

FEATURE ARTICLE

Neutropenic Fever: One Institution's Quality Improvement Project to Decrease Time From Patient Arrival to Initiation of Antibiotic Therapy

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Neutropenic fever is an oncologic medical emergency requiring prompt assessment and administration of antibiotics. Although the literature does not specifically define the word “prompt,” the general belief is that the sooner antibiotics are started, the better the clinical outcome (Barber, 2001; Garcia-Carbonero & Paz-Ares, 2002; Hughes et al., 1997; Viscoli, 1998). At Dartmouth-Hitchcock Medical Center (DHMC), a 330-bed teaching hospital and tertiary care referral center in Lebanon, NH, nurses and physicians expressed concern about the length of time adult inpatients were waiting before receiving their initial dose of antibiotics on the hematology and oncology units. This was a concern because during the first 48 hours of infection in untreated patients with severe neutropenia, mortality rates have been reported to exceed 50% (Ellerhorst-Ryan, 2000; Rolston & Brody, 2000; Segal, Walsh, & Holland, 2001).

Discussions with inpatient care providers generated several hypotheses about what was causing these delays in antibiotic administration. To better understand this phenomenon, a quality improvement project was initiated to determine whether the staff's perceptions were accurate.

Cycle Time

Quality improvement literature defines “cycle time” as the length of time it takes to

Neutropenic fever is an oncologic emergency that requires prompt assessment and treatment with antibiotics. Although the term “prompt” is not defined in numbers of minutes in the biomedical literature, the literature does indicate that the sooner antibiotics are initiated, the greater the likelihood of a positive clinical outcome. At Dartmouth-Hitchcock Medical Center in Lebanon, NH, the oncology team was concerned about the length of time before adult inpatients with febrile neutropenia received their initial dose of antibiotics (cycle time). The purpose of this quality improvement project was to reduce treatment delays in patients with febrile neutropenia. A multidisciplinary team charted the existing admission process and identified three areas for improvement: (a) inpatient orders, (b) the admission communication process, and (c) multidisciplinary staff accountability. Following implementation, the hematology and oncology clinical nurse specialist completed a chart review of all patients with febrile neutropenia, which revealed a nearly 50% reduction in cycle time on the inpatient unit.

complete a task (Espanosa, 2001; Langley, Nolan, Nolan, Norman, & Provost, 1996). In an effort to determine whether systems could and should be improved, a retrospective chart review was conducted. The purpose of the chart review was to determine the cycle times from the arrival or diagnosis of febrile neutropenia for patients with the condition to the initiation of antibiotic therapy. Cycle times were reviewed for each point of entry into the healthcare system (i.e., hematology and oncology outpatient clinic, emergency depart-

ment [ED], and direct admissions to the hematology and oncology inpatient units). Thirty-one patients in the hematology and oncology units with the principal discharge diagnosis of agranulocytosis (International Classification of Disease, Ninth Revision [ICD-9], Code 288.0) or fever (ICD-9, Code 780.6) and the secondary diagnosis of agranulocytosis were identified during a five-month period. Patients were excluded on the basis of a white blood cell count greater than or equal to 4,000/mm³ or absolute neutrophil count greater than 1,000/mm³, admission to an inpatient unit other than hematology and oncology, and antibiotic therapy initiated at the transferring institution. Twenty-two patients met the inclusion criteria. Mean cycle times ranged from 70–254 minutes depending on the patients' points of entry into the DHMC system (see Table 1).

Clearly, the facility had room for improvement. A multidisciplinary team of physicians (representing the oncology, hematology, and infectious disease departments), inpatient staff nurses, an oncology clinical nurse specialist,

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