

Anorexia

PROBLEM

Anorexia is an abnormal loss of the appetite for food often associated with medical treatment (radiation therapy or chemotherapy), pain, nausea, depression, smell or taste changes, and the disease process. Cancer cells can alter the release of hormones (e.g., ghrelin) and hormone-like substances and modify the production of the neurotransmitters (e.g., dopamine, serotonin), neuropeptides, and prostaglandins that influence food consumption. Additionally, tumors can directly produce substances that reduce food intake, such as lactate, cytokines, and tryptophan (Ezeoke & Morley, 2015). The incidence of anorexia can be as high as 80% in patients with advanced disease (Thorpe et al., 2017) and is the fourth most common symptom of patients with cancer, after pain, fatigue, and weakness (Blauwhoff-Buskermolen et al., 2016).

Anorexia is closely linked to cachexia, which is a profound muscle-wasting syndrome usually seen in patients with chronic illnesses, including cancer. Patients with cachexia have involuntary loss of total body weight or skeletal muscle mass (Petruzzielli & Wagner, 2016). Typically, it cannot be reversed with standard nutritional therapy. Weight loss during cancer treatment is a significant problem and is associated with decreased survival rates (Millar, Reid, & Porter, 2013).

ASSESSMENT CRITERIA

1. What is the cancer diagnosis, and what treatment is the patient receiving?
2. Is the patient in an advanced stage of the disease or receiving chemotherapy, radiation, or immunotherapy? Has the patient had recent surgical interventions?
3. What medications is the patient taking?
Obtain medication history (Underhill & Ward, 2015).
4. Ask the patient to describe symptoms in detail (e.g., total amount of weight loss, weight loss over time).
5. Assess the quantity of the patient's weight loss, as well as the patient's current weight as it compares to ideal body weight. Ideal body weight should take into consideration height, weight, and age of the person being measured.
6. Obtain history of the problem.
 - a. Precipitating factors (e.g., weight patterns, gain and loss cycles, nutritional intake patterns, whether weighed on a single scale or on several different scales)

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- b. Onset and duration
- c. Relieving factors
- d. Any associated symptoms (e.g., nausea and vomiting, weakness, xerostomia, taste changes, fatigue, amenorrhea, polyuria, cold intolerance)
- e. Social and cultural beliefs toward food
7. Review past medical history (e.g., eating disorders).
8. Assess for changes in activities of daily living and function (Underhill & Ward, 2015).

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Lack of nutritional intake for several days • Orthostatic hypotension (dizziness when standing) • Signs of dehydration • Collapse 	Seek urgent care within two to four hours.
<ul style="list-style-type: none"> • Weight loss more than 5% of baseline in a month • Minimal nutritional intake for several days • Continued weight loss despite adherence to instructions and ingestion of supplements and prescribed appetite stimulants 	Obtain appointment to see healthcare provider within 48–72 hours.
<ul style="list-style-type: none"> • Weight loss more than 10% of baseline in six months 	<p>Yes—Obtain appointment with a health-care provider within a week.</p> <p>No—Continue with nutritional program, supplements, appetite stimulants, and other homecare instructions.</p>
Cross-references: <i>Dysphagia, Nausea and Vomiting, Xerostomia (Dry Mouth)</i>	

HOME CARE INSTRUCTIONS

- Avoid strong food odors or foods that are not appetizing.
- Try cold foods (e.g., vitamin-enhanced smoothies, sandwiches, yogurt).
- Eat several small meals per day (Underhill & Ward, 2015).
- Fortify milk by adding powdered milk.
- Add protein supplements or powdered milk to casseroles, smoothies, etc.
- Sip on nutritious drinks, such as fruit juices, when thirsty, as opposed to just water (for extra calories).
- Eat the most when you feel the hungriest, regardless of the time of day.
- Eat nutritious high-protein foods (e.g., fish, lean meat, eggs, nuts).
- Add supplements (e.g., Ensure®, ProSure®), two cans per day.
- Consult a dietitian for evaluation. This is recommended in the Oncology Nursing Society Putting Evidence Into Practice (ONS PEP) guidelines for managing anorexia (Thorpe et al., 2017).
- Follow a homecare instruction sheet for recipes and suggestions.

- Take an appetite stimulant (e.g., Marinol[®], Megace[®]) or corticosteroids, if prescribed (Ezeoke & Morley, 2015; Suzuki, Asakawa, Amitani, Nakamura, & Inui, 2013). Use of progestins to manage anorexia is recommended for practice in current ONS PEP guidelines (Thorpe et al., 2017).
- Take antiemetics for nausea, if prescribed.
- Consider alternative therapies such as acupuncture, which has been shown to possibly reduce the risk of developing anorexia with no reported side effects (Yoon, Grundmann, Williams, & Carriere, 2015).
- Remain as active as possible, using mild exercise such as walking or swimming to increase muscle mass, muscle strength, and level of physical functioning (Underhill & Ward, 2015).
- Practice relaxation exercises 30 minutes before meals to decrease stress.
- Establish a system of eating. Often, caregivers focus too much on getting patients to eat or trying to find new ways to make patients eat. A system of eating should be worked out between the patient and the caregiver. Both parties should be educated on the variety of causes of anorexia, some of which are beyond the control of the patient.

Report the Following Problems

- Continued lack of appetite with little or no food ingestion
- Continued weight loss
- Uncontrolled nausea or mouth sores that interfere with the ability to eat

Seek Emergency Care Immediately if Any of the Following Occurs

- Fainting when changing from a sitting to a standing position
- Dizziness

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Deborah Metzkes, RN, BSN, OCN®, MBA

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Bleeding

PROBLEM

Bleeding can occur secondary to injury or disease- and treatment-related factors. Problems with coagulation (coagulopathies) resulting from the use of anticoagulants or thrombocytopenia can also play a role. Bleeding can be a life-threatening event if massive blood loss (hemorrhage) occurs or if bleeding occurs in vital organs, such as the intracranial, pericardial, or pulmonary spaces (Kurtin, 2016).

ASSESSMENT CRITERIA

1. What is the cancer diagnosis, and what treatment is the patient receiving?
Bleeding can be caused by tumor invading surrounding structures or blood vessels, or the cancer may cause disseminated intravascular coagulation. Bleeding can also be secondary to thrombocytopenia. Thrombocytopenia, or decreased circulating platelets, can result from certain cancer types (e.g., leukemia), cancer treatments (e.g., radiation therapy, chemotherapy), underlying platelet disorders (e.g., idiopathic thrombocytopenia purpura, thrombotic thrombocytopenic purpura), coagulation abnormalities, splenomegaly, and invasion of tumor cells into the bone marrow (Kurtin, 2016).
2. What medications is the patient taking?
Obtain medication history, including over-the-counter medications and herbal remedies. Platelet function can be affected by many drugs, agents, and regimens.
 - a. Common drugs (e.g., aspirin, nonsteroidal anti-inflammatory drugs, thiazide diuretics, tricyclic antidepressants, antibiotics, heparin) (Kurtin, 2016)
 - b. Herbal agents (e.g., garlic, feverfew, ginkgo, ginger, green tea, turmeric) (McEwen, 2015)
 - c. Chemotherapy regimens that include carboplatin, cisplatin, gemcitabine, or temozolomide (Kuter, 2015)
 - d. Biologic agents (e.g., monoclonal antibodies, cytokines) (National Cancer Institute, 2013)
3. Ask the patient to describe symptoms in detail.
 - a. If evident bleeding, is it slow and steady or spurting?
 - b. If evident bleeding from a wound, describe the wound.
 - c. Petechiae, usually seen when platelet count drops below 20,000/mm³ in dependent regions and over bony prominences
 - d. Bruising
 - e. Hemorrhagic vesicles inside the mouth or other mucous membranes

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- f. Hematuria
- g. Gastrointestinal bleeding (e.g., melena, hematemesis)
- h. Mental status changes or headaches
4. Obtain history of the problem.
 - a. Location of bleeding
 - b. Precipitating factors (e.g., injury related, spontaneous)
 - c. Onset and duration: When did bleeding start, and how long has it persisted?
 - d. Estimated amount of blood loss: How many bandages have been used in an hour? If vaginal bleeding, what is the number of feminine pads used per hour?
 - e. Relieving factors: Is bleeding stopped or slowed with direct pressure or other homecare measures?
 - f. Any associated symptoms (e.g., light-headedness, pale skin color, cool or moist skin, thirst, rapid pulse)
5. Review past medical history.
 - a. Use of anticoagulants
 - b. Bleeding disorders
 - c. New drugs used or exposure to toxic chemicals
 - d. Recent invasive procedures
 - e. Recent fall or other injury
6. Assess for changes in activities of daily living and function.

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Penetrating wound with difficulty controlling bleeding • Unconsciousness • Signs of shock <ul style="list-style-type: none"> – Light-headedness – Pale, cold, or moist skin – Thirst – Rapid pulse • Blood spurting from wound and cannot be controlled with direct pressure • Exposed bone or deformity at injury site 	Seek emergency care. Call an ambulance immediately.
<ul style="list-style-type: none"> • Persistent bleeding longer than 10 minutes following direct pressure to wound • Use of one or more feminine pads per hour • Gaping, bleeding wound • History of bleeding disorder or taking anticoagulant with bleeding • Suspected thrombocytopenia with bleeding 	Seek emergency care.
<ul style="list-style-type: none"> • New bruises without significant trauma • Petechial-appearing rash; little red or purple spots on the skin 	Follow homecare instructions. Notify MD if no improvement.
Cross-references: Hematuria, Hemoptysis	

HOMECARE INSTRUCTIONS

(Damron et al., 2009; National Cancer Institute, 2010)

- To control active bleeding
 - Stay calm.
 - If possible, apply direct pressure for at least 10–15 minutes. Maintain pressure until bleeding stops. If bandage is saturated, do not remove; apply additional bandages on top. Try not to dislodge a clot.
 - Lie down and elevate injured part above head (or above heart level).
 - Apply an ice pack, which helps to control bleeding.
- For epistaxis
 - Sit upright.
 - Apply gentle pressure to nares.
 - Apply cold compress.
- To reduce the risk of bleeding due to thrombocytopenia
 - Avoid trauma, contact sports, and falls.
 - Avoid sharp objects and tools.
 - Avoid lifting heavy objects.
 - Avoid intramuscular injections.
 - Avoid medications that contain aspirin or ibuprofen.
 - Avoid dental work, floss, toothpicks, and water picks.
 - Avoid alcoholic beverages.
 - Avoid forceful coughing, sneezing, vomiting, and nose blowing.
 - Avoid constipation and enemas; follow bowel regimen as prescribed by provider to prevent straining.
 - Avoid sex, vaginal douches, or tampons if platelet count is less than 50,000/mm³.
 - Use an electric shaver instead of a razor blade.
 - Use a nail file instead of nail clippers.
 - Use a soft toothbrush.
 - Use moisturizer on skin.

Report the Following Problems

(National Cancer Institute, 2010)

- Blood in urine, vomit, or stool
- Prolonged bleeding or bleeding that does not stop
- Excessive pad count during menstruation
- Swelling or bleeding occurring more than 24 hours after bleeding is under control
- Signs of infection, increased pain, drainage, fever, swelling, pus, streaks, or redness

Seek Emergency Care Immediately if Any of the Following Occurs

- Signs of shock
- Light-headedness
- Visual changes
- Pale, cold, or moist skin
- Excessive thirst

- Rapid pulse
- Uncontrolled bleeding with suspected thrombocytopenia
- Sudden severe headache, mental confusion, or changes in mood

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Victoria Wochna Loerzel, PhD, RN, OCN®

Constipation

PROBLEM

Constipation is defined as a decreased frequency in defecation, difficulty passing hard stools, straining with bowel movements, discomfort with bloating or cramping, or a sensation of incomplete evacuation. It occurs most frequently in older adults and is more common in women. Constipation is a common problem in patients with cancer caused secondary to pressure or blockage by a tumor mass or from the complications of cancer treatment (Thorpe, Byar, Conley, Held-Warmkessel, & Ramsdell, 2017). Constipation in patients with cancer is a common complaint, yet actual incidence frequency is not well documented. The prevalence of constipation in the palliative care population is 40%–64% and can be as high as 70%–100% in hospitalized patients with cancer (Thorpe et al., 2017).

ASSESSMENT CRITERIA

1. What is the cancer diagnosis, and what treatment is the patient receiving?
 - a. Surgical anastomosis may lead to narrowing of the colon lumen from scar tissue or tumor obstruction.
 - b. Recent treatments affecting diet, fluid intake, or mobility can result in constipation. Dietary changes, including a decrease in fluid and fiber or a decrease in mobility and exercise, can contribute to the development of constipation.
 - c. Metabolic changes causing constipation include dehydration, hypokalemia, and hypocalcemia (McMillan, Tofthagen, Small, Karver, & Craig, 2013).
2. What medications is the patient taking?

Obtain medication history, including over-the-counter medications and complementary therapies.

 - a. Constipation is the most common side effect of opioid therapy (Siemens, Gaertner, & Becker, 2015). Opioid-induced constipation results from both organ and cellular effects. Inhibition of propulsion through the gastrointestinal tract, an increase of fluid absorption in the large and small intestines, and an increase in anal sphincter and pyloric tone are all organ effects that can lead to constipation caused by opioids. At a cellular level, opioids bind with receptors in the enteric nervous system, decreasing peristalsis (Nelson & Camilleri, 2016).
 - b. Constipation is a gastrointestinal adverse effect of a number of chemotherapy agents, most commonly alkylating agents (e.g., cisplatin, cyclophosphamide, oxaliplatin), antimetabolites (e.g., 5-fluorouracil, capecitabine, gemcitabine, methotrexate), anthracyclines (e.g., doxorubicin), immuno-

CONSTIPATION

- modulating agents (e.g., thalidomide), mitotic inhibitors (e.g., cabazitaxel, docetaxel, paclitaxel, vincristine), and topoisomerase inhibitors (e.g., irinotecan) (McQuade, Stojanovska, Abalo, Bornstein, & Nurgali, 2016).
- c. Anticholinergic preparations (e.g., gastrointestinal antispasmodics, antiparkinsonian agents, antidepressants) may cause decreased sensitivity to the defecation reflexes and decreased gut motility.
 - d. Antiemetics, such as 5-HT₃ receptor antagonists (e.g., ondansetron, granisetron, palonosetron)
 - e. Phenothiazines
 - f. Calcium- and aluminum-based antacids
 - g. Diuretics
 - h. Tricyclic antidepressants
 - i. Antihypertensive agents
 - j. Nonsteroidal anti-inflammatory drugs
 - k. Vitamin supplements (e.g., iron, calcium)
 - l. Tranquilizers and sleeping medications
 - m. General anesthesia
3. Ask the patient to describe a typical bowel movement.
 - a. Frequency
 - b. Amount and characteristics of stool
 - c. Timing
 4. Ask the patient to describe symptoms in detail.
 - a. Date of last bowel movement
 - b. How does stool differ from normal in size, color, and consistency?
 - c. Was there a distinct odor change?
 - d. Was blood present in the stool?
 - e. Have you had diarrhea?
 - f. Was the stool difficult to pass?
 - g. Were there any associated symptoms (e.g., abdominal or rectal fullness, bloating, nausea, vomiting, excessive gas, pain, cramping)?
 - h. Has there been any perineal or rectal discomfort?
 5. Obtain history of the problem.
 - a. Precipitating factors
 - b. Onset and duration
 - c. Relieving factors
 - i. What have you tried, and what have been the results?
 - ii. What have you done in the past if you experienced constipation, including use of stool softeners, fiber agents, laxatives, enemas, or suppositories? What was the effect?
 6. Assess laboratory values to assist in metabolic evaluation and risk of injury, specifically platelet count.
 7. Review past medical history (e.g., diagnoses, surgeries, treatments).
 8. Assess for changes in activities of daily living and function.
 9. Obtain dietary history.
 - a. Patient diet

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- b. Decrease in food or fluid consumption
- c. Decrease in dietary fiber

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Severe abdominal pain, swelling, or vomiting • Vomiting brown, yellow, or green bitter-tasting emesis • Significant rectal bleeding with no history of hemorrhoids or bleeding with constipation 	Seek emergency care.
<ul style="list-style-type: none"> • No bowel movement in five to seven days, unresponsive to homecare measures • Recent surgery or injury • History of diverticulitis and fever • Fever for 24–48 hours with unknown cause • Inability to pass gas 	Seek urgent care within 24 hours.
<ul style="list-style-type: none"> • Dry, hard stools • Pain with bowel movements • Recent change in stools or bowel habits • Recent change in medications • Recent decrease in activity • Recent decrease in dietary intake (fiber) and fluids 	Follow homecare instructions. Notify MD if no improvement.
Cross-references: Anorexia, Diarrhea	

HOME CARE INSTRUCTIONS

- Assist the patient in finding acute constipation relief, providing guidance for the use of stool softeners and laxatives as recommended by the physician.
- Ongoing prevention of constipation is the goal for homecare instructions to avoid chronic or recurring constipation episodes (Engelking, 2008).
 - Record bowel movements daily, including time of day, description, and amount.
 - Establish a daily exercise routine, including diaphragmatic breathing and abdominal exercises to increase muscle tone.
 - Drink 8–10 glasses of clear liquid daily if not contraindicated; carry a water bottle throughout the day.
 - Include high-fiber foods in the daily diet (e.g., wheat bran, whole grain breads, oatmeal, peanut butter, beans, fruits, vegetables). An increased fiber intake must be accompanied with an increased fluid intake. Be cautious if taking opioids or if a structural blockage is suspected.
 - Establish a regular time for a daily bowel movement. After breakfast is ideal, as this is when contractions in the intestines are the strongest.
 - Drink hot beverages 30 minutes before defecation. Limit caffeinated drinks, as they can act as diuretics.
 - Initiate a prophylactic bowel regimen per provider with chronic opioid use or in chemotherapy regimens with a high incidence of constipation.

- Rectal agents should be avoided in patients with cancer at risk of thrombocytopenia, leukopenia, or mucositis from the cancer or its treatment (National Cancer Institute, 2018; Woolery et al., 2008).

Report the Following Problems

(Engelking, 2008)

- Persistent or worsening constipation
- Ineffective homecare measures
- Abdominal pain or cramping
- Vomiting
- Fever

Seek Emergency Care Immediately if Any of the Following Occurs

- Rectal bleeding
- Passing black-tarry stool
- Severe abdominal pain and swelling
- Vomiting brown, yellow, or green bitter-tasting emesis

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Elizabeth Abernathy, RN, MSN, AOCNS®

Diarrhea

PROBLEM

Diarrhea is an abnormal increase in the quantity, frequency, or liquidity of stool that is different from the usual pattern of elimination. Although no standard definition of diarrhea exists, the National Cancer Institute Cancer Therapy Evaluation Program Common Terminology Criteria for Adverse Events (2017) defines *diarrhea* as “an increase in frequency and/or loose or watery bowel movements” (p. 26). Diarrhea may be accompanied by a sense of bloating, cramping, abdominal pain, or the inability to control defecation. It can negatively affect quality of life and lead to many complications, such as loss of fluids and electrolytes, dehydration, infections, impaired skin integrity, and treatment delays (Muehlbauer et al., 2009).

Diarrhea may be a symptom of cancer, including cancers of the gastrointestinal tract and neuroendocrine tumors, or caused by a chemotherapy regimen, targeted therapy, immunotherapy, radiation therapy, or surgery. The prevalence of treatment-induced diarrhea can be up to 80% (Muehlbauer & Lopez, 2014; Muehlbauer et al., 2009). Other causes include anxiety, medications, and nutritional intake. Diarrhea also can result from bowel disorders, including Crohn disease, irritable bowel syndrome, partial bowel obstruction, and bacterial and viral infections, including *Clostridium difficile* (Muehlbauer & Lopez, 2014; Olsen, LeFebvre, & Brassil, in press).

ASSESSMENT CRITERIA

(Dunphy & Walker, 2017; Muehlbauer & Lopez, 2014; Olsen et al., in press)

1. What is the cancer diagnosis, and what treatment is the patient receiving? Diarrhea is a common side effect of cancer and cancer therapy, including surgery, chemotherapy, targeted therapy, immunotherapy, and radiation therapy. With the advent of newer anticancer therapies, understanding the cause and proper assessment of diarrhea is paramount for appropriate management.
 - a. Chemotherapy and targeted therapy may affect the lining of the intestinal tract and can induce diarrhea. The exact pathophysiology of diarrhea from anticancer agents is often multifaceted and, in some cases, can be unknown (Dunphy & Walker, 2017).
 - b. Gastrointestinal toxicities of immunotherapy can manifest as diarrhea, abdominal pain, or melena. The mechanism for development of diarrhea with immunotherapy is different from the mechanism for chemotherapy or radiation therapy. In severe cases, the patient may develop enterocolitis,

which can be life threatening or require surgical intervention. Ipilimumab has the highest reported prevalence (35%) among current approved therapies. Usual treatment for immunotherapy-related moderate to severe diarrhea is systemic corticosteroids or other immunosuppression agents (Acharya & Jeter, 2013).

- c. Radiation therapy may induce diarrhea when the treatment area includes the pelvis, abdomen, or lower thoracic or lumbar spine. Radiation seed implants for prostate cancer may also cause diarrhea.
 - d. Cancers of the gastrointestinal tract (e.g., stomach, colon, rectum) often cause diarrhea.
 - e. Malignancies, such as neuroendocrine tumors and others that produce hormones, may also cause diarrhea.
2. What medications is the patient taking?
Obtain medication history. Anticancer therapies contributing to diarrhea include IV chemotherapy (e.g., 5-fluorouracil, irinotecan), IV immunotherapy (e.g., interleukin-2, checkpoint inhibitors), and oral therapy (e.g., tyrosine kinase inhibitors, capecitabine). Evaluate for other medications contributing to diarrhea, including antibiotics, laxatives, diuretics, antihypertensives, antiemetics, sorbitol medications (or foods), magnesium-based antacids, and COX-2 inhibitors. If the patient is receiving immune-based therapy, it is imperative to recognize the symptoms of immune-related colitis.
 3. Obtain history of bowel habits.
 - a. Frequency
 - b. Liquid versus formed stool
 - c. Color, odor, and presence of undigested food or fat
 - d. Presence of mucus or blood
 4. Ask the patient to describe symptoms in detail.
 - a. Number of stools in 24 hours
 - b. Color and consistency of stools
 - c. Weight loss
 - d. Urine output and character
 - e. Signs of dehydration (e.g., dry mouth, decreased urine output, lethargy, weakness, decreased skin turgor)
 5. Obtain history of the problem.
 - a. Precipitating factors
 - b. Onset and duration
 - c. Relieving factors
 - i. What remedies has the patient tried, and what have been the results?
 - ii. What has the patient done in the past for diarrhea management, and what was the effect?
 - d. Any associated symptoms (e.g., abdominal pain or cramps, fever, weight loss, stool incontinence, nausea or vomiting, decreased urine output)
 6. Review past medical history.
 7. Assess for changes in activities of daily living and function.

DIARRHEA

8. Obtain diet history.
 - a. Food intolerance
 - b. Aversions
 - c. Allergies
 - d. Consumption of well water
 - e. Ingestion of unpasteurized milk or its products
 - f. Consumption of raw seafood
9. Assess social history.
 - a. Recent travel abroad
 - b. Exposure to farm animals or animal feces

Signs and Symptoms	Action
<ul style="list-style-type: none"> Grossly bloody stool Signs of severe dehydration <ul style="list-style-type: none"> Severe lethargy or weakness Heart palpitations Decreased urine output Sunken eyes Orthostatic hypotension Dizziness Temperature higher than 100.4°F (38°C) with suspected neutropenia Symptoms of immune-mediated colitis, such as diarrhea accompanied by blood in stool, severe abdominal pain, or tenderness Symptoms of bowel perforation, such as diarrhea associated with severe abdominal pain, fever, chills, nausea, and vomiting 	<p>Seek emergency care. Call an ambulance immediately.</p>
<ul style="list-style-type: none"> Excessive thirst, dry mouth Temperature higher than 100.4°F (38°C) without suspected neutropenia Diarrhea for more than five days More than four to six stools above baseline per day for two days Swollen or painful abdomen More than 10 stools per day Weight loss of more than five pounds since diarrhea began Continued diarrhea despite antidiarrheal treatment Decreased turgor; pinched skin does not spring back Grade 3 or 4 nausea and vomiting 	<p>Seek urgent care within 24 hours.</p>
<ul style="list-style-type: none"> Less than four stools per day Chronic diarrhea Other family members with diarrhea Recent travel to a foreign country New prescription 	<p>Follow homecare instructions. Notify MD if no improvement.</p>
<p><i>Cross-references: Nausea and Vomiting, Pain</i></p> <p><i>Note.</i> Based on information from Dunphy & Walker, 2017; Fay et al., 2016; MedlinePlus, 2016; Muehlbauer & Lopez, 2014; Olsen et al., in press.</p>	

HEMOCARE INSTRUCTIONS

(Dunphy & Walker, 2017; Muehlbauer & Lopez, 2014; Olsen et al., in press; Shaw & Taylor, 2012)

- Consider food and fluid modifications.
 - Drink 8–10 eight-ounce glasses of fluids per day (e.g., water, diluted cranberry juice, sports drinks, decaffeinated tea or coffee).
 - Eat foods high in soluble fiber (e.g., bananas, oatmeal, applesauce, skinned turkey, chicken, rice, toast).
 - Consider foods containing pectin, a natural fiber that decreases diarrhea. These foods include beets, peeled apples, white rice, bananas, baked potatoes without skin, white bread, plain pasta, avocados, and asparagus tips.
 - Eat easy-to-digest foods high in protein, calories, and potassium.
 - Cook all vegetables well. Raw vegetables are difficult to digest.
 - Eat small, frequent meals. Do not eat large meals.
 - Eat foods at room temperature, as hot and cold temperature foods may instigate diarrhea.
 - Avoid foods high in insoluble fiber (e.g., raw fruits and vegetables, skins, seeds, legumes).
 - Avoid milk and dairy products, caffeine, alcohol, sucrose, and sorbitol.
 - Avoid greasy, fatty, spicy, or fried foods and foods containing olestra.
 - Refrain from taking fiber supplements.
- Implement a rectal skin care routine.
 - Clean the perineal area well with mild soap and water or aloe-based baby wipes. Apply barrier ointment (e.g., zinc oxide) for protection.
 - Sitz baths may add comfort.
 - Examine the rectal area for red, scaly, or broken skin. If this is present, report it to the healthcare provider.
 - Record the frequency, quality, and volume of stools during the course of treatment.
- If diarrhea lasts more than 24 hours, notify the healthcare provider.
 - Consult a healthcare provider before taking any over-the-counter antidiarrheal medications. These can be very effective but may not be appropriate for this situation. If treatment with immunotherapy or targeted therapies has been prescribed, consultation with the healthcare team should begin prior to starting antidiarrheal.
 - If prescribed, keep track of medications administered—type, amount, and frequency.

Report the Following Problems

(Muehlbauer & Lopez, 2014; Olsen et al., in press)

- Inability to keep fluids down for 24 hours
- Diarrhea lasting more than 24 hours
- Dark yellow urine or absence of urine production
- More than four to six bowel movements above baseline per day for two days in a row

- Grade 2 or greater nausea and vomiting that accompanies diarrhea
- Dizziness
- Rectal bleeding
- Temperature higher than 100.4°F (38°C)
- Swollen or painful abdomen
- Red, scaly, or broken skin of the rectal area

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Kerri A. Dalton, MSN, RN, AOCNS®

Difficulty or Pain With Urination

PROBLEM

Burning or pain with urination can be coupled with an urgent need to urinate. Frequency of urination can also coexist. Hemorrhage or clot formation can complicate the process of urination, resulting in pain or dysuria. Difficulty or pain with urination can be the result of disease, treatment sequelae, or infectious processes, and thus should always be evaluated (Cisneros & Lazarte, 2015; Das, 2017; Mutale, 2014; Wiser, 2017; Yarbrow & Berry, 2014).

ASSESSMENT CRITERIA

(Conde & Workman, 2017; Shelton, 2018; Tyler & Profusek, 2018; Webster, 2017; Yarbrow & Berry, 2014)

1. What is the cancer diagnosis, and what treatment is the patient receiving?
Multiple causes of painful or difficult urination exist, including those from the cancer itself, cancer treatment, and from infectious or inflammatory processes.
 - a. Urinary tract infection is a common cause of difficult or painful urination and should be high on the differential for these patient complaints.
 - b. Bladder cancer treatment with bacillus Calmette-Guérin may result in urinary frequency, urgency, and pain.
 - c. Hemorrhagic cystitis may result from chemotherapy treatments such as ifosfamide and cyclophosphamide.
 - d. Sequelae from radiation therapy, such as for prostate cancer or gynecologic pelvic radiation can cause cystitis- or urinary tract infection-type side effects that present with frequency, urgency, or dysuria.
 - e. Sequelae from surgical or invasive procedures involving the genitourinary tract, including but not limited to the kidney, prostate, bladder, and urethra, can contribute to painful or difficult urination.
 - f. Urinary retention can result from spinal cord injury as a result of bone metastasis or tumor extension, such as with spinal cord compression.
2. What medications is the patient taking?
 - a. Obtain medication history, including recent prescription and over-the-counter medications (e.g., anticoagulants, aspirin, nonsteroidal anti-inflammatory drugs, alternative or complementary therapies).
 - b. Review recent chemotherapies, including agents used, routes, doses, and timing of last dose.
 - c. Discuss radiation therapy or other interventions that could affect urinary output.

DIFFICULTY OR PAIN WITH URINATION

- d. Alpha-adrenergic, anticholinergic, pseudoephedrine, and phenylpropanolamine medications may cause difficulty in urination and urinary retention (Mutale, 2014; Webster, 2017; Yarbrow & Berry, 2014).
3. Consider how well the patient has been hydrated.
 - a. Have the patient recall fluid intake over the past 24–48 hours.
 - b. Ask about gastrointestinal complaints such as diarrhea or nausea and vomiting.
 - c. Question whether the patient has been light-headed or dizzy (Shelton, 2018; Yarbrow & Berry, 2014).
4. Is the patient pregnant?
 - a. Discuss patient presentation of symptoms as they relate to pregnancy and sexual health.
 - b. Determine contraceptive use.
 - c. Consider sexual activity and trauma (Mutale, 2014).
5. Ask the patient to describe symptoms in detail.
 - a. Discomfort or pain on urination, including before starting a stream and after completed (burning, hot, electric)
 - b. Frequency of urination over the past 24–48 hours
 - c. A feeling that the bladder is not fully emptying
 - d. Time of last urination
 - e. Color of urine, including any visible blood, mucus, or sediment
 - f. Odor of urine
 - g. Any discharge from genitourinary structures
 - h. Any fevers or chills (Conde & Workman, 2017; McCurdy & Bryant, 2017; Mutale, 2014; Shelton, 2014; Yarbrow & Berry, 2014)
6. Obtain history of the problem.
 - a. Precipitating factors: If known, encourage reflection on recent events.
 - b. Onset and duration
 - c. Relieving factors
 - d. Smoking or alcohol intake
 - e. Ability to start and end urine stream
 - f. Presence or absence of lower back pain
 - g. Any associated symptoms (e.g., blood, discharge, fever) (Cisneros & Lazarte, 2015; Das, 2017; Mutale, 2014; Wiser, 2017; Yarbrow & Berry, 2014)
7. Review past medical history (Das, 2017; Mutale, 2014; Shelton, 2018; Wiser, 2017; Yarbrow & Berry, 2014).
 - a. Cancer and cancer treatment history: Discuss recent and prior history.
 - b. Recent urinary catheterization, interventions, or trauma
 - c. Urinary tract infections and outcomes or sequelae, if known
 - d. Sexual history (date of last intercourse; protected or unprotected; sexually transmitted infections or sexual trauma)
 - e. Nonmalignant genitourinary history
8. Assess for changes in activities of daily living and function.

DIFFICULTY OR PAIN WITH URINATION

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Urinary retention • Acute severe flank or back pain • Lower extremity weakness • Temperature higher than 101.5°F (38.6°C) without suspected neutropenia • Temperature higher than 100.4°F (38°C) with suspected neutropenia • Chills, malaise, or rigors 	Seek emergency care. Call an ambulance immediately.
<ul style="list-style-type: none"> • Hematuria • Dysuria • Burning with urination • Frequent urination, nocturia • Cloudy or malodorous urine or discharge • Suprapubic pain or tenderness • Unable to urinate for more than eight hours • Flu-like symptoms for longer than 72 hours • Joint pain, cough, or rash after bacillus Calmette-Guérin treatment 	Seek urgent care within 24 hours.
<ul style="list-style-type: none"> • If the patient has received recent bacillus Calmette-Guérin treatment <ul style="list-style-type: none"> – Dysuria, burning, or difficulty urinating – Frequent urination, nocturia – Sense of incomplete voiding – Slow stream, dribbling 	Follow homecare instructions. Notify MD if no improvement.
<p><i>Cross-references: Fever With Neutropenia, Hematuria</i></p> <p><i>Note.</i> Based on information from Das, 2017; Mutale, 2014; Shelton, 2018; Webster, 2017; Wiser, 2017; Yarbrow & Berry, 2014.</p>	

HOMECARE INSTRUCTIONS

(Cisneros & Lazarte, 2015; Das, 2017; Shelton, 2018; Wiser, 2017; Yarbrow & Berry, 2014)

- Drink 8–10 eight-ounce glasses of fluid each day (unless contraindicated). Alcohol is not included in hydration amounts; remember to report consumption to clinician.
- Cranberry juice may reduce bacterial adherence to bladder wall.
- Avoid caffeinated and acidic beverages, as they can be irritants or stimulants.
- Females should cleanse the genital area from front to back.
- Avoid urinary stasis by urinating frequently.
- Postcoital urination is suggested.
- Take showers instead of tub baths to decrease infection risk.
- Monitor urinary output.
- Practice pelvic floor exercises.
- Use of a voiding diary may be helpful.

Seek Emergency Care Immediately if Any of the Following Occurs

(Das, 2017; Webster, 2017; Wisner, 2017; Yarbro & Berry, 2014)

- Shortness of breath or difficulty breathing
- Loss of consciousness, unresponsiveness, or changes in cognition
- Temperature elevation that persists 48–72 hours after initiation of treatment
- Development of fever, chills, or rigors
- Inability to pass urine

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Gary Shelton, DNP, NP, ANP-BC, AOCNP®, ACHPN

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Fatigue

PROBLEM

Cancer-related fatigue (CRF) is defined by the National Comprehensive Cancer Network® (NCCN®, 2018) as a “distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning” (p. FT-1). Perceived by patients as the most distressing cancer-associated symptom, CRF negatively affects function and quality of life across the cancer continuum. The etiology of CRF is not clear; however, research suggests that interconnected biologic alterations involving elevation in proinflammatory cytokines, dysregulation of 5-hydroxytryptophan, hypothalamic-pituitary-adrenal axis dysfunction, circadian rhythm disturbances, and increased vagal tone may be contributing factors. Often, fatigue experienced by patients with cancer and survivors has many causal factors. Thus, it is important to evaluate all potential factors that could contribute to CRF. Every patient should be screened for CRF at the initial visit and regularly during and following treatment. Management strategies must be tailored to the individual (Berger, Mitchell, Jacobsen, & Pirl, 2015; Mitchell et al., 2014; NCCN, 2018).

ASSESSMENT CRITERIA

(Berger et al., 2015; Erickson, Spurlock, Kramer, & Davis, 2013; Kolak et al., 2017; Mitchell et al., 2014)

1. What is the cancer diagnosis, and what treatment is the patient receiving?
 - a. Fatigue is a common and persistent symptom, from diagnosis through survivorship.
 - b. CRF may be more pronounced in recurrent, advanced disease or at the end of life.
 - c. Chemotherapy: Fatigue is almost universal and frequently reported at nadir.
 - d. Radiation therapy: Cumulative fatigue peaks around the fifth week of treatment and decreases about two months after the end of treatment. About 30% of patients develop chronic fatigue.
 - e. Concurrent chemoradiation: Fatigue incidence is higher than single-modality treatment.
 - f. Bone marrow/stem cell transplant: Fatigue can persist up to one year post-transplant.
 - g. Biologic therapy: flu-like symptoms, including fatigue
 - h. Those most likely to report moderate to severe fatigue are on active treatment with poor performance status, have experienced weight loss of greater than 5% within six months, and use opioids.

2. What medications is the patient taking?
Obtain medication history, including over-the-counter medications, herbals, vitamins, and supplements. Polypharmacy may compound CRF.
 - a. Have there been any recent medication changes or additions?
 - b. Polypharmacy (four or more medications) or the combination of drug classes may increase CRF (e.g., narcotics, antiemetics, antidepressants, antihistamines).
 - c. Many drugs have sedative side effects.
 - i. Opioids
 - ii. Secobarbital
 - iii. Benzodiazepines
 - iv. Antianxiety (anxiolytic)
 - v. Anticonvulsants
 - vi. Antihistamines
 - vii. Beta-blockers (bradycardia)
3. Obtain history of the problem.
 - a. Severity (on a 0–10 numeric scale): 0 = no fatigue; 1–3 = mild fatigue; 4–6 = moderate fatigue; 7–9 = severe fatigue; 10 = worst fatigue imaginable (Berger et al., 2015)
 - b. Onset and duration
 - i. When did fatigue begin?
 - ii. How often did you experience it in the past week?
 - iii. How many hours per day are you fatigued?
 - c. Relieving and intensifying factors
 - i. What makes the fatigue better or worse?
 - ii. Is it relieved by rest?
 - iii. Do you have trouble sleeping?
 - iv. Do you experience daytime sleepiness?
 - v. Do you experience sadness, discouragement, anxiety, or boredom?
 - d. Interference with function
 - i. Do you have difficulty accomplishing tasks?
 - ii. Has fatigue interfered with your social life?
 - iii. Do you have difficulty fulfilling responsibilities at home or work?
 - e. Any associated symptoms (Mitchell, 2018; NCCN, 2018)
 - i. Pain
 - ii. Fever, infection
 - iii. Cognitive dysfunction or decreased mental concentration
 - iv. Sleep disturbances (e.g., sleep apnea, restless legs syndrome, insomnia)
 - v. Nausea, vomiting, or diarrhea
 - vi. Difficulty breathing
 - vii. Muscle weakness
4. Review past medical history (Mitchell, 2018; NCCN, 2018).
 - a. Pain

- b. Anemia
 - c. Infection
 - d. Endocrine dysfunctions (e.g., hot flashes, hypothyroidism, hypogonadism, adrenal insufficiency)
 - e. Cardiopulmonary dysfunction
 - f. Renal, hepatic, or neurologic dysfunction
 - g. Hepatic disease
 - h. Gastrointestinal disease/dysfunction
 - i. Alcohol or substance abuse
 - j. Emotional distress, depression, or anxiety
 - k. Sleep disturbances
 - l. Nutritional deficit or imbalance
5. Assess for changes in activities of daily living and function.

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Unable to wake up 	<p>Seek emergency care. Call an ambulance immediately.</p>
<ul style="list-style-type: none"> • Severe fatigue that is disabling; patient is bedridden. • Temperature higher than 100.4°F (38°C) with suspected neutropenia • Adverse reaction to psychostimulant (e.g., methylphenidate, modafinil, prednisone, dexamethasone) 	<p>Seek emergency care.</p>
<ul style="list-style-type: none"> • Severe fatigue or loss of ability to perform some activities • Dizziness • Temperature higher than 100.4°F (38°C) without suspected neutropenia 	<p>Schedule office visit in 24–48 hours.</p>
<ul style="list-style-type: none"> • Moderate fatigue or difficulty performing some activities of daily living 	<p>Follow homecare instructions. Notify MD if no improvement.</p>
<ul style="list-style-type: none"> • Increased fatigue over baseline but not altering daily lifestyle 	<p>Follow homecare instructions. Notify MD if no improvement.</p>
<p><i>Cross-references: Fever With Neutropenia, Fever Without Neutropenia</i></p> <p><i>Note.</i> Based on information from Erickson et al., 2013; Mitchell, 2018; National Comprehensive Cancer Network, 2018.</p>	

HOME CARE INSTRUCTIONS

(Erickson et al., 2013; Mitchell, 2018; Mitchell et al., 2014; NCCN, 2018)

- Participate in the appropriate and optimal physical activity/exercise for the individual.
 - Start slowly (e.g., walking, gentle stretching, yoga).
 - Try short periods of exercise with frequent rest breaks.
 - Avoid uneven surfaces.

- Avoid activity that puts you at risk for falls or injury.
- Aim for daily physical activity.
- If able, include endurance activities (e.g., walking, swimming, cycling) and resistance training (e.g., weights, resistance bands).
- Seek a physical therapist or exercise specialist for assessment and an exercise prescription.
- Exercise is recommended with caution in patients with the following:
 - Bone metastases
 - Thrombocytopenia
 - Anemia
 - Fever or active infection
 - Physical limitations secondary to metastases or comorbid conditions
 - Safety issues (risk of falls)
- Manage stress through various means.
 - In-person or online support groups
 - Expressive writing, journaling
 - Supportive counseling
 - Relaxation breathing
 - Progressive muscle relaxation
 - Mindfulness-based stress reduction
 - Meditation
- Practice energy conservation.
 - Prioritize important tasks and eliminate or delegate others.
 - Keep frequently used items within reach.
 - Do not stand too long. Sit when preparing meals, washing dishes, ironing, etc.
 - Alternate periods of activity and rest throughout the day.
 - Plan ahead, as rushing uses energy.
 - Keep an activity journal for a few weeks to identify patterns of energy and fatigue.
 - Use adaptive devices such as a jar opener, reaching or grabbing tool, shower chair, or bedside commode.
- Optimize sleep quality.
 - Cognitive behavioral therapy can address negative thought patterns and behaviors that interfere with sleep.
 - Sleep restriction: Match the time in bed with sleep requirements.
 - Avoid caffeine at least six to eight hours before bedtime.
 - Stop smoking.
 - Avoid alcohol and high-sugar foods in the evening.
 - Use the bedroom only for sleep and sex.
 - Limit daytime naps to 30 minutes.
 - Establish a routine prior to sleep that promotes relaxation.
 - Create a conducive sleep environment (dark, quiet, and comfortable).
 - Avoid gaming, watching TV, and using a computer or cell phone late at night.
 - Encourage a balanced diet and adequate intake of fluids, electrolytes, calories, protein, carbohydrates, fat, vitamins, and minerals.

Report the Following Problems

- Blood in urine or stool
- Weight loss
- Fever (temperature above the normal or baseline temperature) without neutropenia
- Inability to perform activities of daily living
- Inability to conceptualize thoughts

Seek Emergency Care Immediately if Any of the Following Occurs

- Fainting
- Unconsciousness
- Temperature higher than 100.4°F (38°C) with suspected neutropenia

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Pamela H. Carney, MSN, RN, OCN®

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Fever With Neutropenia

PROBLEM

When taken using an oral thermometer, normal body temperature is 98.6°F (37°C). Fever in a neutropenic patient is defined as a sustained oral temperature higher than 100.4°F (38°C) for more than one hour or a single temperature higher than 101°F (38.3°C). Febrile neutropenia is considered a medical emergency, as it can be a potentially life-threatening event and lead to cancer treatment delays and dose reductions (Kurtin, 2016).

Up to 60% of patients who become febrile have an established infection (National Comprehensive Cancer Network® [NCCN®], 2017). A neutropenic patient cannot mount a normal response to infection, and fever is often a late sign of an infectious process and may be life threatening (O’Leary, 2015). Rosa and Goldani (2014) recommended that the target time for the initiation of antibiotics should be 30 minutes from the onset of a fever in a neutropenic patient. They also found that mortality rate increased by 18% for each hour the initiation of antibiotics was delayed.

ASSESSMENT CRITERIA

1. What is the cancer diagnosis, and what treatment is the patient receiving?
The risk of infection is directly related to the severity and duration of neutropenia (NCCN, 2017). Other risk factors include age 65 or older, female sex, malnutrition, and comorbidities (e.g., chronic obstructive pulmonary disease, diabetes, renal or liver disease). Neutropenia can occur secondary to malignancies that involve bone marrow infiltration, such as leukemia, and to chemotherapy or radiation therapy (Kurtin, 2016).
2. What medications is the patient taking?
Obtain medication history.
 - a. Include a history on current cancer treatments, both immunosuppressive agents such as cytotoxic therapies, which could lead to neutropenia resulting in an increase in risk for infection, and other treatments that may result in fever as a side effect, such as BRAF inhibitors and immunotherapy agents.
 - b. Inquire about current or recent use of corticosteroids. Long-term corticosteroid use may lower the resistance to infection. Rapid cessation of steroids taken for longer than two weeks may lead to steroid withdrawal syndrome, which may include fever, fatigue, joint pain, muscle stiffness, or tenderness (Fields, 2017).
3. Ask the patient to describe symptoms in detail.
 - a. Maximum temperature in the past 24 hours

FEVER WITH NEUTROPENIA

- b. Evidence of any other signs of infection (Kurtin, 2016)
 - i. Red, draining, or tender lesions/sores
 - ii. Mucositis or white patches in the oral cavity
 - iii. Diarrhea
 - iv. Red, draining, or tender indwelling catheter exit site
 - v. Sore throat
 - vi. Cough
 - vii. Pain or discomfort with urination
 - viii. Chills
4. Obtain history of the problem.
 - a. Precipitating factors (e.g., exposure to others with infections, especially tuberculosis; pets; travel; recent blood product administration) (NCCN, 2017)
 - b. Onset and duration, including temperature spikes and time of temperature elevation
 - c. Relieving factors (e.g., any antipyretic medications taken prior to the call)
5. Review past medical history.
 - a. Exposure to others with upper respiratory infection or flu
 - b. The most common cause of neutropenia is chemotherapy, and the timing of neutrophil nadir is predictable and can be estimated based on the agent given.
 - i. Always identify the chemotherapy agents given and when.
 - ii. Review the patient's latest complete blood count and absolute neutrophil counts, as well as prior counts of both during other chemotherapy cycles. This helps to predict the degree of neutropenia, as it typically worsens with each course of therapy if not treated with a growth factor.
 - c. Infection history and recent antibiotics taken (Kurtin, 2016)
6. Assess for changes in activities of daily living and function.

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Temperature higher than 100.4°F (38°C) for more than an hour or a single temperature spike of 101°F (38.3°C) combined with one of the following: <ul style="list-style-type: none"> – Change in mental status: restlessness, irritability, confusion, or somnolence – Rapid breathing, difficulty swallowing, or wheezing – Signs of dehydration <ul style="list-style-type: none"> * Decreased urine output * Sunken eyes * Excessive thirst, dry mouth * Pinched skin does not spring back – Signs of shock <ul style="list-style-type: none"> * Light-headedness * Pale, cold, or moist skin * Thirst * Rapid pulse 	<p>Seek emergency care. Call an ambulance immediately.</p>

(Continued on next page)

FEVER WITH NEUTROPENIA

(Continued)

Signs and Symptoms	Action
<ul style="list-style-type: none">• Signs and symptoms of infection• Temperature 100.4°F (38°C) or lower	<p>Seek urgent care within 24 hours.</p> <p>Follow homecare instructions. Notify MD if no improvement.</p>
<i>Cross-references: Difficulty or Pain With Urination, Fever Without Neutropenia, Oral Mucositis</i>	

HOME CARE INSTRUCTIONS

- Take temperature anytime you feel hot or chilled, and repeat every four hours.
- Follow neutropenic precautions if absolute neutrophil count is less than 1,000/mm³.
- Avoid antipyretic medications when neutropenia is present to avoid masking symptoms of infection and sepsis.

Neutropenic Precautions

(Kurtin, 2016; National Cancer Institute, 2015; Olsen, LeFebvre, & Brassil, in press)

- Maintain good personal hygiene, including washing hands after using the bathroom.
- Practice preventive oral care, including brushing teeth with a soft toothbrush twice daily and flossing daily. Use an oral rinse with salt water after each meal.
- Avoid crowds and exposure to anyone with signs of infection.
- Do not change cat litter or clean up animal excreta.
- Use nothing per rectum.
- Use daily stool softeners to avoid constipation.

Report the Following Problems

- Sustained oral temperatures higher than 100.4°F (38°C) for more than one hour or a single temperature higher than 101°F (38.3°C)
- Chills with or without fever
- New cough with or without sputum or worsening cough
- Burning on urination
- Pain at site of port or catheter
- New sore throat or mouth
- Any area with redness or swelling

Seek Emergency Care Immediately if Any of the Following Occurs

- Sustained oral temperatures higher than 100.4°F (38°C) for more than one hour or a single temperature higher than 101°F (38.3°C)
- Changes to level of consciousness
- Shortness of breath
- Signs of shock

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Victoria Wochna Loerzel, PhD, RN, OCN®

Fever Without Neutropenia

PROBLEM

Fever is a body temperature of 100.5°F (38.1°C) or higher (oral temperature) that most often will fluctuate over the course of a day. Fever is most commonly caused by an infection, but other causes can include inflammatory conditions, drug reactions, or tumor growth. Sometimes, the cause may not be known (American Cancer Society, 2015).

ASSESSMENT CRITERIA

1. What is the cancer diagnosis, and what treatment is the patient receiving?
 - a. Fever can be an adverse event associated with cancer treatments, including chemotherapy, immunotherapy, biologic therapy, and some targeted therapies, such as BRAF and MEK inhibitors. Biologic therapy– and immunotherapy-induced fevers are often associated with a flu-like syndrome, which can include rigors, fatigue, myalgia, and nausea and vomiting.
 - b. Fever can result from an infection.
 - c. Some cancers, such as leukemia and lymphoma, are often associated with fever (American Cancer Society, 2014).
 - d. It is important to rule out the presence of neutropenia in the patient. If the patient is currently receiving cancer therapy or is diagnosed with leukemia, suspect neutropenia and follow the protocol for *Fever With Neutropenia*, as a low-grade fever can be a medical emergency.
2. What medications is the patient taking?

Obtain medication history.

 - a. Chemotherapy: Fever may be a result of a drug reaction at the time of infusion or in the 72 hours following infusion with paclitaxel, docetaxel anhydrous, and gemcitabine (Ogawara et al., 2016).
 - b. Biologic therapy (e.g., interferons, interleukins, colony-stimulating/growth factors, vaccines, gene therapies, nonspecific immunomodulation agents) (Keith & Abueg, 2016; Olsen, LeFebvre, & Brassil, in press)
 - c. Targeted therapy (e.g., small molecule inhibitors [BRAF and MEK inhibitors], monoclonal antibodies) (National Cancer Institute, 2014; Olsen et al., in press; Welsh & Corrie, 2015)
 - d. Inquire about current or recent use of corticosteroids. Long-term corticosteroid use may lower the resistance to infection. Rapid cessation of steroids taken for longer than two weeks may lead to steroid withdrawal syndrome, which may include fever, fatigue, joint pain, muscle stiffness, or tenderness (Fields, 2017).

FEVER WITHOUT NEUTROPENIA

3. Ask the patient to describe symptoms in detail.
 - a. Maximum temperature in the past 24 hours
 - b. Evidence of any other signs of infection (Kurtin, 2016)
 - i. Red, draining, or tender lesions/sores
 - ii. Mucositis or white patches in the oral cavity
 - iii. Diarrhea
 - iv. Red, draining, or tender indwelling catheter exit site
 - v. Sore throat
 - vi. Cough
 - vii. Pain or discomfort with urination
 - viii. Chills
4. Obtain history of the problem.
 - a. Precipitating factors
 - b. Onset and duration, including temperature spikes and time of temperature elevation
 - c. Relieving factors (e.g., any antipyretic medications taken prior to the call)
5. Review past medical history.
 - a. Chronic medical conditions that increase susceptibility to infections (e.g., HIV, diabetes mellitus, autoimmune disease)
 - b. Recent exposure to others with upper respiratory infection or flu
 - c. Recent medical procedures or surgeries
6. Assess for changes in activities of daily living and function.

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Change in mental status: restlessness, irritability, confusion, or somnolence • Signs of dehydration in an older adult or immunocompromised individual <ul style="list-style-type: none"> – Decreased urine output – Sunken eyes – Excessive thirst, dry mouth – Pinched skin does not spring back • Signs of shock <ul style="list-style-type: none"> – Light-headedness – Pale, cold, or moist skin – Thirst – Rapid pulse • Temperature higher than 103°F (39.4°C) and unresponsive to fever-reducing measures • Rapid breathing, difficulty swallowing, or wheezing • Headache, neck stiffness, or photophobia • Temperature higher than 101°F (38.3°C) in a high-risk patient, such as patients with HIV, leukemia, or those using steroids • Fever that persists longer than 72 hours with no known cause 	<p>Seek emergency care. Call an ambulance immediately.</p> <p>Seek urgent care within 24 hours.</p>

(Continued on next page)

FEVER WITHOUT NEUTROPENIA

(Continued)

Signs and Symptoms	Action
<ul style="list-style-type: none">• Shortness of breath• Cough with green or yellow sputum• Frequent or painful urination• Rash• Earache, sore throat, or swollen glands• Recent surgical procedure	Seek urgent care within 24 hours.
<ul style="list-style-type: none">• Congestion, sneezing, and body aches• Illness in other family members• Fever responsive to self-care measures	Follow homecare instructions. Notify MD if no improvement.
<i>Cross-references: Difficulty or Pain With Urination, Fever With Neutropenia, Oral Mucositis</i>	

HOMECARE INSTRUCTIONS

- Increase fluid intake (unless contraindicated).
- Rest.
- Take usual medications for fever and aches (acetaminophen or ibuprofen), following instructions on label.
- Take a lukewarm sponge bath or bath soak; do NOT use alcohol rubs or alcohol in water soaks as it causes increased discomfort.
- Check temperature every two to four hours or following chills. If no improvement, notify physician.

Report the Following Problems

- Temperature higher than 103°F (39.4°C)
- Fever that persists for more than 24 hours with no known cause
- Rash
- Frequent urination, blood, or pain with urination
- Signs of dehydration
- Abdominal pain

Seek Emergency Care Immediately if Any of the Following Occurs

- Seizure
- Change in level of consciousness
- Difficulty breathing
- Signs of shock

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Victoria Wochna Loerzel, PhD, RN, OCN®

Nausea and Vomiting

PROBLEM

Nausea is “the subjective phenomenon of an unpleasant, wavelike sensation experienced in the back of the throat and/or the epigastrium that may culminate in vomiting (emesis)” (National Cancer Institute, 2017c, para. 1). Vomiting is “the forceful expulsion of the contents of the stomach, duodenum, or jejunum through the oral cavity” (National Cancer Institute, 2017c, para. 1). Vomiting is often preceded by nausea, tachycardia (irregular heartbeat), diaphoresis, dizziness, and retching. Retching, or dry heaves, is gastric and esophageal vomiting motions without expulsion of emesis (National Cancer Institute, 2017b). The incidence and severity of chemotherapy-induced nausea and vomiting are affected by the emetogenicity of the chemotherapy agents used, the schedule and route of administration, and individual patient variability (Lee et al., 2017).

Chemotherapy-induced nausea and vomiting results in serious malnutrition. A study by Davidson et al. (2012) reported that 26% of patients receiving chemotherapy in an ambulatory setting were malnourished, with a majority reporting limited dietary intake.

PATTERNS OF NAUSEA AND VOMITING

- Acute: experienced during the first 24 hours after chemotherapy administration
- Delayed (late): occurs more than 24 hours after chemotherapy administration and is associated with cisplatin, cyclophosphamide, and other drugs (e.g., doxorubicin, ifosfamide) given at high doses or for two or more consecutive days
- Anticipatory: occurs before a new cycle of chemotherapy is begun, in response to conditioned stimuli, such as the smells, sights, and sounds of the treatment room. It is a classically conditioned response that typically occurs three or four chemotherapy treatments after the patient experiences acute or delayed nausea and vomiting; however, it can occur at any time.
- Breakthrough: occurs within five days of prophylactic use of antiemetics and requires rescue
- Refractory: does not respond to treatment
- Chronic: occurs in patients with advanced cancer and is associated with a variety of potential etiologies. A definitive understanding of cause is neither well known nor well researched, but potential causal factors include gastrointestinal, cranial, metabolic, drug-induced (e.g., morphine), cytotoxic chemotherapy-induced, and radiation-induced mechanisms (National Cancer Institute, 2017b).

After the specific patterns of nausea and vomiting are established, an assessment is necessary to chronicle evaluation of the onset, intensity, and relationship to chemotherapy.

ASSESSMENT CRITERIA FOR NAUSEA

1. What is the cancer diagnosis, and what treatment is the patient receiving?
 - a. When did the patient receive the last chemotherapy treatment or undergo a transplant?
 - b. What chemotherapy did the patient receive?
2. What medications is the patient taking?
 - a. Is the patient taking an opioid or any new medication (Nolan, Daly, & Rowan, 2012)?
 - b. Obtain information on current use of antiemetics.
3. Ask the patient to describe symptoms in detail.
4. Obtain history of the problem.
 - a. Severity
 - b. Precipitating factors
 - c. Onset and duration
 - d. Relieving factors
 - e. Nonpharmacologic interventions and their effectiveness
 - f. Food and fluid intake over the past 24 hours
 - g. Any associated symptoms (e.g., indications of disease recurrence)
5. Review past medical history.

ASSESSMENT CRITERIA FOR VOMITING

(Nolan et al., 2012)

1. What is the cancer diagnosis, and what treatment is the patient receiving?
 - a. Is the patient post-transplant? If yes, discuss with hematologist or clinical nurse specialist.
 - b. Is the patient taking oral chemotherapy?
2. What medications is the patient taking?
Obtain information on current use of antiemetics.
3. Ask the patient to describe symptoms in detail.
 - a. Character, color, force, and quantity of vomit
 - b. Are other members of the family/household experiencing the same symptoms?
 - c. Diarrhea or constipation
 - d. Abdominal distension
4. Obtain history of the problem.
 - a. Severity
 - b. Precipitating factors

- c. Onset and duration
 - d. Relieving factors
 - e. Nonpharmacologic interventions and their effectiveness
 - f. Food and fluid intake over the past 24 hours
 - g. Any associated symptoms, such as signs of dehydration (e.g., decreased urine output, fever, thirst, dry mucous membranes, weakness, dizziness, confusion)
5. Review past medical history.

HOME CARE INSTRUCTIONS

- Review with healthcare provider the prescribed antiemetic therapy, dose schedule, and route.
- Correctly and regularly comply with prescribed medication.
- Take frequent small sips of fluids.
- Eat small amounts of food frequently.
- Supplement diet with ginger or foods containing ginger.
- Take an antiemetic 20 minutes prior to meals.
- Monitor for signs of dehydration.
- Use distraction therapies (e.g., music, moderate exercise, relaxation, breathing exercises) in addition to antiemetic therapy.
- Contact a healthcare provider during clinic hours if symptoms persist or become worse. If the patient is compliant with the antiemetic medication, contact the healthcare provider to receive an alternative antiemetic prescription (Nolan et al., 2012).
- The U.S. Food and Drug Administration has not approved the use of cannabis as a treatment for any medical conditions to date (National Cancer Institute, 2017a). The potential benefits of medical cannabis for people living with cancer include antiemetic effects, appetite stimulation, pain relief, and sleep improvements (Abrams, 2016). Further research is needed before cannabis can become a part of evidence-based oncology practice (Turgeman & Bar-Sela, 2017).

Seek Emergency Care Immediately if Any of the Following Occurs

(Nolan et al., 2012)

- Evidence of dehydration
- Unable to eat or drink for 24 hours
- Treatment change not effective within six hours

ADDENDUM

A useful grading tool for nausea and vomiting is the Common Terminology Criteria for Adverse Events published by the National Cancer Institute Cancer Therapy Evaluation Program (see Table 4).

Table 4. Grading of Nausea and Vomiting

Event	Grade	Clinical Presentation
Nausea	1	Loss of appetite without alteration in eating habits
	2	Oral intake decreased without significant weight loss, dehydration, or malnutrition
	3	Inadequate oral caloric or fluid intake; tube feeding, total parenteral nutrition (TPN), or hospitalization indicated
	4	—
	5	—
Vomiting	1	Intervention not indicated
	2	Outpatient IV hydration; medical intervention indicated
	3	Tube feeding, TPN, or hospitalization indicated
	4	Life-threatening consequences
	5	Death

Note. From *Common Terminology Criteria for Adverse Events* [v.5.0], by National Cancer Institute Cancer Therapy Evaluation Program, 2017. Retrieved from https://ctep.cancer.gov/protocolDevelopment/electronic_applications/docs/CTCAE_v5_Quick_Reference_5x7.pdf.

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Pamela J. Pearson, RN

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Oral Mucositis

PROBLEM

Mucositis affects the mucous membranes that line the gastrointestinal tract and can manifest as inflammation or ulceration, both of which cause pain. If the inflammation or ulcerations occur in the mouth or oropharynx, it is referred to as *oral mucositis*, which affects 20%–40% of patients who receive standard chemotherapy (Eilers, Harris, Henry, & Johnson, 2014; Gibson et al., 2013; Lalla, Bowen, et al., 2014), 80% of patients undergoing hematopoietic stem cell transplantation (Eilers et al., 2017), and essentially all patients receiving radiation therapy for head and neck cancer (Bonomi & Batt, 2015; Chen et al., 2015; Lalla, Saunders, & Peterson, 2014).

Oral mucositis usually begins with asymptomatic erythema of the oral mucosa that may cause patients to complain of burning or tingling in the mouth. Patchy erythema and edema can develop and progress to confluent erythema, edema, and white patches, which can eventually progress into painful ulcers, leading to active bleeding and necrosis in some patients (Al-Dasooqi et al., 2013; Lalla, Saunders, & Peterson, 2014; Sonis, 2013). The mouth is the most frequently documented source of infection in immunocompromised patients.

ASSESSMENT CRITERIA

(Lalla, Saunders, & Peterson, 2014; Peterson, Srivastava, & Lalla, 2015)

1. What is the cancer diagnosis, and what treatment is the patient receiving?
Mucositis can develop as a side effect from the following:
 - a. Some chemotherapy agents (within 5–7 days of administration, but the myelosuppressive effects of chemotherapy may not occur for as many as 10–12 days following treatment)
 - b. Mammalian target of rapamycin (mTOR) inhibitors (mucositis presents as oral aphthous stomatitis)
 - c. Radiation therapy to the oral cavity (within 7–10 days)
 - d. Hematopoietic stem cell transplantation
 - e. Recent oral surgery
 - f. Poor oral hygiene
2. What medications is the patient taking?
Obtain medication history.
3. Ask the patient to describe symptoms in detail.
The patient should include the affected location(s) (e.g., lips, tongue, mucous membranes, gingiva [gums], teeth, denture-bearing area) of any of the following symptoms:
 - a. Erythema

- b. Ulcerations
- c. Blisters
- d. White patches or sticky white film
- e. Pain
- f. Difficulty swallowing
- g. Hoarseness
- h. Taste alterations
- i. Fever
- j. Decreased oral intake
- k. Sore throat

A variety of tools can be used to facilitate oral assessment by members of the healthcare team, including the Oral Assessment Guide (OAG) (Eilers, Berger, & Petersen, 1988), the World Health Organization (1979) scale, the National Cancer Institute (NCI) Cancer Therapy Evaluation Program (2017) Common Terminology Criteria for Adverse Events, and the Beck Oral Assessment Scale (Beck, Agutter, Dudley, Peterson, & McGuire, 2007). A 10-item visual analog tool, the Patient-Reported Oral Mucositis Symptom (PROMS) scale, has also been used to capture the patient's perspective (Gussgard, Hope, Jokstad, Tenenbaum, & Wood, 2014).

4. Obtain history regarding the following:
 - a. Current oral hygiene practices
 - b. Social history of tobacco and alcohol use
5. Is the patient's condition stable or worsening?
6. Are any relieving factors effective?
 - a. Ice chips
 - b. Cold water rinses
 - c. Local or systemic analgesics
7. Assess nutritional intake.
 - a. Current diet
 - i. Oral intake (e.g., liquid, soft, regular)
 - ii. Tube feedings
 - b. Any recent weight loss
8. Assess for changes in activities of daily living and function.

Signs and Symptoms	Action
<ul style="list-style-type: none"> Uncontrolled bleeding Difficulty breathing Temperature higher than 100.4°F (38°C) or chills with suspected neutropenia 	Seek emergency care. Call an ambulance immediately.

(Continued on next page)

ORAL MUCOSITIS

(Continued)

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Severe ulceration and inability to take nutrition orally or swallow • Bleeding from gums, oral cavity, or mouth (that does not stop within 5–10 minutes of applying pressure) • Signs of dehydration <ul style="list-style-type: none"> – Decreased urine output – Sunken eyes – Pinched skin that does not spring back – Excessive thirst or dry mouth – Light-headedness • Painful erythema, edema, or ulcers that make swallowing difficult • White patches (or sticky white film) in the mouth • Pain unrelieved by acetaminophen or previously prescribed pain relievers • Inability to eat soft foods • Foul odor coming from mouth • Worsening of symptoms 	<p>Seek emergency care.</p> <p>Seek urgent care within 24 hours.</p>
<ul style="list-style-type: none"> • Temperature higher than 100.4°F (38°C) without suspected neutropenia • Painful erythema, edema, ulcers, or white patches but still able to eat and swallow • Painless ulcers, white patches, erythema, or mild soreness without lesions 	<p>Notify healthcare provider and continue homecare instructions.</p>
<p><i>Note.</i> Based on information from Bensinger et al., 2008; Eilers et al., 2014.</p>	

HOMECARE INSTRUCTIONS

- Inspect mouth daily (Peterson, Boers-Doets, Bensadoun, & Herrstedt, 2015) and call healthcare provider if changes occur, including new sores, swelling, bleeding, pain, or white patches (sticky white film).
- Monitor temperature daily and call healthcare provider for fever (temperature higher than 100.4°F [38°C]) without suspected neutropenia. Seek emergency care/call an ambulance immediately for fever (temperature higher than 100.4°F [38°C]) with suspected neutropenia.
- Practice good oral hygiene.
 - Use a soft toothbrush (Bonomi & Batt, 2015; De Sanctis et al., 2016; Eilers et al., 2014; Harris, Eilers, Harriman, Cashavelly, & Maxwell, 2008; Kartin, Tasci, Soyuer, & Elmali, 2014; Morton et al., 2008; Peterson, Boers-Doets, et al., 2015).
 - Brush teeth at least twice a day (Eilers et al., 2014; Peterson, Boers-Doets, et al., 2015) using a pea-sized amount (or smaller) of Biotène® toothpaste (Jyoti, Shashikiran, & Reddy, 2009).
 - * Biotène toothpaste is recommended; however, flavored toothpaste may make brushing more palatable (bubble gum flavors are the easiest, non-irritating flavors to find).

- * Avoid any toothpaste without an American Dental Association (ADA) seal.
- * Avoid any toothpaste with an ADA seal that contains pyrophosphate, hexametaphosphate, cinnamon flavoring, strong mint flavoring, or sodium lauryl sulfate.
- * Avoid any toothpaste with an ADA seal that is labeled as “whitening,” “brightening,” or “tartar control.”
- Good technique is critical when brushing.
 - * Brush for two minutes.
 - * Use a gentle rotating/circular motion.
 - * Hold the toothbrush at a 45° angle to the tooth surface (Kartin et al., 2014).
 - * Rinse the brush well using warm water (Peterson, Boers-Doets, et al., 2015).
 - * Allow the toothbrush to air dry between uses.
 - * Do not cover or cap toothbrush (Peterson, Boers-Doets, et al., 2015).
 - * Change toothbrush at least every three months.
- For babies or patients without teeth, use a moistened gauze or clean washcloth two to three times a day to clean the gums.
 - * If in the home setting, paper towels can be used. Do not use facial tissue.
 - * Moisten gauze, washcloth, or paper towel with tap water. Begin using a toothbrush to brush gums and tooth when the first tooth erupts. Biotène toothpaste may be used on the gums.
 - * For adults without teeth, secure clean gauze on the end of a tongue blade to gently clean the gums.
 - * Oral swabs may be used, but they are not as effective in removing debris as a soft toothbrush or moistened gauze, washcloth, or paper towel.
- Floss daily (Eilers et al., 2014) with waxed floss (Bonomi & Batt, 2015) if platelet count is greater than 50,000/mm³ and white blood cell count is greater than 1,000/mm³; avoid any sore or bleeding areas of the gums. Pediatric patients should begin flossing when teeth are touching.
- For patients who wear dentures, use a denture brush or toothbrush and regular toothpaste at least once a day or after meals (Kartin et al., 2014; Peterson, Boers-Doets, et al., 2015).
 - * Clean denture storage container at least once a week.
 - * Wear dentures only when eating foods that need dentures if they are irritating the oral mucosa (Peterson, Boers-Doets, et al., 2015).
 - * Avoid use of dentures if mouth sores are present under them (Peterson, Boers-Doets, et al., 2015).
 - * Do not use denture adhesives.
 - * Do not wear loose dentures.
- Complete lip care at least twice a day with lanolin (Lansinoh® or other lanolin, USP ointments) (Santos et al., 2013; Schubert, Peterson, & Lloid, 1999). Other options include Aloe Vesta® skin protectant, RadiaBlock™ lip balm, Biotène lip moisturizer gel, Aquaphor®, and Eucerin®.
 - Lanolin-based creams and ointments are more effective in moisturizing and protecting against damage than petrolatum-based products (Eilers et al., 2014).

- Avoid use of ChapStick®; occlusive lip balms, such as petrolatum, may promote microbial growth (Eilers et al., 2014).
- Use oral rinses (rinse and gargle for 15–30 seconds or as tolerated; do not swallow) at least four times a day, especially after meals, if erythema or bleeding is present. Oral rinse options include the following:
 - Salt and baking soda (one-fourth teaspoon regular table salt mixed with one-half teaspoon baking soda in four ounces of water) (De Sanctis et al., 2016; Eilers et al., 2014; Harris et al., 2008; Kartin et al., 2014; McGuire et al., 2013; Scarpace, Brodzik, Mehdi, & Belgam, 2009; Vokurka et al., 2005)
 - Salt water (one teaspoon regular table salt mixed in four cups of water)
 - Baking soda rinse (one teaspoon baking soda mixed in eight ounces of water)
 - Plain water
- Use of “magic mouthwash” (i.e., a mixture of viscous lidocaine, Mylanta®, and diphenhydramine) is ineffective and should be avoided (American Academy of Nursing, 2015).
- Use of prophylactic dexamethasone oral solution is encouraged to decrease the incidence and severity of oral aphthous stomatitis caused by mTOR inhibitors (Rugo et al., 2017).
- Avoid use of any mouthwashes that contain alcohol (De Sanctis et al., 2016; Eilers et al., 2014; Peterson, Boers-Doets, et al., 2015), including chlorhexidine with alcohol. Acceptable mouthwashes include Biotène dry mouth oral rinse, Biotène PBF oral rinse, SmartMouth™ dry mouth oral rinse, and Oasis® moisturizing mouthwash (Lalla, Bowen, et al., 2014; Nicolatou-Galitis et al., 2013).
- For patients with dry, thick secretions, frequent oral rinses should be encouraged. Consider arranging portable suction to help remove secretions in the back of the throat as needed.
- Consider use of a syringe with suction tubing to help facilitate oral rinses for patients with a sore mouth or for patients who have difficulty opening their mouth.
- Continue oral fluid intake to maintain hydration and decrease viscosity of secretions. Add humidification as needed (Morton et al., 2008).
- Eat high-protein, high-calorie meals often (e.g., six to eight small meals each day), if applicable.
 - Add extra calories and protein to food (e.g., add powdered milk to soups and casseroles).
 - Add extra fats such as butter, oil, and cream.
- Choose soft, easy-to-chew food. If mouth sores are present or the oral mucosa is sore, take acetaminophen or another prescribed pain medication 30–60 minutes before eating.
- Avoid the following foods and drinks (Morton et al., 2008; Peterson, Boers-Doets, et al., 2015):
 - Foods with sharp edges
 - Hot foods
 - Very spicy, sour, or acidic foods and drinks
 - Sugary foods and drinks

- Foods that will stick to teeth
- Alcohol
- Avoid smoking and using chewing tobacco (Morton et al., 2008; Peterson, Boers-Doets, et al., 2015).

Report the Following Problems

- Pain not relieved by medications
- Bleeding gums
- Temperature higher than 100.4°F (38°C) without suspected neutropenia
- Foul odor coming from the mouth
- New mouth sores
- New swelling in the mouth
- New white patches
- Difficulty eating
- Worsening symptoms

Seek Emergency Care Immediately if Any of the Following Occurs

- Severe ulceration and inability to eat or swallow
- Uncontrolled bleeding
- Difficulty breathing
- Signs of dehydration
- Temperature higher than 100.4°F (38°C) or chills with suspected neutropenia

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Michele Farrington, BSN, RN, CPHON®
Sharon Baumlér, MSN, RN, CORLN, OCN®

Pain

PROBLEM

Pain is a significant problem in patients with cancer, occurring in approximately 55% of patients during cancer treatment; 66.4% of patients with advanced, metastatic, or terminal disease; and 39.3% of patients following curative treatment (van den Beuken-van Everdingen, Hochstenbach, Joosten, Tjan-Heijnen, & Janssen, 2016). Pain can be attributed to cancer treatment, the disease itself, or other comorbid conditions.

ASSESSMENT CRITERIA

1. What is the cancer diagnosis, and what treatment is the patient receiving?
2. What medications is the patient taking?
Obtain medication history (Brant, Eaton, & Irwin, 2017).
 - a. Nonopioids (e.g., acetaminophen, nonsteroidal anti-inflammatory drugs, aspirin)
 - b. Adjuvant analgesics (e.g., antidepressants, anticonvulsants, muscle relaxants)
 - c. Opioids (e.g., morphine, oxycodone, fentanyl, hydromorphone)
 - i. Long acting (e.g., MS Contin®, OxyContin®, Duragesic®, Exalgo®)
 - ii. Short acting (e.g., Percocet®, Vicodin®, Dilaudid®)
3. Pain assessment (Brant, 2014; Gallagher, Rogers, & Brant, 2017)
 - a. Location of pain
 - i. Where is the pain located?
 - ii. Is there more than one site?
 - b. Intensity
 - i. On a scale of 0–10, with 0 being no pain and 10 being the worst pain imaginable, how would you rate the pain right now?
 - ii. What is your pain rating on average? What is your pain rating at its worst? What is your pain rating at its best?
 - c. Quality of pain: What words would you use to describe your pain (e.g., sharp, burning, stabbing, radiating, aching)?
 - d. Temporal factors (e.g., onset, duration, variations)
 - i. When did the pain start?
 - ii. Is it constant?
 - iii. Do you have times of more severe pain or flares of pain (i.e., breakthrough pain; differentiate from uncontrolled background pain)?
 - (1) How often does it occur?
 - (2) How long does it last?
 - (3) Is there a time of day it is better or worse?
 - (4) Does anything make your pain better or worse?

PAIN

- iv. Have you noticed that your pain is worse prior to your regularly scheduled pain medications (i.e., end-of-dose failure)?
- e. Previous treatments
 - i. What types of treatments have you tried to relieve your pain?
 - ii. Did these treatments help?
- f. Effects of pain, insomnia, depression, or anxiety
4. Ask about any associated symptoms (e.g., fever, swelling, redness).
5. Review past medical history (e.g., hypertension, gastrointestinal ulceration, renal impairment, sleep apnea, arthritis, history of chronic pain).
6. Assess for changes in activities of daily living and function (e.g., physical, social).

Signs and Symptoms	Action
<ul style="list-style-type: none">• Signs/symptoms of acute injury, spinal cord compression, pathologic fracture, infection, or other life-threatening problem• Sudden onset of severe weakness or unrelenting localized pain; inability to ambulate or decreased sensation in extremities; loss of control of bowel or bladder• Chest pain	Seek emergency care. Call an ambulance immediately.
<ul style="list-style-type: none">• Sudden onset of moderate to severe pain• Pain not responsive to current medication regimen• Pain that interferes with mobility	Seek medical care within two to four hours.
<ul style="list-style-type: none">• Mild to moderate pain that has been increasing• Pain that is not controlled by current regimen• Pain that is interfering with activity or sleep	Seek medical care within 24 hours.
<ul style="list-style-type: none">• Mild to moderate aches and pains	Follow homecare instructions. Notify MD if no improvement.

HOME CARE INSTRUCTIONS

- Take acetaminophen, aspirin, or ibuprofen per label instructions for mild pain as recommended by physician.
 - Patients with compromised liver function should be cautioned on the use of acetaminophen.
 - Ibuprofen should not be used in patients with low platelet counts, gastrointestinal problems (e.g., gastrointestinal bleed), or renal compromise.
- Take prescription analgesics as prescribed.
- Maintain activity as tolerated.
- Keep a pain diary, including pain location, quality, intensity, timing, and interventions taken; nonpharmacologic measures and pain medication taken; and intensity evaluation of the response to trialed interventions.
- Consider complementary therapies. Physical or cognitive behavioral therapy can help reduce pain by involving the body (Eaton, Brant, McLeod, & Yeh, 2017).

- Relaxation techniques
- Heat or cold
- Distraction therapy using music, humor, or hobbies
- Visualization
- Guided imagery
- Massage

Report the Following Problems

- No improvement in pain
- Pain that does not subside with interventions
- Other side effects, such as sedation, nausea, or constipation

Seek Emergency Care Immediately if Any of the Following Occurs

- Excruciating pain
- Immobility
- Low back pain associated with loss of bladder or bowel control; bilateral extremity weakness, which could indicate spinal cord compression

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Jeannine M. Brant, PhD, APRN, AOCN®, FAAN

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Rash

PROBLEM

Rash is a disorder characterized by the presence of macules (flat) and papules (elevated) on the skin. It is a common side effect of several treatments for patients with cancer, including radiation therapy and systemic therapies. Rashes can be very distressing for patients emotionally and physically (Börjeson, Starkhammar, Unosson, & Berterö, 2012).

ASSESSMENT CRITERIA

1. What is the cancer diagnosis, and what treatment is the patient receiving?
 - a. Numerous medications, including cancer therapies, may cause a rash.
 - i. Targeted therapy
 - (1) Epidermal growth factor receptor (EGFR) inhibitors may result in an acneform rash, which is characterized by an eruption of papules and pustules typically appearing on the face, scalp, upper chest, and back. Table 8 outlines these agents and the frequency of reported skin rashes.

Table 8. Incidence of Rash With Epidermal Growth Factor Receptor–Targeted Therapies

Agent	Any Rash Incidence	Grade 3–4 Severe Rash
Afatinib	90%, when first-line EGFR agent 70%, in squamous NSCLC	16%, when first-line EGFR agent 9%, in squamous NSCLC
Cetuximab	89%	12%
Erlotinib	85%	14%
Gefitinib	66%	3%
Lapatinib (+ capecitabine)	28%	2%
Osimertinib	41%	0.5%
Panitumumab	89%	12%
EGFR—epidermal growth factor receptor; NSCLC—non-small cell lung cancer <i>Note.</i> Based on information from Amgen, Inc., 2009; AstraZeneca Pharmaceuticals LP, 2015a, 2015b; Boehringer Ingelheim Pharmaceuticals, Inc., 2013; Bristol-Myers Squibb Co., 2012; Novartis Pharmaceuticals Co., 2017; OSI Pharmaceuticals, Inc., 2010.		

- (2) Multitargeted agents (e.g., sorafenib, sunitinib)
- (3) Other targeted agents (e.g., imatinib)
- ii. Chemotherapy: Figure 12 provides a listing of chemotherapy agents (not all inclusive) with rash as a reported adverse effect.
- iii. Immunotherapy (e.g., atezolizumab, ipilimumab, nivolumab, pembrolizumab)
- iv. Other medications that can cause rash (e.g., antibiotics, antiseizure medications, pain medications, corticosteroids, blood thinners, non-steroidal anti-inflammatory agents) (Lacouture, 2012)
- b. Radiation therapy may result in rash-like skin reactions, including dermatitis, burn, or a radiation recall reaction.
- c. Infection can manifest in rash-like appearance (e.g., candidiasis, cellulitis, chicken pox, erythema multiforme, herpes simplex, herpes zoster [shingles], impetigo, measles, rubella, scabies, Lyme disease).
- d. Allergic reactions often manifest as a rash and may be caused by an antibiotic or other drug allergy, atopic dermatitis, angioedema, or contact dermatitis.
- e. Environmental reactions may present as a rash and may be caused by sunburn, a chemical irritant, overwashing or overdrying of skin, or plant or animal exposure.
- f. Autoimmune conditions (e.g., cutaneous lupus, erythema nodosum, dermatomyositis, systemic lupus erythematosus, thrombocytopenic purpura, petechiae, psoriasis, eczema) may manifest with rash-like symptoms.
- g. Rash may result from the cancer itself, including abdominal/gastrointestinal tumors, adrenocorticotrophic hormone-producing tumors, basal cell and squamous cell carcinoma, carcinoid, colon cancer, cutaneous T-cell lymphoma, Kaposi sarcoma, leukemia, melanoma, and neurofibroma.
- h. Rash may be psychosomatic resulting from stress, anxiety, or tension.

Figure 12. Anticancer Agents With Rash as a Potential Side Effect

• Aldesleukin	• Cyclophosphamide	• Interleukin-2	• Pemetrexed
• Alemtuzumab	• Cytarabine	• Ipilimumab	• Procarbazine
• Asparaginase	• Doxorubicin	• Irinotecan	• Rituximab
• Atezolizumab	• Durvalumab	• Lenalidomide	• Taxanes (e.g., docetaxel, paclitaxel)
• Avelumab	• Epoetin alfa	• Leucovorin	• Temozolomide
• Bexarotene	• Estramustine phosphate	• Mechlorethamine	• Temsirolimus
• Bicalutamide	• Etoposide	• Medroxyprogesterone	• Teniposide
• Bleomycin	• Filgrastim	• Melphalan	• Thalidomide
• Bortezomib	• 5-Fluorouracil	• Methotrexate	• Thiotepa
• Capecitabine	• Gemcitabine	• Mitoxantrone	• Tositumomab
• Carboplatin	• Goserelin	• Nivolumab	• Trastuzumab
• Chlorambucil	• Ibritumomab	• Octreotide	• Vincristine
• Cisplatin	• Ifosfamide	• Oprelvekin	• Vinorelbine
• Cladribine	• Interferons	• Pembrolizumab	
• Clofarabine			

Note. Based on information from Lacouture, 2012; Sibaud, 2018; Wilkes, 2018.

2. What medications is the patient taking?
Obtain medication and allergy history. Table 8 and Figure 12 provide listings of anticancer therapies with rash as an associated side effect.
3. Ask the patient to describe symptoms in detail.
 - a. Onset of rash
 - b. Initial location of rash
 - c. Areas where rash has spread
 - d. Conjunctival involvement
 - e. Color
 - f. Texture (raised, flat, or blistered)
 - g. Change in character of rash with time
 - h. Any associated symptoms (e.g., itching, burning, numbness, pain, fever, headache, malaise, arthralgia, conjunctivitis)
 - i. Aggravating factors, such as sunlight
 - j. Alleviating factors and treatments tried
 - k. Contact with those who have a similar rash
 - l. Recent travel
 - m. Insect bites or stings
 - n. New skin products (e.g., lotion, soap, laundry detergent)
 - o. New medications
 - p. Radiation therapy
 - q. Pruritus
 - r. Crusting of skin
 - s. Pain, redness, warmth, or tingling
 - t. Drainage or “weeping”
4. Obtain history of the problem.
 - a. Precipitating factors
 - b. Onset and duration
 - c. Relieving factors
 - d. Any associated symptoms (e.g., allergic reactions, infections, systemic conditions)
5. Review past medical history.
 - a. Exposure to people with a similar rash
 - b. Diabetes
 - c. Kidney disease
 - d. Skin diseases (e.g., psoriasis, eczema)
6. Assess for changes in activities of daily living and function.

Signs and Symptoms	Action
• Acute skin changes and associated systemic symptoms, such as swelling of throat, stridor, wheezing, dyspnea, chest pain, severe headache, eye involvement, desquamation, high fever, or mottled skin below the waist	Seek emergency care. Call an ambulance immediately for acute respiratory symptoms.

(Continued on next page)

(Continued)

Signs and Symptoms	Action
<ul style="list-style-type: none"> • Infection: drainage from lesion • Uncontrolled pruritus • History of new drug (suspected drug-induced rash in absence of respiratory symptoms) • Systemic symptoms associated with infections or viral syndrome, such as fever, myalgias, or arthralgias • Rash related to chemotherapy, biologic therapy, or targeted therapy agents <ul style="list-style-type: none"> – Hand-foot syndrome – Papulopustular rash (often on the face and chest) – Mild pruritus – Mild pain or discomfort from skin alteration – Nonprogressive symptoms 	<p>Seek urgent care within 24 hours.</p> <p>Follow homecare instructions. Notify MD if no improvement or if condition worsens.</p>
Cross-references: Hand-Foot Syndrome, Pruritus (Itch)	

HOME CARE INSTRUCTIONS

- Report changes in itching or rash to healthcare provider.
- Report presence of drainage from skin lesions.
- Apply cool compresses to inflamed area.
- Apply topical medication as prescribed.
- Take oral medication as prescribed and notify healthcare provider of side effects. Expect drowsiness from antihistamines and take safety precautions.
- Wear loose-fitting cotton clothing.
- Keep fingernails cut short and wear soft mittens at night to avoid scratching.
- Avoid hot baths and showers.
- Avoid sunlight and use sunscreen and sun protection.
- Hand-foot syndrome: Refer to Hand-Foot Syndrome protocol.
- Follow precautions for EGFR acneform rash.
 - Moisturize with fragrance-free cream.
 - Apply topical steroid or antibiotic cream as ordered by clinician.
 - Take oral antibiotics as prescribed.
 - If indicated, avoid extreme temperatures and direct sunlight.
 - Keep nails clean and trimmed while on therapy to avoid paronychia (Lacouture et al., 2011).
 - If prescribed afatinib or erlotinib, take on an empty stomach, as they interact with food and may result in an increased risk of side effects.

Report the Following Problems

- Rash progression
- No improvement over the next three days
- Fever that persists for 24 hours
- Increasing pain or uncontrolled pruritus

Seek Emergency Care Immediately if Any of the Following Occurs

- Severe headache
- Difficulty breathing and throat tightening
- Chest pain
- High fever
- Eye involvement

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Beth Eaby-Sandy, MSN, CRNP

