FEATURE ARTICLE

A Review of Anemia Management in the Oncology Setting:
A Focus on Implementing Standing Orders

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Standing orders serve an important role in various healthcare settings by empowering nurses to implement certain procedures and activities on behalf of physicians, enabling more immediate interventions, and ultimately improving patient care. Standing orders are based on established clinical practice guidelines and are well suited for supportive interventions. Several evidence-based clinical practice guidelines are available for the treatment of anemia in patients with cancer. The guidelines can serve as a basis for the development of standing orders for the management of treatment-related anemia in patients with cancer, which will enable the delivery of consistently high-quality care to patients. A major advantage to the implementation of standing orders is that patients with suboptimal hemoglobin levels can be treated by oncology nurses in a timely manner and receive high-quality care that is consistent with available clinical evidence.

Standing orders, as defined by the National Institutes of Health (NIH), are predetermined medical orders that allow nursing staff to carry out certain procedures or activities on behalf of medical staff (NIH Clinical Center, 2000). The objective of standing orders is to maintain a standard of practice while providing consistent care for patients. As such, standing orders are derived from evidence-based clinical practice guidelines and ultimately serve to maximize patient care and outcomes. Nurses play an essential role in the development and implementation of standing orders. As stated in the Oncology Nursing Society (ONS) Statement on the Scope and Standards of Oncology Nursing Practice, the oncology nurse “participates in quality assessment and improvement activities relative to the nurse’s position and practice environment,” including “collaborating with other disciplines to determine priority patient care issues for quality when monitoring patient outcomes” (Brant & Wickham, 2004, p. 2). When developed with clinical practice guidelines, standing orders empower oncology nurses to deliver consistently high-quality patient care. The purpose of this article is twofold: first, to summarize the benefits and limitations of standing orders from a general perspective; second, to review the established evidence-based clinical practice guidelines for anemia management in patients with cancer, which ultimately can serve as the basis for the development of standing orders.

The Benefits of Standing Orders

Standing orders, when written by a multidisciplinary team that includes physicians, nurses, and pharmacists, allow nurses to initiate and discontinue drugs more autonomously within the scope of their expertise and knowledge. Standing orders enable nurses to assess the supportive care needs of their patients and to initiate appropriate action without delay that may occur when physician contact is required. They empower nurses to proceed with immediate interventions, saving valuable time for themselves, patients, and physicians. For example, standing orders for acute hypersensitivity reactions are used commonly in oncology settings. Orders for acute hypersensitivity reactions allow for prompt administration of emergency medications, potentially decreasing mortality rates.

At a Glance

✦ Clinical practice guidelines and standing orders empower nurses to initiate appropriate action without delay.
✦ As health care moves toward increased accountability, oncology nurses will be responsible for making certain that care is based on research and standardized guidelines.
✦ Emerging data have led to revised labeling for erythropoietic stimulating agents. Existing institutional protocols and/or standing orders may need to be revised.

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An excellent example of the potential benefits associated with standing orders was demonstrated by nurses at the H. Lee Moffitt Cancer Center and Research Institute in Tampa, FL. As described by Rice, Wetzstein, Greene, Gaudette, and Bradbury (2005), a multidisciplinary task force developed rapid-response standing orders for neutropenic fever in patients with cancer to help alleviate inconsistent responses to febrile neutropenia. Retrospective and prospective chart reviews evaluated the total time from admission to the administration of first antibiotic. After implementation of standing orders, time from admission to first antibiotic decreased by 33%. Prior to initiation of standing orders, 15% of studied patients waited four hours or more for administration of antibiotics; after implementation of the standing orders, none waited four hours or more. When healthcare providers were educated and standing orders were implemented, patients at risk were identified and treated for febrile neutropenia more promptly.

Another study described the practice patterns for the management of myelosuppressive disorders in three oncology clinics before and after the institution of screening protocols (White, Maxwell, Michelson, & Bedell, 2005). The three clinics surveyed were the West Michigan Cancer Center in Kalamazoo; the Highland Hospital in Rochester, NY; and the Oncology Hematology Group of South Florida in Miami. The analysis demonstrated that implementing screening protocols improved the management of neutropenia, resulting in significantly fewer delays and reductions in chemotherapy doses. Using screening protocols as a basis for instituting standing orders may further enhance appropriate and timely patient care.

Obstacles to Implementing Standing Orders

State laws vary widely regarding the use of standing orders. Some states or institutions may require that protocols accompany standing orders. In Virginia, for example, no provision exists in the Drug Control Act for the use of standing orders for medications. Inquiry to respective state boards of nursing can eliminate uncertainties. Depending on a particular institution’s policies and procedures, using standing orders for medications or treatments without having protocols in place may leave nurses vulnerable to disciplinary action for practicing nursing outside their legal scope of practice. Generally, nurse practice acts provide broad guidelines rather than specific instructions that might limit nurses to specific activities (Fedorka & Resick, 2000).

Establishing Standing Orders

A systematic approach can facilitate the development of standing orders (see Figure 1). Maxwell (2005) suggested first selecting the standing order your practice would like to develop based on a particular clinical problem that may have arisen repeatedly. A multidisciplinary team that includes nurses, physicians, and pharmacists should collaborate on the development of protocols and standing orders based on established practice guidelines, such as the National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology (NCCN, 2007a, 2007b). (See Figure 2 for additional resources.)

A review of the literature about evidence-based practice data may aid in development of a protocol and/or standing order. A pilot test, beginning with a small number of patients, may identify potential challenges and allow for refinement of the order prior to broad implementation. Once the final format and content are settled, the next step is to submit the proposed standing order for administrative approval, using available supportive data. Finally, for successful implementation and long-term adherence, healthcare professionals should develop a plan to educate staff and patients about use of the standing order and audit and update the order regularly.

The Role of Oncology Nurses in Standing Orders

As the healthcare industry moves toward increased accountability regarding quality of patient care, oncology nurses will be responsible for making certain that their nursing care is based on research and standardized guidelines. The ONS Web site (www.ons.org) includes a section on evidence-based, peer-reviewed practice resources that may serve as a valuable tool to assist oncology nurses with writing and establishing standardized orders. In addition, ONS has mentoring programs that match those who are less familiar with establishing standing orders with more experienced oncology nurses. Many Internet sites have examples of practice guidelines that can serve as templates and starting points for the development of guidelines (see Figure 2).

Potential obstacles to implementation should be taken into consideration when writing and establishing standing orders. Noncompliance from coworkers, physicians, and administrators may become an issue when standing orders have not been previously implemented in clinical settings (Maxwell, 2005). Some physicians may be unwilling to forfeit their autonomy by approving a process, such as standing orders, that allows for independent implementation by nurses (Aiello, 2002). Clinical colleagues may be unwilling to adhere to clinical practice guidelines for several reasons, including unfamiliarity, general nonconcordance, and belief that guidelines are not an effective means of managing certain symptoms (Cabana et al., 1999).

1. Determine a common clinical issue that would benefit from a standing order.
2. Establish a multidisciplinary team.
4. Complete a literature search for articles centered on evidence-based practice.
5. Contact the state board of nursing to review state laws regarding standing orders.
6. Contact the facility’s continuous quality-improvement committee for facility guidelines.
7. Meet regularly as a work group to review the process.
8. Develop the standing order.
10. Finalize the standing order.
11. Obtain administrative approval.
12. Provide ongoing, focused staff and patient education.
13. Audit and update standing orders on a regular basis.

Figure 1. Steps to Initiate a Standing Order

Note. Based on information from Maxwell, 2005.
Nurses are well positioned to be agents of change, leading the way to evidence-based practice that will ensure high-quality patient care.

Clinical Practice Guidelines for Anemia Management

One example of a clinical problem for which standing orders can improve patient care is cancer treatment-related anemia. Effectively managing anemia is important in oncology settings. Large, community-based, open-label studies and clinical trials with placebo controls consistently have demonstrated that increased hemoglobin levels improve patients’ cancer- and anemia-related fatigue, energy levels, and overall quality of life (QOL) (Cortesi et al., 2005; Littlewood, Cella, Nortier, & the Epoetin Alfa Study Group, 2002).

In response to the prevalence of anemia in patients with gynecologic cancers, guidelines for anemia management were developed in a gynecologic oncology practice (Gynecologic Oncology and Pelvic Surgery Associates, Columbus, OH). Prior to institution of the guidelines, patients with hemoglobin concentration levels of 9–10 g/dl were not uncommon. Anemia guidelines developed for patients with chemotherapy-induced anemia were adopted for all patients with hemoglobin levels < 12 g/dl. The development and implementation of anemia treatment guidelines allowed oncology nurses to enhance the quality of care for patients with gynecologic cancer (Tangeman, 2004).

Various treatment guidelines to assist in establishing standing orders for anemia management are readily available to oncology nurses, such as the NCCN Clinical Practice Guidelines in Oncology, specifically those for cancer-related fatigue (NCCN, 2007b). The guidelines state that if anemia associated with cancer-related fatigue is identified during initial evaluation, further assessment of anemia should be conducted as outlined in the NCCN’s guidelines for Cancer- and Treatment-Related Anemia (NCCN, 2007a). The guidelines were developed by an expert panel that reviewed and weighed the strength of available evidence. In areas that lacked evidence, recommendations were based on available information. Ongoing assessment of fatigue and potential association with anemia is an important aspect of comprehensive patient assessment.

The NCCN guidelines for Cancer- and Treatment-Related Anemia (NCCN, 2007a) suggested that once a patient’s hemoglobin concentration drops below 11 g/dl (normal range = 14–18 g/dl for men, 12–16 g/dl for women) and the patient has been determined to have cancer- or treatment-related anemia, the patient should be categorized as one of the following. The first category includes patients who are asymptomatic, with no risk factors for anemia, in which case observation and regular reevaluation for symptoms and risk factors are deemed appropriate. The second category is for patients who are asymptomatic but have risk factors for anemia. Such patients should be observed and regularly reevaluated for symptoms and risk factors, as well as considered for erythropoietic therapy. The third category is for patients who are symptomatic, in which case transfusion may be necessary; if a patient’s hemoglobin concentration is 10–11 g/dl, erythropoietic therapy should be considered. The greatest improvement in QOL has been observed when hemoglobin concentration increases into the 11–13 g/dl range (Crawford et al., 2002). Optimal management of anemia has the potential to improve QOL for anemic patients receiving chemotherapy.

Emerging safety data have led to revised product labeling for erythropoietic stimulating agents (ESAs). For patients with cancer receiving chemotherapy, the agents should be held for hemoglobin exceeding 12 g/dl and resumed at a reduced dose when hemoglobin falls below 11 g/dl (previously held for hemoglobin exceeding 13 g/dl and resumed at reduced dose when hemoglobin fell below 12 g/dl) (Amgen Inc., 2007; Ortho Biotech Products, L.P., 2007). NCCN (2007a) suggested the following when applying the data to clinical practice. “Meta-analyses have not demonstrated a survival advantage or disadvantage with ESA therapy. Physicians should carefully consider the risks and benefits of using ESAs in anemic cancer patients not receiving chemotherapy. . . . Until new evidence changes the current benefit-risk estimates, physicians should be advised not to administer ESAs outside of the treatment period of cancer-related therapy (defined by a consensus of the NCCN panelists as six weeks after the completion of either chemotherapy or radiation).” (p. MS-9).

Iron studies (i.e., serum iron, total iron binding capacity [TIBC], and serum ferritin) should be performed on all potential candidates for erythropoietic therapy, and supplementation should be implemented when iron stores are low. Patients receiving erythropoietic therapy should be observed for hemoglobin response, defined as an increase of 1 g/dl, after four weeks of therapy. Titration should be considered for nonresponders; iron stores should be tested, and other causes of anemia should be considered and corrected. Anemia-related symptoms should be reevaluated on a regular basis (NCCN, 2007a).

Patients with cancer who are on extended erythropoietic therapy may develop functional iron deficiency, which is characterized by serum ferritin < 100 ng/ml or a transferrin saturation level < 20%, indicative of poor iron utilization.
(see Table 1). Such deficiency can be corrected with oral iron supplements, although more recent data suggest that patients with functional iron deficiency caused by anemia of chronic disease may respond better to IV iron than to oral iron (NCCN, 2007a).

The ONS Chemotherapy and Biotherapy Guidelines and Recommendations for Practice (Polovich, White, & Kelleher, 2005) suggested collaborative management, which consists of assessing patient fatigue, ascertaining the underlying reason for anemia, initiating iron supplementation when serum ferritin is <100 ng/ml or transferrin saturation is <20%, managing hypoxia-related symptoms, and comparing anemia-related laboratory results with standardized laboratory indices. The use of standing orders would ensure the maintenance of practice standards and provision of consistent care. In patients for whom it is indicated, ONS recommended recombinant human erythropoietin (Polovich et al.). The 2005 guidelines addressed the use of epoetin alfa and darbepoetin alfa in terms of patient selection, goals of hemoglobin increase, and dosing criteria. ONS deferred to the NCCN guidelines on when to initiate erythropoietic therapy, suggesting that 11 g/dl is an appropriate hemoglobin level at which to initiate treatment. The authors of the guidelines suggested that hemoglobin be monitored “at least weekly” (Polovich et al.) until concentration increases to 12 g/dl, thereafter monitored at least monthly.

In addition to the NCCN guidelines and the ONS recommendations for practice, the American Society of Clinical Oncology (ASCO) and the American Society of Hematology (ASH) jointly developed guidelines for anemia management, with an emphasis on systematic, rigorous, and objective methodology (Rizzo et al., 2002). The guidelines were submitted to the Agency for Healthcare Research and Quality, to be used in conjunction with its evidence-based practice centers. The guidelines provided rationale for each recommendation. The ASCO and ASH guidelines for the use of ESAs in patients with cancer recommended the use of the agents in patients with chemotherapy-induced anemia who have hemoglobin <10 g/dl. Transfusions of red blood cells also may be necessary, depending on the severity of anemia. For patients with mild anemia (hemoglobin is 10–12 g/dl but has never fallen below 10 g/dl), decisions on the use of erythropoietic therapy should be determined by clinical circumstances, such as comorbid conditions that might increase the probability that such patients will become anemic or that suggest the possibility of more severe anemia.

The recommended epoetin alfa dosage, based on common clinical practice, is 40,000 units weekly (Ortho Biotech Products, L.P., 2007; Rizzo et al., 2002); the recommended darbepoetin alfa dose is 2.25–4.5 mcg/kg per week (Amgen Inc., 2007). Criteria for dose escalation include a failure to achieve at least a 1 g/dl increase in hemoglobin concentration over baseline values and a reticulocyte count <40,000/µL by the fourth week of treatment. In the absence of a response, defined as a 1–2 g/dl increase in hemoglobin concentration after six to eight weeks, treatment should be discontinued. Nonresponders should be assessed for tumor progression and iron deficiency.

Total iron, TIBC, transferrin saturation, and ferritin should be monitored regularly to help healthcare professionals determine when to use erythropoietic therapy appropriately, maximize symptomatic improvement for patients, and better understand the reason for nonresponse to treatment (see Table 1 for a description of the laboratory values). A sample standing order addressing the use of ESAs, based on evidence-based guidelines, is shown in Figure 3 (NCCN, 2007a; Rizzo et al., 2002). It may be adapted to suit clinical protocols at individual institutions.

The ASCO and ASH guidelines concluded with treatment recommendations for patients with myeloma, non-Hodgkin lymphoma, and chronic lymphocytic leukemia who experience chemotherapy-associated anemia. The guidelines suggested that treatment of patients with those diseases who are receiving chemotherapy should be in accordance with the recommendations described earlier. The evidence-based ASCO and ASH clinical practice guidelines provide oncology nurses with a helpful tool for evaluating the levels of evidence when gathering information to create practice guidelines. Information that is extrapolated from a meta-analysis of several well-designed studies (i.e., studies that were experimental and randomized and included control groups) is more easily generalized to patient populations than information taken from individual case studies or clinical examples.

Implementation

Taken together, the clinical practice guidelines can lead to the development of a practice algorithm, as shown in Figure 3. Implementation of the algorithm in a clinical setting constitutes a standing order for the amelioration of cancer treatment-associated anemia.

Conclusion

Standing orders empower oncology nurses to provide safe, timely, effective, high-quality patient care. They benefit healthcare teams by providing nurses with the autonomy to follow preapproved physicians’ orders and by recognizing nurses’
expertise in assessing patients and intervening as appropriate. Standing orders written to conform to research-based guidelines and well-researched protocols provide the best possible care for patients, reflecting evidence-based principles while minimizing variations in practice. Despite the availability of a multitude of evidence-based practice guidelines for the management of cancer-related anemia, relatively few institutions have developed standing orders for the identification and treatment of patients with anemia. Oncology nurses can demonstrate their professional commitment to best practice by coordinating and participating in the development of standing orders at their institutions and by implementing the standing orders to provide consistent care for their patients.

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References

**Figure 3. Sample Standing Order Algorithm**

*Note*. Documentation required by Medicare: serum iron ÷ total iron-binding capacity = transferrin saturation; transferrin saturation (must be 20% or higher); serum ferritin (must be 100 ng/ml or higher); hemoglobin (< 12 g/dl); hematocrit (lower than 36%–40%); serum creatinine

*Note*. In patients with hemoglobin concentration < 12 g/dl that has never fallen below 10 g/dl, clinical circumstance should dictate whether to implement erythropoietic treatment immediately or to continue observation.

*Note*. Based on information from National Comprehensive Cancer Network, 2007a; Rizzo et al., 2002.
