Jefferson Health

Balancing Early Antibiotic Administration and Stewardship in Sepsis

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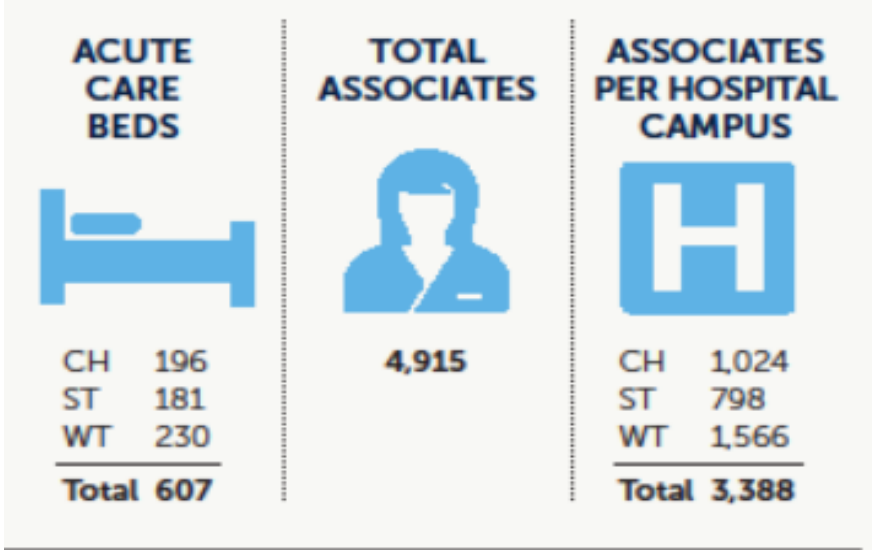
Financial Disclosures

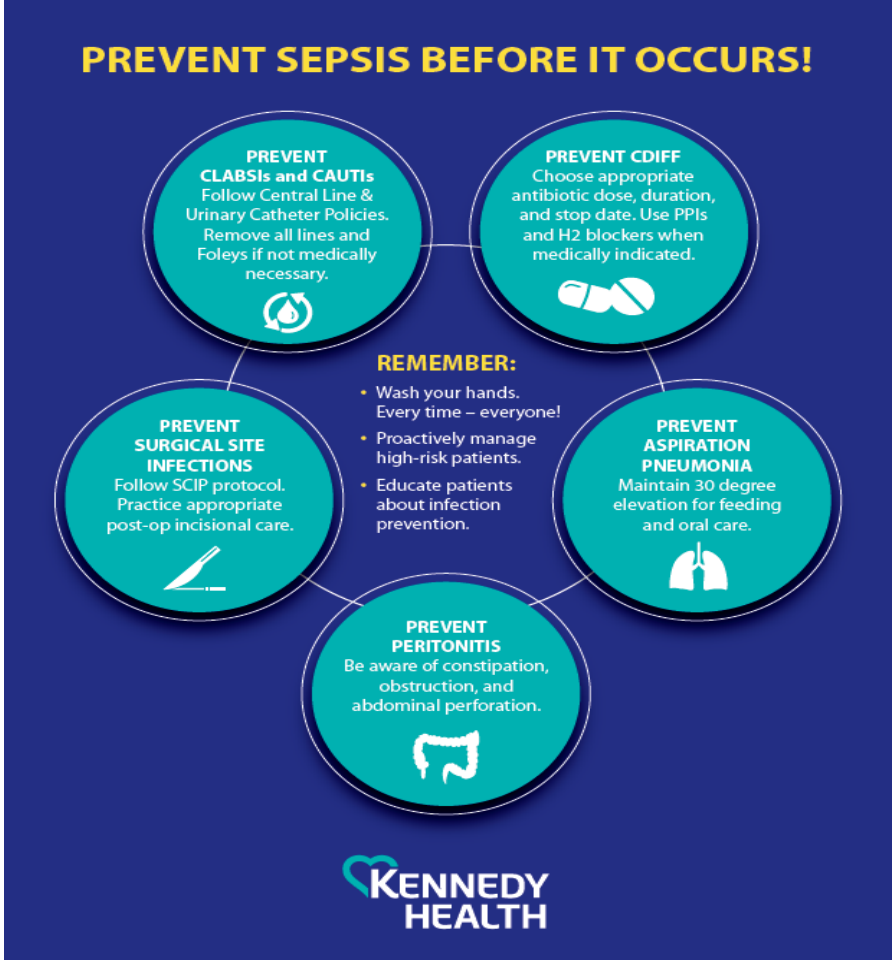
- **I have nothing to disclose.**

Jefferson Health - New Jersey, About Us

- Formerly Kennedy Health.
- Located in South Jersey.
- 2017 Overview:
  - Total Revenue = $635.3 M
  - Charity Care = $10.4 M
  - Capital Improvements = $51.2 M
- 607 total acute care beds:
  - Jefferson Cherry Hill Hospital (CH)
  - Jefferson Stratford Hospital (ST)
  - Jefferson Washington Twp. Hospital (WT)



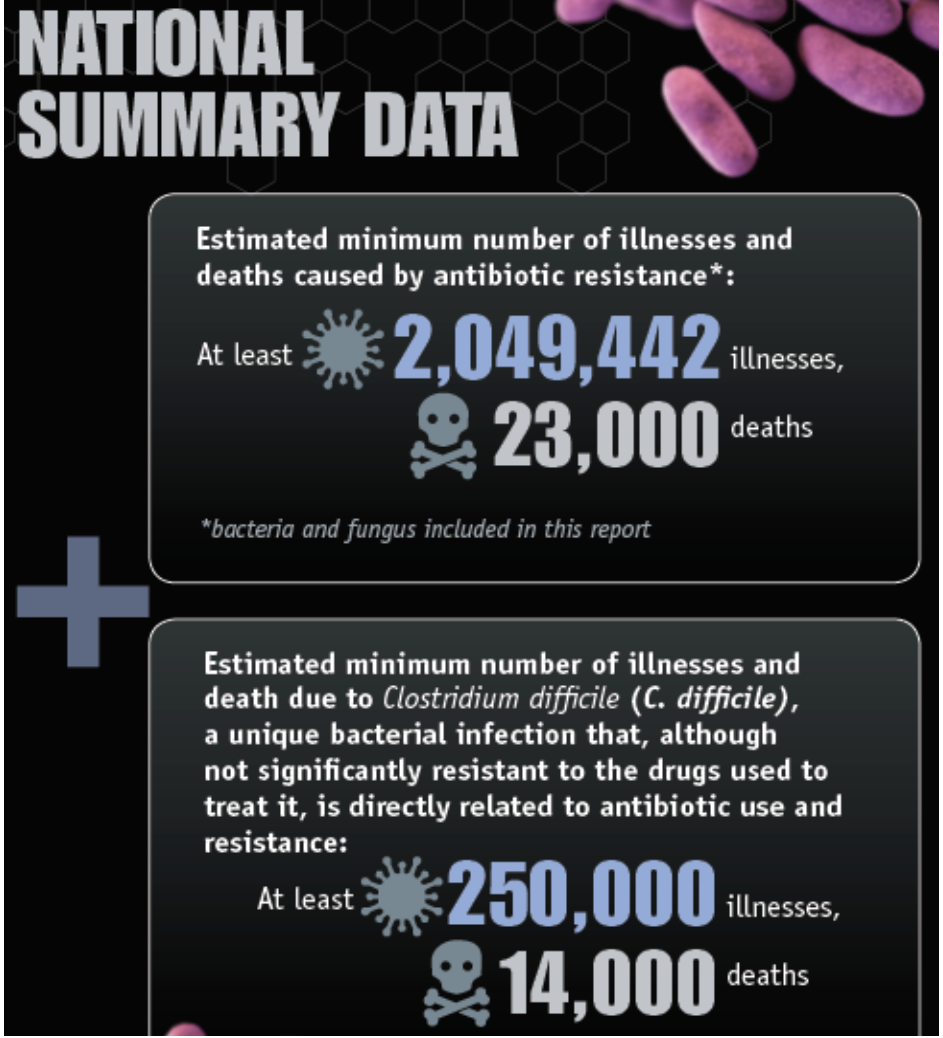
Antibiotic Stewardship, Sepsis and Infection Prevention: Interrelated Roles


PREVENT SEPSIS BEFORE IT OCCURS!
PREVENT CLABSIs and CAUTIs
Follow Central Line & Urinary Catheter Policies. Remove all lines and Foleys if not medically necessary.
PREVENT CDIFF
Choose appropriate antibiotic dose, duration, and stop date. Use PPIs and H2 blockers when medically indicated.
REMEMBER:
• Wash your hands. Every time – everyone!
• Proactively manage high-risk patients.
• Educate patients about infection prevention.
PREVENT SURGICAL SITE INFECTIONS
Follow SCIP protocol. Practice appropriate post-op incisional care.
PREVENT ASPIRATION PNEUMONIA
Maintain 30 degree elevation for feeding and oral care.
PREVENT PERITONITIS
Be aware of constipation, obstruction, and abdominal perforation.
KENNEDY HEALTH

Prevention of CRE

- Hand hygiene
- Contact precautions if infected/colonized with CRE
- Minimize use of devices (ventilator, central line)
- Antimicrobial stewardship
- Environmental cleaning

www.cdc.gov/hai/pdfs/cre/CRE-guidance-508.pdf



https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf

Antimicrobial Stewardship, Defined

- Infectious Diseases Society of America (IDSA):
  - "…coordinated interventions designed to improve and measure the appropriate use of antimicrobials by promoting the selection of the optimal antimicrobial drug regimen, dose, duration of therapy, and route of administration."
  - *Antibiotic dose, duration, and route for a specific indication.*
- In the hospital, decrease chances of acquisition of MDRO and decrease hospital-acquired CDI & improve patient outcomes.

Mandell: Infectious Diseases Textbook - Chapter on CDI – Risks for CDI

- Any antibiotic
  (compared to no antibiotic)
- Number of antibiotics
  (more antibiotics = higher risk)
- Days of antibiotics
  (more days = higher risk)
- Type of antibiotic
- Proton-pump inhibitors and histamine type 2 blockers
- Duration of hospitalization
- Patient age (increased with age)
- Long-term care residency
- Severity of underlying illness
- Abdominal surgery
- Nasogastric tube
- Prior hospitalization

Antimicrobial Stewardship:
Admission through Discharge

AT ADMISSION

- Source of the infection
- Labs, cultures & studies
- Review old cultures
- Clarify antibiotic allergies
- Age/Cr/seizures/QTC
- Antimicrobial selection based on most likely source/pathogen(s)

HOSPITAL COURSE

- **Antibiotic Time-Out:** Antimicrobial necessity
  - If NO infection, STOP
- De-escalate antimicrobials to most narrow spectrum based on culture results, if available
- Antimicrobial dose, duration, and stop date based on site of infection

AT DISCHARGE

- **Medication Reconciliation**
  - Assess necessity for antimicrobials, narrow spectrum, dose, duration, and stop date
- If antimicrobials are no longer needed, **STOP**
- Counsel patient on taking antimicrobials as prescribed

Kennedy Health, CDiff Task Force, 2015

MK.520 - 05/2015

KENNEDY UNIVERSITY HOSPITAL

The Right Antibiotic Makes a Difference!

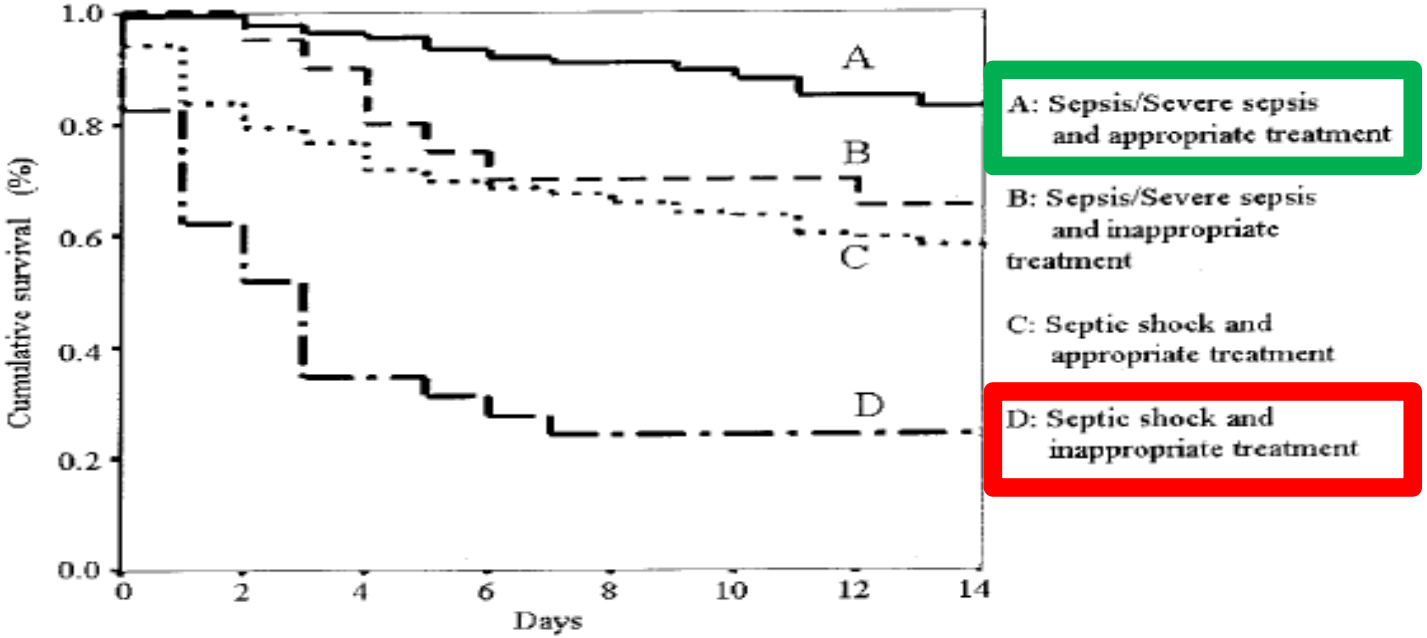


FIGURE 2. Survival rate according to the presence of shock and empiric antibiotic treatment (log-rank test, $p < 0.001$).

CHEST 2003; 123:1615–1624

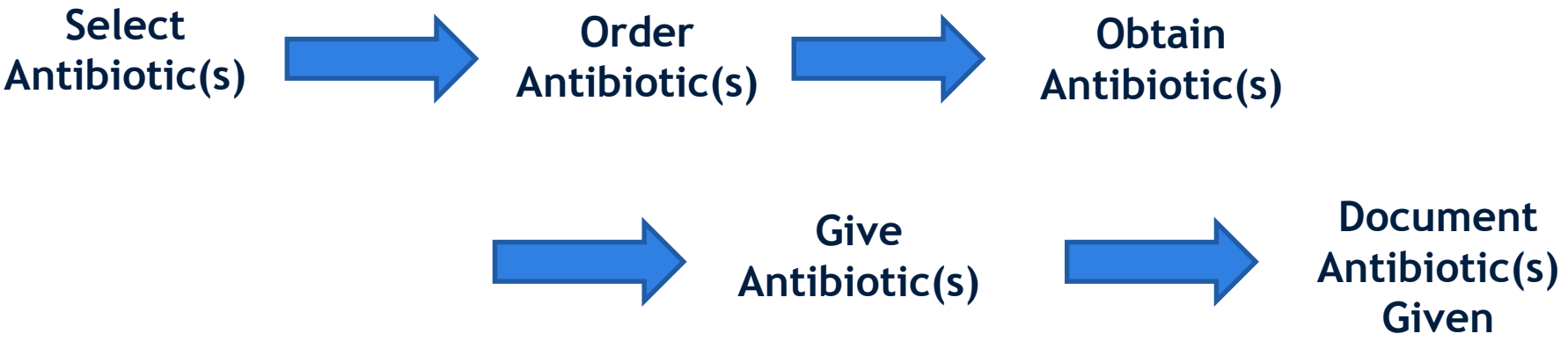
The Right Time Makes a Difference!

- 35,000 ED Patients.
- 21 ED.
- 2010-2013, California.
- Sepsis patients within 6 hrs of ED Registration.
- Looked at in-hospital mortality.

- Median time to antibiotic = 2.1 hours.
- Increase in absolute mortality after hr-delay = 0.3% for sepsis, 0.4% for severe sepsis, and 1.8% for shock.

Am J Respir Crit Care Med. 2017 Oct 1;196(7):856-863. doi: 10.1164/rccm.201609-1848OC.

Antibiotic Administration and Coordination in Sepsis



Impact of Regulatory/CMS

- Positives.
  - Improved bundle compliance.
  - Hospital Compare.
- Negatives.
  - Time to find the source of the infection.
  - Possibility of sterile cultures from prior antibiotic exposure.
  - Antibiotic exposure - risk of CDI.

CDC and Resistance

- Antibiotic use -> biological pressure -> bacteria develop resistance.
- 50% of the time - inappropriate use of antibiotics -> promotes antibiotic resistance.
- Promote antibiotic stewardship and help preserve antibiotic for the future.

https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf

IDSA Concern on sepsis vs. non-infectious syndromes

- 40% to ICU with sepsis do not have infection/sepsis.
- Difficulties with diagnosis of infection, whether organ dysfunction is due to sepsis.
- The Surviving Sepsis Campaign Guidelines – consider differentiation of patients with *suspected sepsis* and *suspected septic shock*.
    - Infection (bacterial vs. viral) vs. non-infection vs. unclear.
    - Stable vs. unstable.
    - Potential harms to the patient/general population.

Clinical Infectious Diseases® 2018;66(10):1631–5

Sepsis Cascade

SIRS CRITERIA WITH INFECTION

SEPSIS AND ORGAN DYSFUNCTION LACTIC ACID ≥ 2

SEVERE SEPSIS WITH BP REFRACTORY TO 30 cc/kg, PRESSOR(S) LACTIC ACID ≥ 4

To give or not to give (antibiotics)…

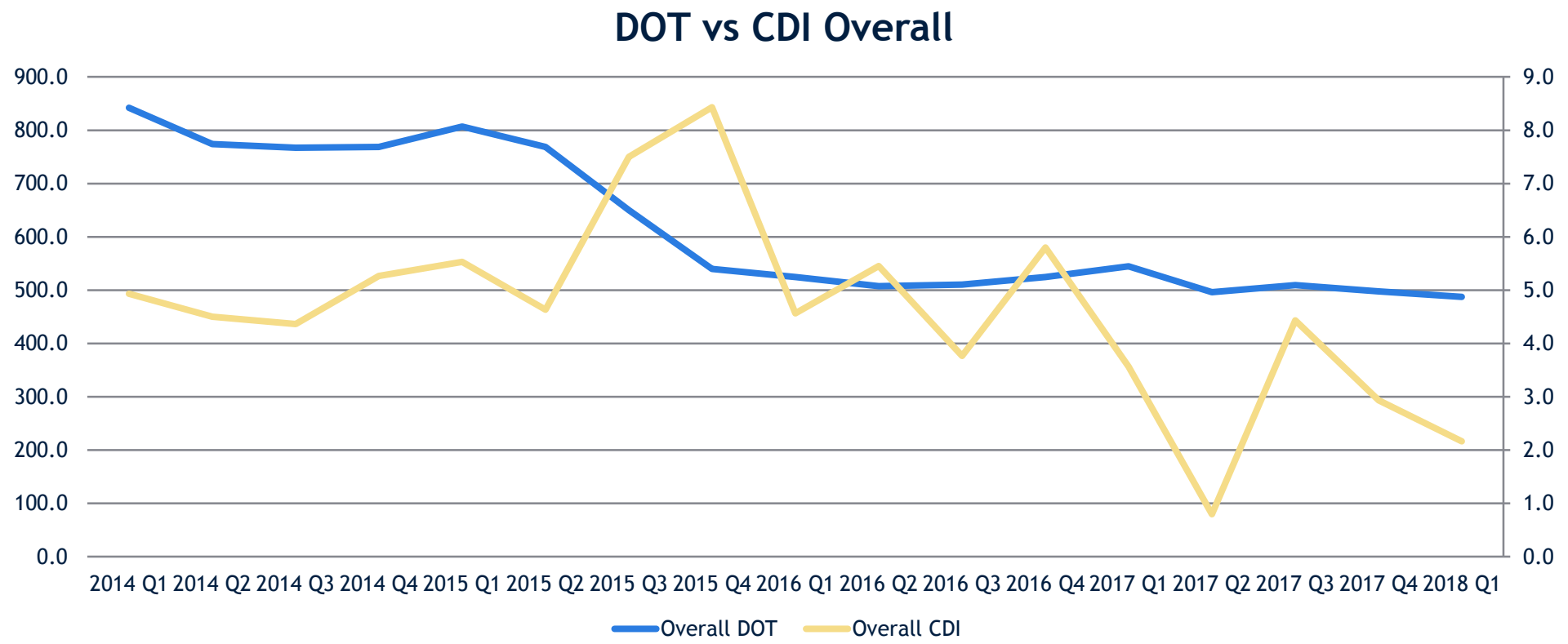
- History -> physical examination -> selective labs/studies.

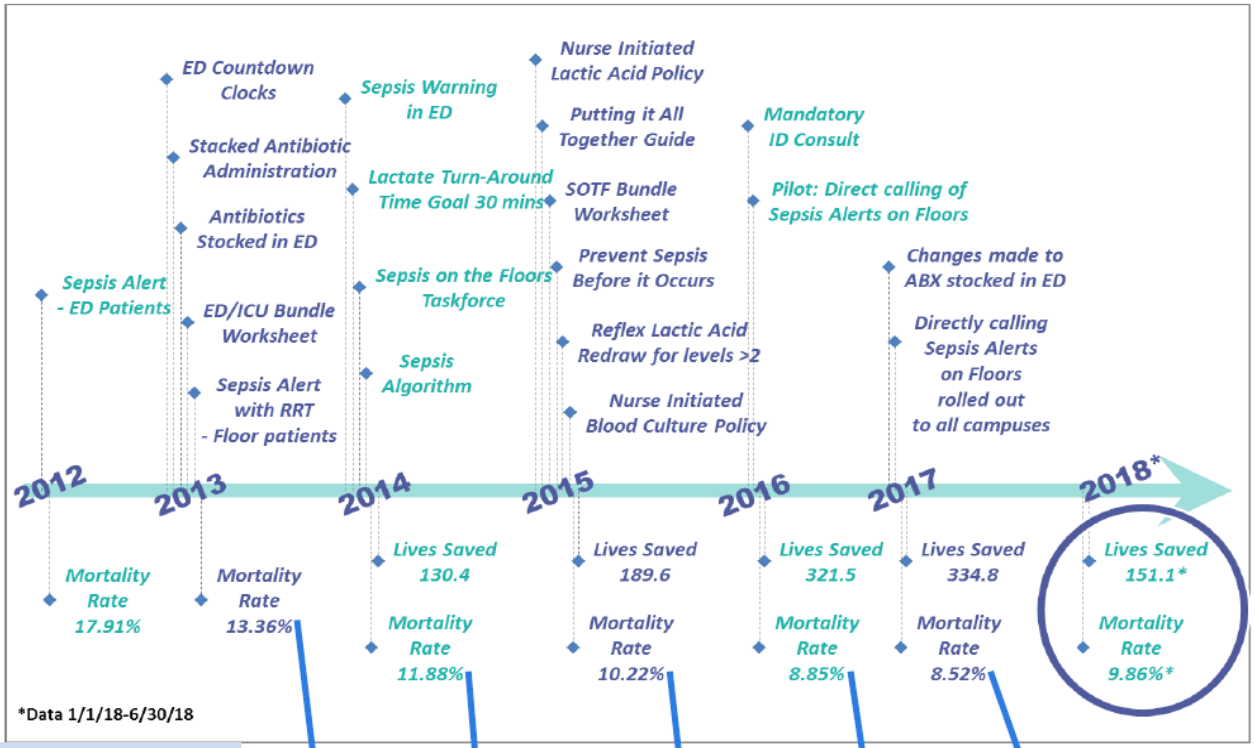
- Differential diagnosis.

- Scroll down the page for all of the labs/studies.
- The right clinical context.
- The urgency in the setting of hemodynamic instability.

Outcomes Data from Jefferson Health - New Jersey

Jefferson Health New Jersey Data





Lives Saved 2014 - Present = 1127.5

Mortality Rate percentage decrease from baseline for each year:

25.4% 33.7% 42.9% 50.6% 52.4%

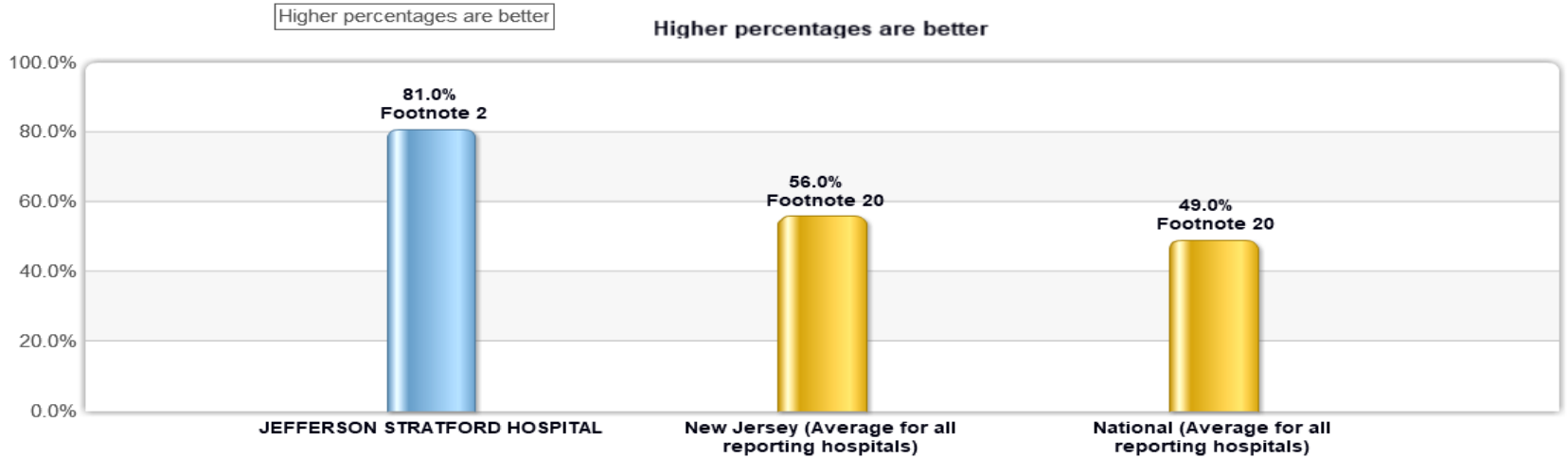
2015-2017 data refreshed using Crimson template which auto-updates with ICD-10 coding. For 2015, the ICD-9 template utilized per advise of the Crimson advisor, as it maps the corresponding ICD-10 coding for the 4th quarter.

Hospital Compare Data - Jefferson-ST = JH-NJ

Percentage of patients who received appropriate care for severe sepsis and septic shock.

Why is this important?

Hide Graph



For this measure, the rate for the top 10% of hospitals was 76%.

[2] Data submitted were based on a sample of cases/patients.
[20] State and national averages do not include VHA hospital data.

Contact

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HOME OF SIDNEY KIMMEL MEDICAL COLLEGE