BACKGROUND

- Sepsis is a significant public health concern, accounting for more than $20 billion (5.2%) of total US hospitals costs in 2011.
- In 2015, CMS added the SEP-1 Sepsis Core Measure and began penalization in October 2016, with the overall goal of decreasing mortality due to sepsis.
- Evidence shows a mortality benefit in patients identified with sepsis who receive appropriate broad spectrum antibiotics within one hour of suspected new sepsis.
- At BMC, the mortality of patients who developed sepsis as inpatients varied greatly each month but was higher than the expected amount calculated, and as compared to all patients with sepsis (i.e. including those arriving in the ED with sepsis and those who developed sepsis in the hospital)
- On the inpatient medical wards at BMC, a chart review and data analysis demonstrated that the time to first antibiotic administration was averaged at 2 hours using a time 0 of documentation of first vital sign change, which is 100% higher than what is recommended per recent guidelines.

AIM

- The goal of this hospital-wide initiative was to identify workflow issues to improve the timely recognition of sepsis on the medical floors (vs the ED), and improve system protocols to appropriately manage these patients since the literature demonstrates mortality benefits in timeliness of antibiotic administration.
- Since evidence shows a reduction in mortality with timely antibiotic administration, we set a goal to decrease average time to first antibiotics by 50% (from 2 to 1 hr) in patients on the medical services diagnosed with sepsis.

METHODS: WORKFLOW ASSESSMENT

- Real-time chart review of all cases identified as sepsis based on ICD coding occurring on inpatient medical teams (general medicine, hospitalist, family medicine).
- Identify workflow for key stakeholders: primarily pharmacists and residents; and assess for target areas of improvement.
- Outcome measure: Time to first antibiotic dose
  - T0 = first documentation of fever > 100.4 F (38.0 deg C) and >2- HR>100, RR>20, SBP<90
- Process measures:
  - Time between initial documentation of vital sign changes and time when first abs ord written
  - Time when Early Warning System Score (EWS) > 5 is identified
  - Time between abs ord written and MAR documentation time of administration of first abs dose (surrogate for when abs given)
  - Balance measure: Inapplicable abs use – measure any change in adverse drug events related to antibiotic use through data extraction and chart review

INTERVENTIONS

- There were many workflow processes to target to help improve antibiotic administration time in patients suspected of developing sepsis on the wards
- Multiple interventions were targeted, including:
  - New education modules for nursing regarding identification and documentation change in mental status (i.e. delirium)
  - New Sepsis Order Panel in Epic EHR
  - Campaign to advertise new Epic Order Panel – morning report sessions, flyers posted in all team rooms to educate residents, include in orientation materials, partner with resource nurses
  - PDSA to focus on utilization of new Order Panel
  - Order Panel included Sepsis identification education (SIRS, QSOFA), easy ordering of elements of the SEP 1-3 h bundle, including lactate, blood cultures, broad spectrum abx, and IVF all STAT

RESULTS THUS FAR

- Time to abs administration varied between vancomycin and ceftepime
  - Mean time to abs for cephepine: 72 min; vs vancomycin: 102 min
  - Stable use of sepsis order panel since go-live date 5/24/2017
  - Potential association b/w ↓ in abs time after go-live of Sepsis Order Panel

CONCLUSION & NEXT STEPS

- There are many initiatives being implemented to improve sepsis mortality through reducing abs administration time to within 60 min of T0
- The Sepsis Order Panel is resident-driven, as medical providers must order the correct lab tests and antibiotics for patients
- We will continue to improve utilization of the Sepsis Order Panel through an advertisement campaign using detailed flyers and educational conferences for sepsis (such as patient safety incident cases)
- Measure utilization of the Order Panel and promote utilization by resource nurses
- Targeted engagement with pharmacy and nursing to further reduce time between ordering antibiotics and their administration
- Consider implementing a "Code Sepsis" team to help further streamline workflow processes, include more interdisciplinary sepsis education among house staff, students, and nursing, and promoting utilization by resource nurses
- Early Warning System (EWS) score pilot initiated 9/25/17 to target "at-risk" patients for developing sepsis, using real-time chart review by nursing to signal evaluation for infection by resource nurses and care team