Oncology nurses frequently encounter infusion-related reactions when administering cancer therapies. Knowing how to recognize and intervene during these reactions is essential to patient safety and quality care. This article reviews potential signs and symptoms of infusion-related reactions, the pathophysiology behind these reactions, risk factors, and management strategies.

AT A GLANCE

- Infusion-related reactions occur frequently when administering IV medications in inpatient and outpatient settings.
- Nurses should know the reaction potential of drugs they are administering before initiating the infusion. When applicable, verify that ordered premedications were given, and have emergency equipment and medications available prior to starting the infusion.
- Prompt recognition of reaction symptoms and quick action to intervene are essential to patient safety. Accurate nursing documentation of the reaction should tell the entire story of the reaction from start to finish.

KEYWORDS
infusion-related reaction; hypersensitivity; reaction; management

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Acute Infusion-Related Reactions

How to recognize and intervene when these reactions occur in practice

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Acute infusion-related reactions (IRRs) occur daily, sometimes multiple times per day, in outpatient infusion areas and on inpatient oncology units where chemotherapy, biotherapy, immunotherapy, and targeted therapies are administered. Symptoms related to an IRR can include one or more body systems and be cutaneous in nature or related to respiratory, cardiovascular, or gastrointestinal systems (Olsen et al., 2019) (see Table 1). Other symptoms, such as rigors and fever, may be present but are most commonly seen with monoclonal antibody administrations or agents that stimulate T cells, such as chimeric antigen receptor T cells (Shimabukaro-Vornhage et al., 2018). Reactions can range from mild to severe, with the potential to progress into anaphylaxis if not treated appropriately (Castells, 2015).

IRRs are mediated by the immune system and can involve several different mechanisms for activating an immune response (Olsen et al., 2019). Reactions caused by mast cell or basophil activation can either be immunoglobulin E (IgE)–mediated or non–IgE-mediated. This type of reaction is further classified into immediate (begins at drug initiation or shortly thereafter) or delayed (occurs hours, days, or weeks after administration) (Olsen et al., 2019; Shimabukaro-Vornhage et al., 2018). Alternatively, IRRs can be triggered by T cells, macrophages, or lymphocytes and cause release of specific cytokines, such as tumor necrosis factor or various interleukins (Isabwe et al., 2018). In severe cases, this type of reaction can cause hypotension, vascular leakage, and organ failure because of the massive release of cytokines within the body (Shimabukaro-Vornhage et al., 2018).

Terminology used to describe these reactions can vary; however, common terms used are IRR, hypersensitivity, cytokine reaction, and anaphylaxis. For the purposes of this article, the National Cancer Institute (2017) Common Terminology Criteria for Adverse Events (CTCAE), version 5.0, is used to describe the most common reaction types. An IRR is a disorder characterized by adverse reaction to the infusion of pharmacologic or biologic substances. Cytokine release syndrome is a disorder characterized by fever, tachypnea, headache, tachycardia, hypotension, rash, and/or hypoxia caused by the release of cytokines. Anaphylaxis is a disorder characterized by an acute inflammatory reaction resulting from the release of histamine and histamine-like substances from mast cells, causing a hypersensitivity immune response. Clinically, it presents with breathing difficulty, dizziness, hypotension, cyanosis, and loss of consciousness and may lead to death. The CTCAE uses a grading system from grade 1 (mild) to grade 5 (death), which can be helpful in determining the severity of the reaction (see Table 2).

Risk Factors

Several factors can place patients at higher risk for having an IRR. Some chemotherapy agents (e.g., platins, taxanes,