UWTASP

tele-antimicrobial stewardship program

October 19, 2021

Agenda

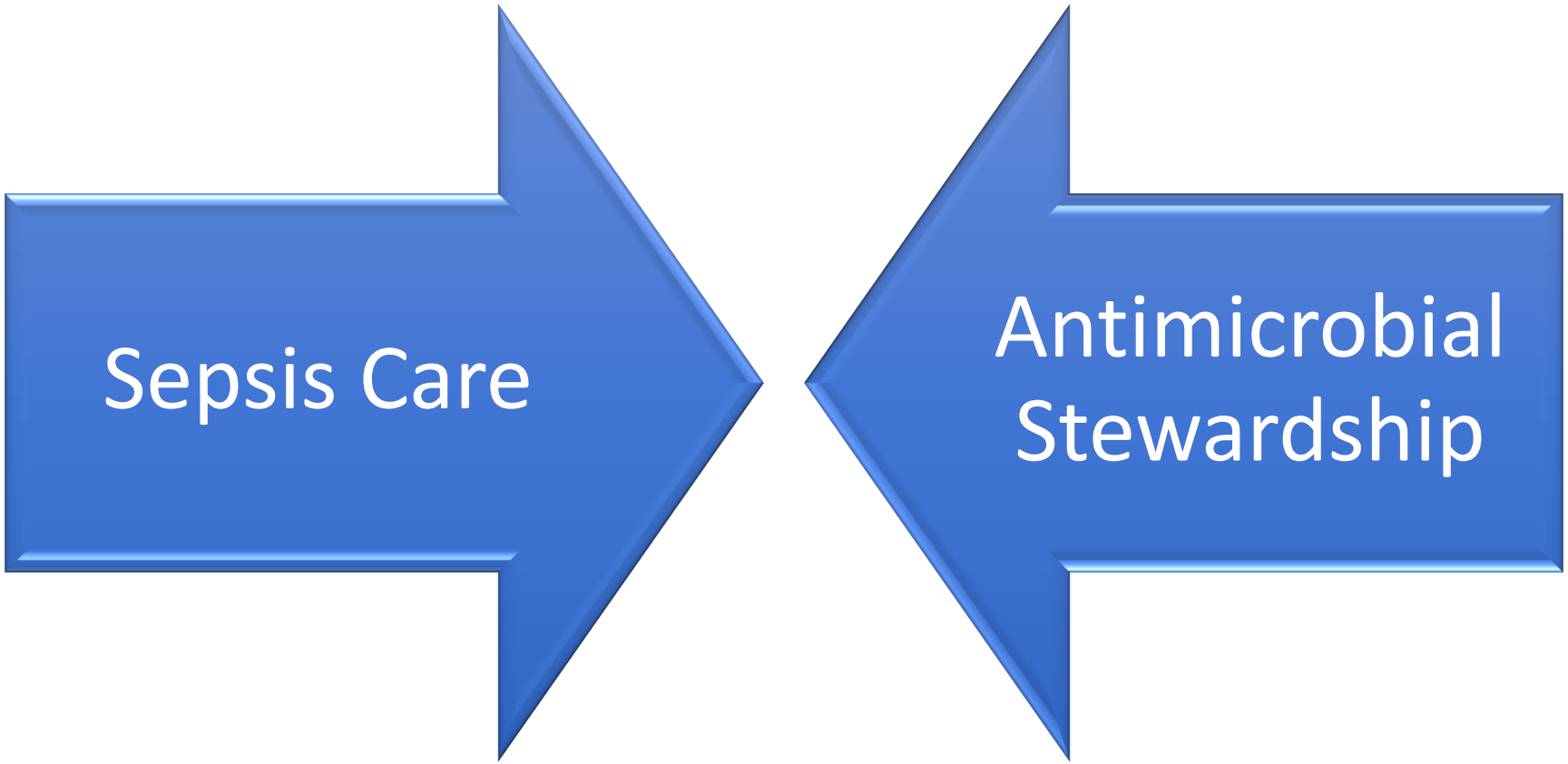
- Didactic: De-Escalation Principle

What is De-Escalation?

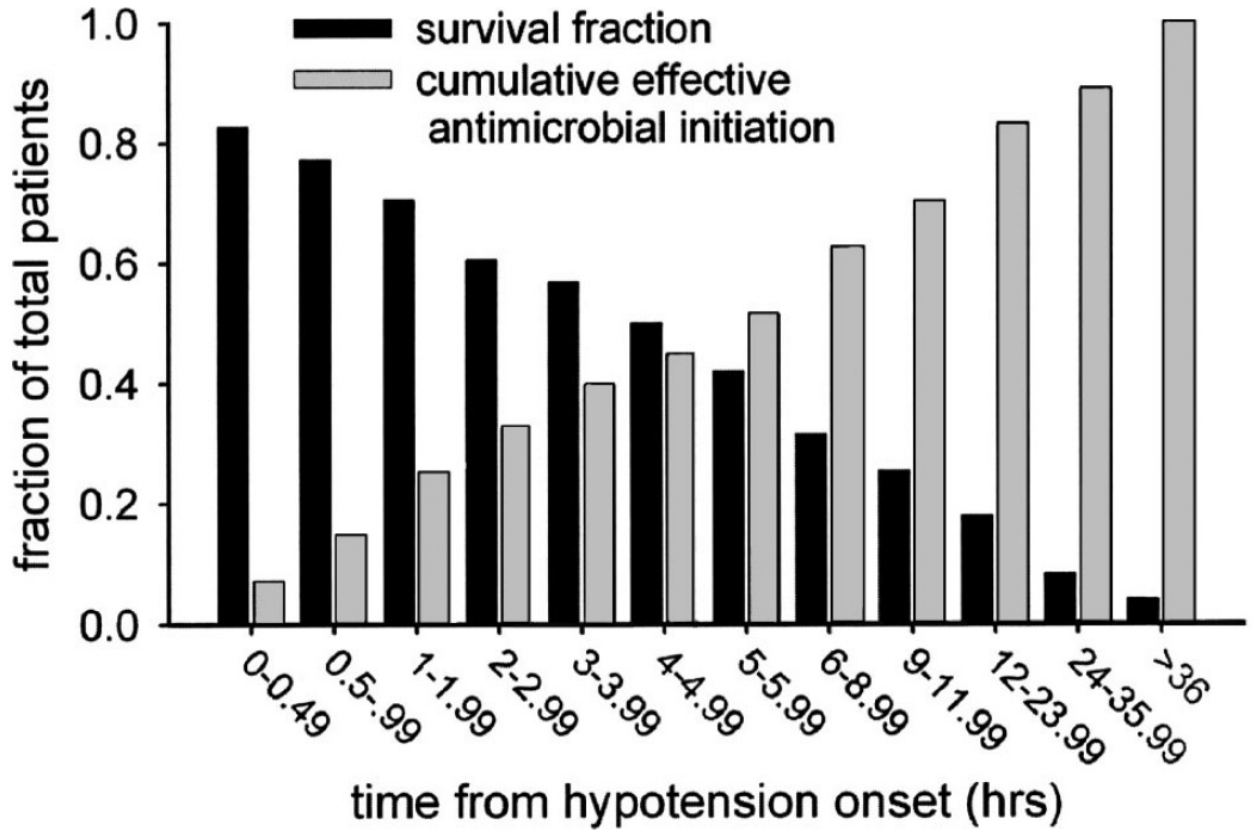
- Discontinue redundant antibiotics
  - Duplicate anaerobic coverage
  - Duplicate anti-pseudomonal coverage
- Discontinue unnecessary antibiotics
  - Stopping vancomycin for pneumonia after MRSA nares swab = neg
- Switch from IV to PO
  - Levofloxacin IV to PO
  - Ceftriaxone IV to Cephalexin PO
- Spectrum De-escalation
  - Cefepime to ceftriaxone

Jeffres, Meghan. “Controversies in Antimicrobial Stewardship”. IDWeek 2021.

Situation:



Effective Antimicrobial Therapy is Critical Determinant of Survival in Septic Shock



Each hour of delay in antimicrobial administration over the ensuing 6 hrs was associated with an average decrease in survival of 7.6%.

Kumar A, Roberts D, Wood KE, et al. Crit Care Med 2006;34(6):1589-96.

CMS Sepsis Criteria

Specifications Manual for National Hospital Inpatient Quality Measures
Discharges 01-01-18 (1Q18) through 06-30-18 (2Q18)

What if I’m wrong?

AAC
Journals.ASM.org

Stratification of the Impact of Inappropriate Empirical Antimicrobial Therapy for Gram-Negative Bloodstream Infections by Predicted Prognosis

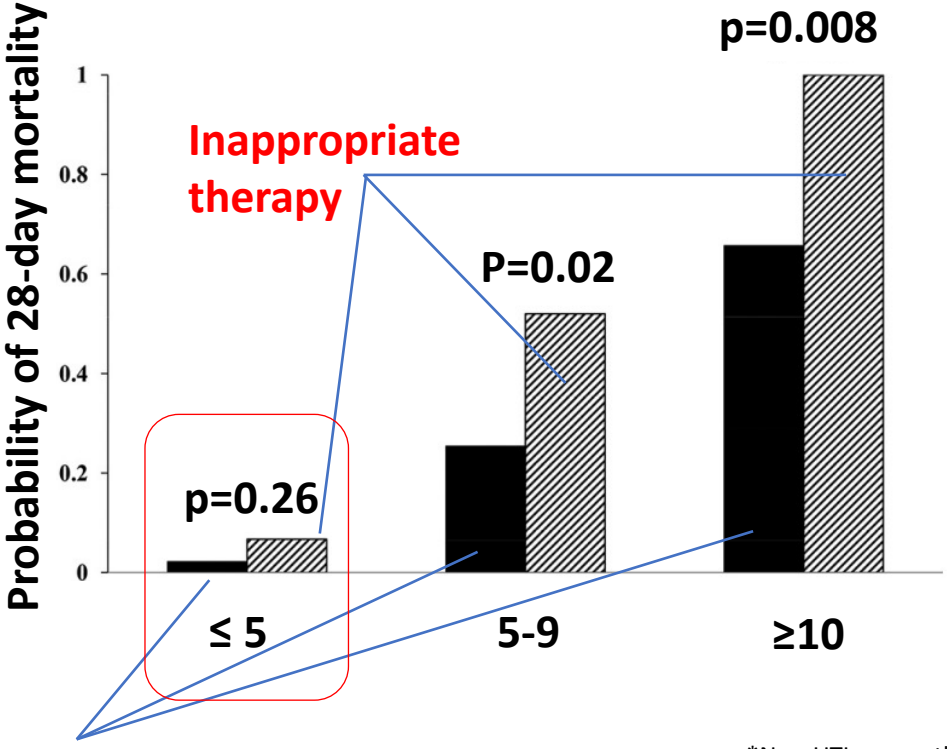
Sarah E. Cain,[a] Joseph Kohn,[b] P. Brandon Bookstaver,[c] Helmut Albrecht,[d] Majdi N. Al-Hasan[d]

University of South Carolina School of Medicine, Columbia, South Carolina, USA,[a] Department of Clinical Pharmacy, Palmetto Health Richland, Columbia, South Carolina, USA,[b] Department of Clinical Pharmacy and Outcomes Science, South Carolina College of Pharmacy, University of South Carolina, Columbia, South Carolina, USA,[c] Department of Medicine, Division of Infectious Diseases, University of South Carolina School of Medicine, Columbia, South Carolina, USA,[d]

We examined the overall impact of inappropriate empirical antimicrobial therapy on 28-day mortality in patients with Gram-negative bloodstream infections

Antimicrob Agents Chemother. 2015 Jan;59(1):245-50

Margin of Error Depends on Degree of Sickness



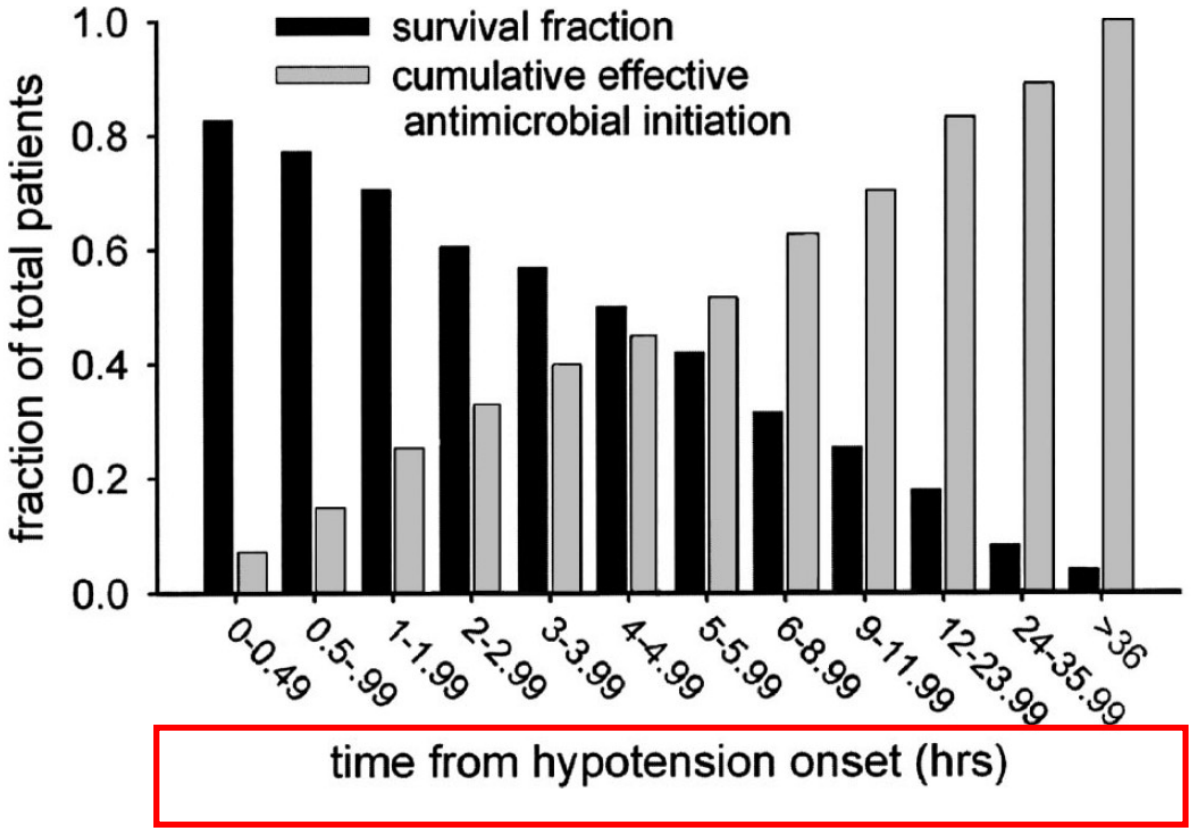
Bloodstream infection mortality score variables	Score
Malignancy	3
Liver cirrhosis	4
High-inoculum infection*	4
Pitt bacteremia score**	
0-1	0
2-3	2
≥4	5

*Non-UTI, non catheter-related bloodstream infection
**Pitt bacteremia score:
T (35.1-36 or 39.0-39.9°C, 1 point; 35 or 40°C, 2 points),
BP (hypotension, 2 points),
Mental status (disorientation, 1 point; stupor, 2 points; coma, 4 points),
Respiratory status (mechanical ventilation, 2 points), Cardiac status (cardiac arrest, 4 points)

Antimicrob Agents Chemother. 2015 Jan;59(1):245-50

Antimicrobials are Critical in Septic Shock: *The Devil is in the Details*

Each hour of delay = 7.6% decrease in survival



Kumar A, Roberts D, Wood KE, et al. Crit Care Med 2006;34(6):1589-96.

Antimicrobials are Critical in Septic Shock: Time starts with *PERSISTENT* hypotension

An episode of hypotension was considered to represent the initial onset of septic shock when:

a) hypotension persisted from onset despite fluid (>2L of saline or equivalent) administration
OR
b) Hypotension was only transiently improved (hypotension resolution for <1hr) with fluid resuscitation.

Kumar A, Roberts D, Wood KE, et al. Crit Care Med 2006;34(6):1589-96.

Does the sepsis clock in your hospital start AFTER a patient is administered IV fluids?

1. Yes
2. No
3. Not sure

No Day but Today

4% increased risk of new resistance for each additional day of ANY antipseudomonal β-lactam exposure

Increased risk of NEW resistance for each additional day of therapy

Cefepime n = 5274	8%
Piperacillin/ tazobactam n = 2463	8%
Meropenem n = 3625	2%

…When comparing a 7-day course with a 10-day course of therapy, the 10-day course is associated with a 24% increased risk of new resistance compared with the 7-day course

Pharmacotherapy 2019;39(3):261-268.

Stabilize…Diagnose…Deescalate…Duration

24-48h — **Stabilize Treat**

48-72h — **Review micro data**

>72h — **Treatment Planning**

Antibiotic optimization

Antibiotic de-escalation

Application to Practice: When to Launch

- ✓ Hemodynamically unstable

What's the Risk of Getting it Wrong?

Outpatient
Targeted antibiotics / Watch & wait

Risk of getting it wrong is low
Consider access to care/Contingency plan

Hemodynamically stable
Targeted antibiotics

Risk of getting it wrong is low but depends on individual scenario (immunocompromised pt)

Hemodynamically unstable
Broad spectrum antibiotics

Cover broadly
Considering patient history & risk

Application to Practice: Value of Spectrum De-escalation?

624 screened patients

120 included

De-escalated N = 59

Continued tx N = 57

Impact of de-escalating therapy

Longer duration
14 vs. 10 days

Super infection
27% vs. 11%

Antipseudo abx
2 vs. 3 days

Superinfection Same index pathogen

De-escalated
7/16 (44%)

Continued
4/6 (67%)

"Spectrum de-escalation has not conclusively shown to improve patient outcomes or prevent resistance" – M.Jeffres

Jeffres, Meghan. "Controversies in Antimicrobial Stewardship". IDWeek 2021.

How should we De-Escalate?

- Discontinue redundant antibiotics
  - Duplicate anaerobic coverage
  - Duplicate anti-pseudomonal coverage
- Discontinue unnecessary antibiotics
  - Stopping vancomycin for pneumonia after MRSA nares swab = neg
- Switch from IV to PO
  - Levofloxacin IV to PO
  - Ceftriaxone IV to Cephalexin PO
- Spectrum De-escalati
  - Cefepi

****Focus on Duration****

Jeffres, Meghan. “Controversies in Antimicrobial Stewardship”. IDWeek 2021.