of documentation that chronicles all of the client's assessment findings and nursing activities that occurred throughout the shift. (Chapter 2.5)

National Patient Safety Goals: Annual safety goals and recommendations tailored for seven different types of health care agencies based on client safety data from experts and stakeholders. (Chapter 5.5)

Near misses: An unplanned event that did not result in a client injury or illness but had the potential to. (Chapter 5.2)

Necrosis: Tissue death. (Chapter 10.2)

Necrotic: Dead tissue that is black. (Chapter 10.2)

Negligence: A "general term that denotes conduct lacking in due care, carelessness, and a deviation from the standard of care that a reasonable person would use in a particular set of circumstances." (Chapter 1.6)

Never events: Adverse events that are clearly identifiable, measurable, serious (resulting in death or significant disability), and preventable. (Chapter 5.2)

Nitrogen balance: The net loss or gain of nitrogen excreted compared to nitrogen taken into the body in the form of protein consumption; an indicator of protein status where a negative nitrogen balance equates to a protein

deficit in the diet and a positive nitrogen balance equates to a protein excess in the diet. (Chapter 14.2)

Nociceptor: A sensory receptor for painful stimuli. (Chapter 11.2)

Nocturia: The need for a client to get up at night on a regular basis to urinate. Nocturia often causes sleep deprivation that affects a person's quality of life. (Chapter 16.2)

Nonblanchable erythema: Skin redness that does not turn white when pressed. (Chapter 10.4)

Non-REM sleep: Slow-wave sleep when restoration takes place and the body's temperature, heart rate, and oxygen consumption decrease. (Chapter 12.2)

Nonspecific innate immunity: A system of defenses in the body that targets invading pathogens in a nonspecific manner that is present from the moment we are born. Nonspecific innate immunity includes physical defenses, chemical defenses, and cellular defenses. (Chapter 9.3)

Nontherapeutic responses: Responses to clients that block communication, expression of emotion, or problem-solving. (Chapter 2.3)

Normal flora: Microorganisms that live on our skin and in the nasopharynx and gastrointestinal tracts and don't cause an infection unless the host becomes susceptible. (Chapter 9.2)

Normal grief: The common feelings, behaviors, and reactions to loss. (Chapter 17.2)

Nurse Licensure Compact (NLC): Allows a nurse to have one multistate license with the ability to practice in the home state and other compact states. (Chapter 1.5)

Nurse Practice Act (NPA): Legislation enacted by each state that establishes regulations for nursing practice within that state by defining the requirements for licensure, as well as the scope of nursing practice. (Chapter 1.3)

Nursing: Nursing integrates the art and science of caring and focused on the protection, promotion, and optimization of health and human functioning; prevention of illness and injury; facilitation of healing; and alleviation of suffering through compassionate presence. Nursing is the diagnosis and treatment of human responses and advocacy in the care of

individuals, families, groups, communities, and populations in recognition of the connection of all humanity. (Chapter 1.3, Chapter 4.2)

Nursing care plan: Specific documentation of the planning and delivery of nursing care that is required by The Joint Commission. (Chapter 4.2)

Nursing diagnosis: A clinical judgment concerning a human response to health conditions/life processes, or susceptibility to that response, by an individual, caregiver, family, group, or community. (Chapter 4.4)

Nursing process: A systematic approach to client-centered care with steps including assessment, diagnosis, outcome identification, planning, implementation, and evaluation; otherwise known by the mnemonic "ADOPIE." (Chapter 4.1)

Nutrient-dense foods: Foods with a high proportion of nutritional value relative to calories contained in the food. (Chapter 14.2)

O

Objective data: Data that the nurse can see, touch, smell, or hear or is reproducible such as vital signs. Laboratory and diagnostic results are also considered objective data. (Chapter 4.3)

Obstructive sleep apnea (OSA): A common sleep condition that occurs when the upper airway becomes repeatedly blocked during sleep, reducing or completely stopping airflow. If the brain does not send the signals needed to breathe, the condition may be called central sleep apnea. (Chapter 12.2)

Occult blood: Hidden blood in the stool not visible to the naked eye. (Chapter 16.9)

Oliguria: Decreased urine output, defined as less than 500 mL urine in adults in a 24-hour period. In hospitalized clients, oliguria is further defined as less than 0.5 mL of urine per kilogram per hour for adults and children or less than 1 mL of urine per kilogram per hour for infants. (Chapter 16.2)

Oncotic pressure: Pressure inside the vascular compartment created by protein content of the blood (in the form of albumin) that holds water inside the blood vessels. (Chapter 15.2)

Opioid intoxication: Significant behavioral or psychological changes (e.g., apathy, dysphoria, psychomotor agitation or retardation, or impaired judgment) that occur during or shortly after opioid use. Symptoms of opioid intoxication include drowsiness or coma, slurred speech, or impairment in attention or memory. (Chapter 11.2)

Opportunistic pathogen: A pathogen that only causes disease in situations that compromise the host's defenses, such as the body's protective barriers, immune system, or normal microbiota. Individuals susceptible to opportunistic infections include the very young, the elderly, women who are pregnant, clients undergoing chemotherapy, people with immunodeficiencies (such as acquired immunodeficiency syndrome [AIDS]), clients who are recovering from surgery, and those who have had a breach of protective barriers (such as a severe wound or burn). (Chapter 9.4)

Orthopnea: Difficulty in breathing that occurs when lying down and is relieved upon changing to an upright position. (Chapter 8.3)

Orthostatic hypotension: Low blood pressure that occurs when a client changes position from lying to sitting or sitting to standing that causes symptoms of dizziness or light-headedness. Orthostatic hypotension is defined as a drop in systolic blood pressure of 20 mm Hg or more or a drop of diastolic blood pressure of 10 mm Hg or more within three minutes of sitting or standing. (Chapter 13.2)

Osmolality: Proportion of dissolved particles in a specific weight of fluid. (Chapter 15.2, Chapter 15.3)

Osmolarity: Proportion of dissolved particles or solutes in a specific volume of fluid. (Chapter 15.3)

Osmosis: Movement of fluid through a semipermeable membrane from an area of lesser solute concentration to an area of greater solute concentration. (Chapter 15.2)

Outcome: A measurable behavior demonstrated by the client that is responsive to nursing interventions. (Chapter 4.5)

Overdose: The biological response of the human body when too much of a substance is ingested. (Chapter 11.2)

Overflow incontinence: Occurs when small amounts of urine leak from a bladder that is always full. This condition tends to occur in males with

enlarged prostates that prevent the complete emptying of the bladder. (Chapter 16.4)

P

PaCO2: Partial pressure of carbon dioxide level in arterial blood indicated in an ABG result. Normal range is 35-45 mmHg. (Chapter 8.2)

Pain: An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage. (Chapter 11.2)

Palliative care: Client and family-centered care that optimizes quality of life by anticipating, preventing, and treating suffering. Palliative care occurs throughout the continuum of care and involves the interdisciplinary team collaboratively addressing physical, intellectual, emotional, social, and spiritual needs and facilitating client autonomy, access to information, and choice. (Chapter 17.2)

PaO2: Partial pressure of oxygen level in arterial blood indicated in an ABG result. Normal range is 80-100 mmHg. (Chapter 8.2)

Paralytic ileus: A condition where peristalsis is not propelling the contents through the intestines. (Chapter 16.6)

Parenteral nutrition: An intravenous solution containing glucose, amino acids, minerals, electrolytes, and vitamins, along with supplemental lipids. (Chapter 14.3)

Partially complete proteins: Proteins that have enough amino acids to sustain life, but not enough for tissue growth and maintenance. Typically interchanged with incomplete proteins. (Chapter 14.2)

PASS: A mnemonic for actions to take when using a fire extinguisher, including Pull, Aim, Squeeze, and Sweep. (Chapter 5.9)

Passive range-of-motion exercises: Movement applied to a joint solely by another person or a passive motion machine. When passive range of motion is applied, the joint of an individual receiving exercise is completely relaxed while the outside force moves the body part. (Chapter 13.2)

Passive transport: Movement of fluids or solutes down a concentration gradient where no energy is used during the process. (Chapter 15.2)

Pathogens: Microorganisms that cause disease. (Chapter 9.2)

Pathogenicity: The ability of a microorganism to cause disease. (Chapter 9.4)

Patient confidentiality: Keeping your client's Protected Health Information (PHI) protected and known only by those health care team members directly providing care for the client (Chapter 1.6)

Patient-Controlled Analgesia (PCA): A method of pain management that allows hospitalized clients with severe pain to safely self-administer opioid medications using a programmed pump according to their level of discomfort. (Chapter 11.4)

Perception: The interpretation of sensation during the sensory process. (Chapter 7.2)

Perfusion: The passage of blood through the arteries to an organ or tissue. (Chapter 8.2)

Peristalsis: Coordinated muscle movements in the esophagus that move food or liquid through the esophagus and into the stomach or coordinated muscle movements in the intestines that move food/waste products through the intestines. (Chapter 9.3, Chapter 14.2, Chapter 16.2)

Personal Protective Equipment (PPE): Gloves, gowns, face shields, goggles, and masks used to prevent the spread of infection to and from clients and health care providers. (Chapter 9.6)

PES format: The format of a nursing diagnosis statement that includes:

- Problem (P) – statement of the client problem (i.e., the nursing diagnosis)
- Etiology (E) – related factors (etiology) contributing to the cause of the nursing diagnosis
- Signs and Symptoms (S) – defining characteristics manifested by the client of that nursing diagnosis (Chapter 4.4)

Ph level: A measurement of acidity or alkalinity of the blood. The normal range of pH level for arterial blood is 7.35-7.45. (Chapter 8.2)

Physical dependence: Withdrawal symptoms that occur when chronic pain medication is suddenly reduced or stopped because of physiological

adaptations that occur from chronic exposure to the medication. (Chapter 11.2)

Polyuria: Greater than 2.5 liters of urine output over 24 hours; also referred to as diuresis. Urine is typically clear with no color. (Chapter 16.2)

Portal of entry: An anatomic site through which pathogens can pass into a host, such as mucous membranes, skin, respiratory, or digestive systems. (Chapter 9.4)

Post-void residual: A measurement of urine left in the bladder after a client has voided by using a bladder scanner or straight catheterization. (Chapter 16.5)

Prejudice: To "prejudge"; a preconceived idea, often unfavorable, about a person or group of people. (Chapter 3.2)

Presbycusis: Age-related hearing loss. (Chapter 7.2)

Presbyopia: The impairment of near vision and accommodation as the lens of the eye gradually becomes thicker and loses flexibility as a person ages. (Chapter 7.2)

Prescription: Orders, interventions, remedies, or treatments ordered or directed by an authorized primary health care provider. (Chapter 4.2)

Pressure injuries: Localized damage to the skin or underlying soft tissue, usually over a bony prominence, as a result of intense and prolonged pressure in combination with shear. (Chapter 10.4)

Primary care: Care that is provided to clients to promote wellness and prevent disease from occurring. This includes health promotion, education, protection (such as immunizations), early disease screening, and environmental considerations. (Chapter 1.4)

Primary data: Information collected from the client. (Chapter 4.3)

Primary health care provider: Member of the health care team (usually a medical physician, nurse practitioner, etc.) licensed and authorized to formulate prescriptions on behalf of the client. (Chapter 4.6)

Primary intention: A type of wound that is sutured, stapled, glued, or otherwise closed so the wound heals beneath the closure. (Chapter 10.3)

Primary pathogen: A pathogen that can cause disease in a host regardless of the host's resident microbiota or immune system. (Chapter 9.4)

Prioritization: The skillful process of deciding which actions to complete

first, second, or third for optimal client outcomes and to improve client safety. (Chapter 4.4)

Problem-focused nursing diagnosis: A clinical judgment concerning an undesirable human response to health condition/life processes that exist in an individual, family, group, or community. (Chapter 4.4)

Prodromal period: The disease stage after the incubation period when the pathogen continues to multiply and the host begins to experience general signs and symptoms of illness that result from activation of the immune system, such as fever, pain, soreness, swelling, or inflammation. Usually, such signs and symptoms are too general to indicate a particular disease. (Chapter 9.4)

Progressive relaxation: Types of relaxation techniques that focus on reducing muscle tension and using mental imagery to induce calmness. (Chapter 2.2)

Proliferative phase of wound healing: The third stage of wound healing that begins a few days after injury and includes four processes: epithelialization, angiogenesis, collagen formation, and contraction. (Chapter 10.3)

Prone positioning: A position where the client lies on their stomach with their head turned to the side. (Chapter 13.2)

Proprioception: The sense of the position of our bones, joints, and muscles. (Chapter 7.2)

Proteins: Sources of peptides, amino acids, and some trace elements that provide 4 kcal/g of energy. Proteins are necessary for tissue repair, tissue function, growth, fluid balance, and clotting, as well as energy in the absence of sufficient intake of carbohydrates. (Chapter 14.2)

Protocol: A precise and detailed written plan for a regimen of therapy. (Chapter 1.3)

Provider: A physician, podiatrist, dentist, optometrist, or advanced practice nurse provider. (Chapter 1.4)

Pursed-lip breathing: A breathing technique that encourages a person to inhale through the nose and exhale through the mouth at a slow, controlled flow. (Chapter 8.2)

Purulent: Drainage that is thick; opaque; tan, yellow, green, or brown in

color. New purulent drainage should always be reported to the health care provider. (Chapter 10.6)

Purulent sputum: Yellow or green sputum that often indicates a respiratory infection. (Chapter 8.3)

Pyuria: At least ten white blood cells in each cubic millimeter of urine in a urine sample that typically indicates infection. In some cases, pus may be visible in the urine. (Chapter 16.2)

Q

Quality: The degree to which nursing services for health care consumers, families, groups, communities, and populations increase the likelihood of desirable outcomes and are consistent with evolving nursing knowledge." (Chapter 1.8)

Quality improvement: The "combined and unceasing efforts of everyone — health care professionals, clients and their families, researchers, payers, planners, and educators — to make the changes that will lead to better client outcomes (health), better system performance (care), and better professional development (learning)." (Chapter 4.7)

R

Race: A socially constructed idea; there are no truly genetically or biologically distinct races. Humans are biologically similar to each other, not different. (Chapter 3.2)

RACE: A mnemonic for actions to immediately take during a fire, standing for Rescue, Activate, Confine, and Extinguish. (Chapter 5.9)

Racism: The presumption that races are distinct from one another and

there is a hierarchy to race, implying that races are unequal. In racism, expression of one's cultural beliefs is viewed as a heritable trait. (Chapter 3.2)

Range-of-motion (ROM) exercises: Activities aimed to facilitate movement of specific joints and promote mobility of extremities. (Chapter 13.2)

Rapport: Developing a relationship of mutual trust and understanding. (Chapter 4.2)

Reaction: The response that individuals have to a perception of a received stimulus. (Chapter 7.2)

Reception: The initial part of the sensory process when a nerve cell or sensory receptor is stimulated by a sensation. (Chapter 7.2)

Receptive aphasia: A type of aphasia where the client has difficulty in understanding what is being communicated to them. The client may be able to verbalize their thoughts and feelings but does not understand what is spoken to them. (Chapter 2.3)

Reckless behavior: According to the Just Culture model, an error that occurs when an action is taken with conscious disregard for a substantial and unjustifiable risk. (Chapter 5.4)

Rectal bleeding: Bright red blood in the stools; also referred to as hematochezia. (Chapter 16.2)

Referred pain: Pain perceived at a location other than the site of the painful stimulus. For example, pain from retained gas in the colon can cause pain to be perceived in the shoulder. (Chapter 11.2)

Refined grains: Grains that have been processed to remove parts of the grain kernel and supply little fiber. (Chapter 14.2)

Registered Nurse (RN): An individual who has graduated from a state-approved school of nursing, passed the NCLEX-RN examination, and is licensed by a state board of nursing to provide client care. (Chapter 1.4, Chapter 1.5, Chapter 4.3)

Related factors: The underlying cause (etiology) of a nursing diagnosis when creating a PES statement. (Chapter 4.4)

Relaxation breathing: A breathing technique used to reduce anxiety and control the stress response. (Chapter 2.2)

Religion: A unified system of beliefs, values, and practices that a person holds sacred or considers to be spiritually significant. Spiritual practices often

unite a moral community called a church. Some people associate religion with a place of worship (e.g., a synagogue or church), a practice (e.g., attending religious services, receiving communion, or going to confession), or a concept that guides one's daily life (e.g., sin or karma). (Chapter 18.3)

REM sleep: Rapid eye movement (REM) sleep when heart rate and respiratory rate increase, eyes twitch, and brain activity increases. Dreaming occurs during REM sleep, and muscles become limp to prevent acting out one's dreams. (Chapter 12.2)

Renin-Angiotensin-Aldosterone System (RAAS): A body system that regulates extracellular fluids and blood pressure by regulating fluid output and electrolyte excretion. (Chapter 15.2)

Respite care: Care provided at home (by a volunteer or paid service) or in a care setting, such as adult day centers or residential facilities, that allows the caregiver to take a much-needed break. (Chapter 6.3)

Reporting culture: A quality of an institutional culture of safety where people realize errors are inevitable and are encouraged to speak up for client safety by reporting errors and near misses. (Chapter 5.4)

Respiration: Gas exchange occurs at the alveolar level where blood is oxygenated, and carbon dioxide is removed. (Chapter 8.2)

Restraint: A device, method, or process that is used for the specific purpose of restricting a client's freedom of movement without the permission of the person. (Chapter 5.7)

Risk nursing diagnosis: A clinical judgment concerning the vulnerability of an individual, family, group, or community for developing an undesirable human response to health conditions/life processes. (Chapter 4.4)

Root cause analysis: A structured method used to analyze serious adverse events to identify underlying problems that increase the likelihood of errors, while avoiding the trap of focusing on mistakes by individuals. (Chapter 5.2)

S

Safety culture: A culture established within health care agencies that

empowers nurses, nursing students, and other staff members to speak up about risks to clients and to report errors and near misses, all of which drive improvement in client care and reduce the incident of client harm. (Chapter 1.3)

Safety Data Sheets (SDS): Safety Data Sheets, formerly referred to as Material Safety Data Sheets (MSDS), are hazardous communication sheets that let workers know certain information about chemicals they encounter in the workplace. OSHA requires that SDS's are readily available and easily readable for each chemical in the workplace. (Chapter 5.9)

Sanguineous: Drainage from a wound that is fresh bleeding. (Chapter 10.6)

SaO2: Calculated oxygen saturation level in an ABG result. Normal range is 95-100%. (Chapter 8.2)

Saturated fats: Fats derived from animal products, such as butter, tallow, and lard for cooking, or from meat products such as steak. Saturated fats are generally solid at room temperature and can raise cholesterol levels, contributing to heart disease. (Chapter 14.2)

Scheduled hourly rounds: Scheduled hourly visits to each client's room to integrate fall prevention activities with the rest of a client's care. (Chapter 5.6)

Scope of practice: Services that a qualified health professional is deemed competent to perform and permitted to undertake – in keeping with the terms of their professional license. (Chapter 1.1)

Seclusion: The confinement of a client in a locked room from which they cannot exit on their own. It is generally used as a method of discipline, convenience, or coercion. (Chapter 5.7)

Secondary care: Care that occurs when a person has contracted an illness or injury and is in need of medical care. (Chapter 1.4)

Secondary data: Information collected from sources other than the client. (Chapter 4.3)

Secondary infection: An infection occurring as a result of treatment for a primary infection, or an infection in addition to the primary infection as a result of a diminished immune system or the elimination of normal flora. For examples, a yeast infection that occurs after treatment with antibiotics for pneumonia is a secondary infection. (Chapter 9.4)

Secondary intention: A type of healing that occurs when the edges of a

wound cannot be brought together, so the wound fills in from the bottom up by the production of granulation tissue. An example of a wound healing by secondary intention is a pressure ulcer. (Chapter 10.3)

Self-determination: Refers to a person's right to determine what will be done with and to their own body. (Chapter 3.8)

Semi-Fowler's positioning: A position where the head of the bed is placed at a 30- to 45-degree angle. The client's hips may or may not be flexed. (Chapter 13.2)

Sensory deprivation: A condition that occurs when there is a lack of sensations due to sensory impairments or when the environment has few quality stimuli. (Chapter 7.2)

Sensory impairment: Any type of difficulty that an individual has with one of their five senses or sensory function. (Chapter 7.2)

Sensory overload: A condition that occurs when an individual receives too many stimuli or cannot selectively filter meaningful stimuli. (Chapter 7.2)

Sentinel event: An unexpected occurrence involving death or serious physiological or psychological injury or the risk thereof. (Chapter 5.2)

Sepsis: An existing infection that triggers an exaggerated inflammatory reaction called SIRS throughout the body. If left untreated, sepsis causes tissue damage and quickly spreads to multiple organs. It is a life-threatening medical emergency. (Chapter 9.4)

Septicemia: Bacteria that are both present and multiplying in the blood. (Chapter 9.4)

Septic shock: Severe sepsis that leads to a life-threatening decrease in blood pressure (systolic pressure <90 mm Hg), preventing cells and other organs from receiving enough oxygen and nutrients. It can cause multi-organ failure and death. (Chapter 9.4)

Serosanguineous: Serous drainage with small amounts of blood present. (Chapter 10.6)

Serous: Drainage from a wound that is clear, thin, watery plasma. It's normal during the inflammatory stage of wound healing, and small amounts are considered normal wound drainage. (Chapter 10.6)

Sexuality: Encompasses sex, sexual orientation, gender identity, gender roles, among other topics. (Chapter 3.6)

Sexual orientation: A person's physical and emotional interest or desire for others. Sexual orientation is on a continuum and is manifested in one's self-identity and behaviors. (Chapter 3.2)

Shear: Damage that occurs when tissue layers move over the top of each other, causing blood vessels to stretch and break as they pass through the subcutaneous tissue. (Chapter 10.4)

Simple carbohydrates: Small molecules of monosaccharides or disaccharides that break down quickly and raise blood glucose levels quickly. (Chapter 14.2)

Simple human error: According to the Just Culture model, this is an error that occurs when an individual inadvertently does something other than what should have been done. Most errors are the result of human error due to poor processes, programs, education, environmental issues, or situations. These are managed by correcting the cause, looking at the process, and fixing the deviation. (Chapter 5.4)

Sim's positioning: A position where the client is positioned halfway between the supine and prone positions with their legs flexed. (Chapter 13.2)

Sit to stand lifts: Mobility devices that assist weight-bearing clients who are unable to transition from a sitting position to a standing position by using their own strength. They are used to safely transfer clients who have some muscular strength, but not enough strength to safely change positions by themselves. Some sit to stand lifts use a mechanized lift whereas others are nonmechanized. (Chapter 13.2)

Sleep apnea: A common sleep condition that occurs when the upper airway becomes repeatedly blocked during sleep, reducing or completely stopping airflow. If the brain does not send the signals needed to breathe, the condition may be called central sleep apnea. (Chapter 12.2)

Sleep diary: A record of the time a person goes to sleep, wakes up, and takes naps each day for 1-2 weeks. Timing of activities such as exercising and drinking caffeine or alcohol are also recorded, as well as feelings of sleepiness throughout the day. (Chapter 12.2)

Sleep study: A diagnostic test that monitors and records data during a client's full night of sleep. A sleep study may be performed at a sleep center or at home with a portable diagnostic device. (Chapter 12.2)

Sleep-wake homeostasis: The homeostatic sleep drive keeps track of the need for sleep, reminds the body to sleep after a certain time, and regulates sleep intensity. This sleep drive gets stronger every hour a person is awake and causes individuals to sleep longer and more deeply after a period of sleep deprivation. (Chapter 12.2)

Slider board: A board (also called a transfer board) used to transfer an immobile client from one surface to another while the client is lying supine (e.g., from a stretcher to hospital bed). (Chapter 13.2)

Slough: Inflammatory exudate in wounds that is usually light yellow, soft, and moist. (Chapter 10.4)

SOAPIE: A mnemonic for a type of documentation that is organized by six categories: Subjective, Objective, Assessment, Plan, Interventions, and Evaluation. (Chapter 2.5)

Social determinants of health: Nonmedical factors that influence health outcomes, including conditions in which people are born, grow, work, live, and age, and the wider sets of forces and systems shaping the conditions of daily life. (Chapter 3.2)

Social justice: Equal rights, equal treatment, and equitable opportunities for all. (Chapter 3.2)

Somatosensation: Sensory receptors that respond to specific stimuli such as pain, pressure, temperature, and vibration; includes vestibular sensation and proprioception. (Chapter 7.2)

Specific adaptive immunity: The immune response that is activated when the nonspecific innate immune response is insufficient to control an infection. There are two types of adaptive responses: the cell-mediated immune response, which is carried out by T cells, and the humoral immune response, which is controlled by activated B cells and antibodies. (Chapter 9.3)

SPICES tool: Focuses on areas of common problems for aging individuals and can lead to early intervention and treatment. (Chapter 19.3)

Spiritual distress: A state of suffering related to the impaired ability to integrate meaning and a purpose in life through connections with self, others, the world, and/or a power greater than oneself. (Chapter 18.2)

Spirituality: A dynamic and intrinsic aspect of humanity through which persons seek ultimate meaning, purpose, and transcendence and experience

relationships to self, family, others, community, society, nature, and the significant or sacred. Spirituality is expressed through beliefs, values, traditions, and practice. (Chapter 18.2)

SpO2: Hemoglobin saturation level measured by pulse oximetry. Normal range is 94-98%. (Chapter 8.2)

Sputum: Mucus and other secretions that are coughed up and expelled from the mouth. (Chapter 8.3)

Stage 1 pressure injuries: Intact skin with a localized area of nonblanchable erythema where prolonged pressure has occurred. (Chapter 10.4)

Stage 2 pressure injuries: Partial-thickness loss of skin with exposed dermis. The wound bed is viable and may appear like an intact or ruptured blister. (Chapter 10.4)

Stage 3 pressure injuries: Full-thickness tissue loss in which fat is visible, but cartilage, tendon, ligament, muscle, and bone are not exposed. The depth of tissue damage varies by anatomical location. Undermining and tunneling may be present. If slough or eschar obscures the wound so that tissue loss cannot be assessed, the pressure injury is referred to as unstageable. (Chapter 10.4)

Stage 4 pressure injuries: Full-thickness tissue loss like Stage 3 pressure injuries but also have exposed cartilage, tendon, ligament, muscle, or bone. (Chapter 10.4)

Standard precautions: The minimum infection prevention practices that apply to all client care, regardless of suspected or confirmed infection status of the client, in any setting where health care is delivered. (Chapter 9.6)

Stereotyping: Assuming that a person has the attributes, traits, beliefs, and values of a group because they are a member of that group. (Chapter 3.2)

Sterile technique: A process, also called surgical asepsis, used to eliminate every potential microorganism in and around a sterile field while also maintaining objects as free from microorganisms as possible. It is the standard of care for surgical procedures, invasive wound management, and central line care. Sterile technique requires a combination of meticulous hand washing, creating a sterile field, using long-lasting antimicrobial cleansing agents such as Betadine, donning sterile gloves, and using sterile devices and instruments. (Chapter 9.6)

Sterilization: A process used to destroy all pathogens from inanimate objects, including spores and viruses. (Chapter 9.6)

Stress urinary incontinence: The involuntary loss of urine on intra-abdominal pressure (e.g., laughing and coughing) or physical exertion (e.g., jumping). (Chapter 16.4)

Subculture: A smaller group of people within a larger culture, often based on a person's occupation, hobbies, interests, or place of origin. (Chapter 3.2)

Subjective data: Information obtained from the client and/or family members that offers important cues from their perspectives. When documenting subjective data stated by a client, it should be in quotation marks and start with verbiage such as, "*The client reports...*" (Chapter 4.3)

Substance abuse: A maladaptive pattern of continued use of alcohol or a drug despite it causing persistent social, occupational, psychological, or physical problems that can be physically hazardous. (Chapter 5.8)

Substance abuse disorder: Significant impairment or distress from a pattern of substance use (i.e., alcohol, drugs or misuse of prescription medications). (Chapter 11.2)

Sundowning: Increased confusion, anxiety, agitation, pacing, or disorientation in clients with dementia that typically begins at dusk and continues throughout the night. (Chapter 6.3)

Supine positioning: A position where the client lies flat on their back. (Chapter 13.2)

Syndrome nursing diagnosis: A clinical judgment concerning a specific cluster of nursing diagnoses that occur together and are best addressed together and through similar interventions. (Chapter 4.4)

Systemic infection: An infection that becomes disseminated throughout the body. (Chapter 9.4)

Systemic Inflammatory Response Syndrome (SIRS): An exaggerated inflammatory response to a noxious stressor (including, but not limited to, infection and acute inflammation) that affects the entire body. (Chapter 9.4)

T

Tachypnea: Elevated respiratory rate above normal range according to the client's age. (Chapter 8.3)

T cells: Immune cells that mature in the thymus. T cells are categorized into three classes: helper T cells, regulatory T cells, and cytotoxic T cells. Helper T cells stimulate B cells to make antibodies and help killer cells develop. Killer T cells directly kill cells that have already been infected by a pathogen. T cells also use cytokines as messenger molecules to send chemical instructions to the rest of the immune system to ramp up its response. (Chapter 9.3)

Tarry stools: Stools that are black and sticky that appear like tar; also referred to as melena. (Chapter 16.2)

Tertiary care: A type of care that deals with the long-term effects from chronic illness or condition, with the purpose to restore physical and mental function that may have been lost. The goal is to achieve the highest level of functioning possible with this chronic illness. (Chapter 1.4)

Tertiary intention: The healing of a wound that has had to remain open or has been reopened, often due to severe infection. (Chapter 10.3)

Therapeutic communication: The purposeful, interpersonal information transmitting process through words and behaviors based on both parties' knowledge, attitudes, and skills, which leads to client understanding and participation. (Chapter 2.3)

Therapeutic communication techniques: Techniques that encourage clients to explore feelings, problem solve, and cope with responses to medical conditions and life events. (Chapter 2.3)

Timed get up and go test: A mobility assessment by nurses that begins by having the client stand up from an armchair, walk three yards, turn, walk back to the chair, and sit down. As the client performs these maneuvers, their posture, alignment, balance, and gait are analyzed as the client's mobility status is assessed. (Chapter 13.2)

Tinnitus: Hearing ringing in the ears. (Chapter 7.2)

Tolerance: A reduced response to pain medication when the same dose of

a drug has been given repeatedly, requiring a higher dose of the drug to achieve the same level of response. (Chapter 11.2)

Trace minerals: Minerals needed in tiny amounts. (Chapter 14.2)

Transcendence: An understanding of being part of a greater picture or of something greater than oneself, such as the awe one can experience when walking in nature. It can also be expressed as a search for the sacred through subjective feelings, thoughts, and behaviors. (Chapter 18.2)

Transcultural nursing: Incorporating cultural beliefs and practices of people to help them maintain and regain health or to face death in a meaningful way. (Chapter 3.4)

Trans fats: Fats that have been altered through hydrogenation and as such are not in their natural state. Fat is changed to make it harder at room temperature and to make it have a longer shelf life and contributes to increased cholesterol and heart disease. (Chapter 14.2)

Transferring: The action of a client moving from one surface to another. This includes moving from a bed into a chair or moving from one chair to another. (Chapter 13.2)

Transmission-based precautions: Precautions used for clients with documented or suspected infection, or colonization, of highly transmissible pathogens, such as *C. difficile* (C-diff), *Methicillin-resistant Staphylococcus aureus* (MRSA), *Vancomycin-resistant enterococci* (VRE), Respiratory Syncytial Virus (RSV), measles, and tuberculosis (TB). Three categories of transmission-based precautions are contact precautions, droplet precautions, and airborne precautions. (Chapter 9.6)

Trendelenburg positioning: A position where the head of the bed is placed lower than the client's feet. This position is used in situations such as hypotension and medical emergencies because it helps promote venous return to major organs such as the brain and heart. (Chapter 13.2)

Tripod position: A position that enhances air exchange when a client sits up and leans over by resting their arms on their legs or on a bedside table; also referred to as a three-point position. (Chapter 8.2, Chapter 13.2)

Trousseau's sign: A sign associated with hypocalcemia that causes a spasm of the hand when a blood pressure cuff is inflated. (Chapter 15.4)

Tunneling: Passageways underneath the surface of the skin that extend from a wound and can take twists and turns. (Chapter 10.4)

U

Undermining: A condition that occurs in wounds when the tissue under the wound edges becomes eroded, resulting in a pocket beneath the skin at the wound's edge. (Chapter 10.4)

Universal fall precautions: A set of interventions to reduce the risk of falls for all clients and focus on keeping the environment safe and comfortable. (Chapter 5.6)

Unlicensed Assistive Personnel (UAP): Any unlicensed person, regardless of title, who performs tasks delegated by a nurse. This includes certified nursing aides/assistants (CNAs), patient care assistants (PCAs), patient care technicians (PCTs), state tested nursing assistants (STNAs), nursing assistants-registered (NA/Rs) or certified medication aides/assistants (MA-Cs). Certification of UAPs varies between jurisdictions. (Chapter 1.4, Chapter 4.3)

Unsaturated fats: Fats derived from oils and plants, though chicken and fish contain some unsaturated fats as well. Unsaturated fats are healthier than saturated fats, and some containing omega-3 fatty acids are considered polyunsaturated fats and help lower LDL cholesterol levels. (Chapter 14.2)

Unstageable pressure injuries: Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. (Chapter 10.4)

Urgency: A sensation of an urgent need to void. Urgency may be associated with urge incontinence. (Chapter 16.2)

Urge urinary incontinence: Also referred to as "overactive bladder"; urine leakage accompanied by a strong desire to void. It can be caused by increased sensitivity to stimulation of the detrusor in the bladder or decreased inhibitory control of the central nervous system. (Chapter 16.4)

Urinary retention: A condition when the client cannot empty all of the urine from their bladder. (Chapter 16.5)

Urine specific gravity: A measurement of hydration status that measures the concentration of particles in urine. (Chapter 15.6)

V

Venous insufficiency: A condition that occurs when the cardiovascular system cannot adequately return blood and fluid from the extremities to the heart. (Chapter 10.2)

Ventilation: Mechanical movement of air into and out of the lungs. (Chapter 8.2)

Verbal communication: Exchange of information using words understood by the receiver. (Chapter 2.2)

Vertigo: A sensation of dizziness as if the room is spinning. (Chapter 13.2)

Vestibular sensation: A sense of spatial orientation and balance. (Chapter 7.2)

Vibratory Positive Expiratory Pressure (PEP) Therapy: Handheld devices such as flutter valves or Acapella devices used with clients who need assistance in clearing mucus from their airways. (Chapter 8.2)

Virulence: The degree to which a microorganism is likely to become a disease. (Chapter 9.4)

W

Water-soluble vitamins: Vitamins that are not stored in the body and include vitamin C and B-complex vitamins: B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), B12 (cyanocobalamin), and B9 (folic acid, biotin, and pantothenic acid). Toxicity is rare as excess water-soluble vitamins are excreted in the urine. (Chapter 14.2)

Whole grains: Grains with the entire grain kernel that supply more fiber than refined grains. (Chapter 14.2)

Withdrawal: Symptoms that cause significant distress after stopping or reducing the use of substances (including opioids), with symptoms such as dysphoric mood, nausea, vomiting, muscle aches, rhinorrhea or lacrimation, pupillary dilation, piloerection, sweating, diarrhea, yawning, fever, or insomnia. (Chapter 11.2)