# Development and Implementation of a Risk Assessment Tool for Chemotherapy-Induced Neutropenia

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**Purpose/Objectives:** To evaluate a tool developed and implemented to help practitioners assess the risk of chemotherapy-induced neutropenia (CIN) and its complications in patients with nonleukemia cancer types.

**Design:** Retrospective survey of chart records.

**Setting:** Community-based oncology practice.

**Sample:** The medical records of 85 adult patients treated with new courses of chemotherapy, regardless of the cancer type or stage; 50 charts belonged to patients treated before the implementation of the tool and 35 to patients evaluated with the tool.

**Methods:** A risk assessment tool for CIN that was developed using risk factors from published studies and national guidelines was implemented. Patients who were found to be at increased risk for CIN were given colony-stimulating factor (CSF) support starting with the first chemotherapy cycle. The effectiveness of the tool was evaluated by comparing clinical outcomes before and after the implementation of the risk assessment tool.

**Main Research Variables:** Febrile neutropenia, IV antibiotic use, hospitalization for neutropenia, and chemotherapy dose reductions and delays.

**Findings:** Chemotherapy dose delays, febrile neutropenia, treatment with IV antibiotics, and hospitalization for neutropenia occurred less frequently in patients assessed with the tool and managed with the algorithm for CSF use than in those who were not assessed.

**Conclusions:** The Risk Assessment for Neutropenic Complications Tool is effective in helping practitioners determine which patients are at high risk for CIN and its complications.

**Implications for Nursing:** By using the tool to identify patients treated with chemotherapy who need growth factor support, nurses can help to reduce the incidence of neutropenia and its complications.

## Key Points . . .

- ➤ Chemotherapy dose reductions and treatment delays can compromise treatment outcomes, whether the goal is cure, prolongation of survival, or palliation.
- ➤ Chemotherapy-induced neutropenia is one of the main reasons for dose modifications.
- ➤ Identifying patients at increased risk for chemotherapy-induced neutropenia with a risk assessment tool will help oncology nurses target appropriate supportive care to patients who are most likely to benefit from it.

Neutropenia, the most common dose-limiting toxicity in patients with cancer treated with myelosuppressive chemotherapy, is associated with numerous negative consequences (Crawford, Dale, & Lyman, 2004). Patients with chemotherapy-induced neutropenia (CIN) are at increased risk for life-threatening infections, and the risk is greatest when the absolute neutrophil count (ANC) is less than 500/mm$^3$ (Bodey, Buckley, Sathe, & Freireich, 1966). Infection in patients with neutropenia often manifests only as fever (i.e., febrile neutropenia). Febrile neutropenia not only has negative clinical consequences, but it also has substantial economic effects and consequences on patients' quality of life (QOL). Because the rates of hospitalization for febrile neutropenia are high and the durations of hospitalization are long, febrile neutropenia puts a significant economic burden on the healthcare system (Caggiano, Stolshek, Delgado, & Carter, 2001; Kuderer, Cosler, Crawford, Dale, & Lyman, 2002). Studies also have found that QOL is impaired in patients with CIN (Fortner et al., 2002; Okon et al., 2002).

One method of managing or reducing the incidence of CIN is to reduce or delay doses of chemotherapy. Such dose modifications occur frequently in community oncology practices, and nationwide practice-pattern surveys of medical records have shown that 56% of patients with early-stage breast cancer and 53% with non-Hodgkin lymphoma were undertreated (Lyman, Dale, & Crawford, 2003; Lyman, Dale, Friedberg, Crawford, & Fisher, 2004). Dose reductions and delays, especially in curable tumors, can compromise treatment outcomes and long-term survival (Bonadonna & Valagussa, 1981; Budman et al., 1998; Epelbaum et al., 1990; Kwak, Halpern, Olshen, & Horning, 1990; Lepage et al., 1993). Another approach is to use supportive hematopoietic colony-stimulating factors (CSFs), which reduce the incidence, severity, and duration of CIN and

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