Reducing Time To Antibiotics in Children with Possible Febrile Neutropenia
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Purpose
Febrile neutropenia (FN) is a potentially life-threatening complication of immunocompromising chemotherapy in children with cancer. It is widely accepted that prompt antibiotic administration reduces morbidity and mortality associated with this condition and time to antibiotic (TTA) administration is used as a quality benchmark by many institutions.

Clinical Problem
Oncology patients with fever are at significant risk for increased morbidity and mortality (1,2)

Prompt administration of antibiotics suggests a reduction in ICU admission and mortality (3,4)

Background
2011: Pathway & order-set initiated
Average TTA: 115 → 59.9 minutes
% less than 60 minutes: 46
2014:
Average TTA: 66.6 minutes
% less than 60 minutes: 60.2

Goals of Initiative:
Decrease mean TTA to 54 minutes (10% improvement)
80% of eligible patients with TTA < 60 minutes

Evidence-Based Protocol
3 consecutive Plan-Do-Study-Act (PDSA) cycles:

- **Started**
  - April 2015
  - Decrease TTA to MD Orders after patient arrival

- **June 2015**
  - Expedite preparation and delivery from pharmacy

- **August 2015**
  - Order Antibiotics prior to patient arrival

Implementation tools:
- Education
- Audit and feedback
- Weekly quality rounds

Population:
- **Inclusion**: Pediatric Oncology Patients < 19 years old with fever, reported or measured in the Pediatric ED (>38.3°C once or >38°C x 2 in 24 hours)
- **Exclusion**: Pediatric Oncology patients receiving antibiotics at an outside facility

Results: PDSA Cycles

- **Pre**: 66 (66-79)
- **Post**: 46 (38-53)
- **Maint**: 47 (43-50)

Results: TTA

- **Pre**: 60 (60-70)
- **Post**: 53 (48-68)
- **Maint**: 58 (52-63)

Implications for Emergency Nursing Practice
- Interdisciplinary collaboration (pharmacy, nursing, PEM physicians, oncology team, and quality team) on quality initiatives, such as this, helps minimize morbidity and mortality.
- Evidenced based pathways and delegated order-set helps with emergency nursing autonomy and efficiency, but in this vulnerable population it is key to continually assess and re-assess for signs of septic shock, dehydration, and/or respiratory distress.
- Continuous family education on the importance of CLABSI prevention and TTA and seeking emergent care when neutropenic is key.

Discussion/Conclusion
- PDSA cycles may be used effectively to decrease TTA to < 60 minutes for the large majority of patients with possible febrile neutropenia. We successfully decreased TTA to 46.5 minutes from 66 minutes and increased the overall percentage of patients receiving antibiotics in <60 minutes.
- Layers of redundancy help achieve and maintain success—maintained our gains in TTA and % receiving antibiotics in <60 minutes; consistency of pre-ordering is varied and about 40%
- Limitations: QI initiative at a single center, academic medical center, where referral calls of in-coming patients is routine practice.
- Next Steps: Pediatric oncology patients with an indwelling central line are at increased risk for sepsis and central-line associated infections (CLABSI) and the risk increases with neutropenia. To help ensure a standard, evidenced based approach is being followed within our TTA time frame, our hospital developed a K-card based upon the hospital CLABSI Bundle. The K-card is done by a second nurse during every central-line or port-a-catheter access.

References