





Health Quality Innovation Network

HQIC Office Hours

April 11, 2024

Logistics – Zoom Meeting



To ask questions, click on the **Chat** icon. At the end of the presentation, you will also be able to unmute to ask a question verbally.

You may adjust your audio by clicking the caret next to the **Mute** icon.

Resources from today's session will be shared after the call.



Sepsis and Antimicrobial Stewardship

Health Quality Innovation Network

Today's Presenter



Cindy Hou, DO, MA, MBA, CIC, CPHQ, FACOI, FACP, FIDSA
Chief Medical Officer of Sepsis Alliance
Medical Advisor for Sepsis Innovation Collaborative

Learning Objectives

- 1** Use critical thinking skills in developing an accurate history and physical examination as to the cause of the infection behind sepsis.
- 2** Select the optimal antimicrobial based on the potential pathogen(s) behind sepsis without causing more harm while simultaneously recognizing that sepsis is a medical emergency.
- 3** Develop an understanding for antimicrobial stewardship as a dynamic process in the treatment of sepsis from the beginning to the end of therapy.

Sepsis and Antimicrobial Stewardship



Cindy Hou, DO, MA, MBA, CIC, CPHQ, CPPS, FACOI, FACP, FIDSA
Infection Control Officer & Medical Director of Research
Jefferson Health - New Jersey

April 11, 2024

Disclosures

- Sepsis Alliance, member of the Board of Directors, Chief Medical Officer
- Abbott, HAI Advisory input
- Grants from National Council on Aging, ANA Project Firstline and Office of Minority Health

Jefferson Health – New Jersey



CHERRY HILL • STRATFORD • WASHINGTON TOWNSHIP



Jefferson Health – New Jersey

FY22 (July 2021 - June 2022)

- **656** licensed beds
- **4,600+** employees
- **148** residents/fellows
- Key Physician Group Partners:
NJ Urology, Heart House, Advocate, Rothman

Jefferson Medical Group Primary & Specialty Care

30+ practice locations; 300+ providers

- Strengthens community's access to high-level care
- Offers an expansive range of ambulatory services
- Night & weekend hours offered at most locations
- Telehealth and telemedicine services for patient comfort in their own homes

Patients Admitted



CH	5,871
CHBH*	1,192
ST	5,946
WT	12,666

Total 25,675

Emergency Dept. Visits



CH	38,778
ST	34,920
WT	54,295

Total 127,993

Average Length of Stay



CH	4.7 days
CHBH*	8.1 days
ST	4.0 days
WT	4.9 days

4.9 days

Births



WT	945
----	-----

Total 945

Acute Care Beds



CH	196
ST	181
WT	279

Total 656

Employees per Hospital Campus



CH	~850
ST	~600
WT	~1,400

Total ~2,850

Total Employees



4,600+



Home Health
Visits
25,543

Same-Day Surgery



Hospitals Surgery Center

CH	2,118	CH	N/A
ST	1,557	ST	N/A
WT	2,567	WT	4,888

Total 6,242

Total 4,888

Combined

11,130

Behavioral Health O/P Visits



CH	9,621
ST	N/A
WT	3,270

Total 12,891

* CHBH: Cherry Hill Behavioral Health

* Statistics for Fiscal Year 2022: July 2021 - June 2022

Source: NJHA 2022 Economic Impact Report



Thomas Jefferson University

200+

Graduate & undergraduate programs

77,000+

Alumni

17 NCAA Division II teams

8,300+

Students (full/part time)

Over **\$203 million** in sponsored research awards

1,000+ Patents for new drugs, software innovations, medical devices and diagnostic tools

Data is FY23 - updated January 2024



Jefferson Health

5,963

Credentialed physicians (2,317 are employed)

17 Hospitals

9,600+

Nurses (full/part time)

3 Nursing Magnet® designations

50+ Outpatient & urgent care locations

2 Pathway to Excellence® designations

4.8 million Outpatient visits

Data is FY23 - updated January 2024



Jefferson Health Plans

369,000+

Total members

750

Employees

13,700+

Medicare members

7,000+

ACA members

13,000+

CHIP members

35+ Years of service

335,200+ Medicaid members

Data updated January 2024

Objectives

- Utilize critical thinking skills in developing an accurate history and physical examination as to the cause of the infection behind sepsis.
- Select the optimal antimicrobial based on the potential pathogen(s) behind sepsis without causing more harm while simultaneously recognizing that sepsis is a medical emergency.
- Develop an understanding for antimicrobial stewardship as a dynamic process in the treatment of sepsis from the beginning to the end of therapy.

Sepsis

Sepsis Overview

- Sepsis is an extreme response to an infection -> **Sepsis is a medical emergency!**
- Importance to diagnose and to treat promptly as well as to identify the source of the infection
- Risks of organ dysfunction, and death

In the United States, each year

- 1.7 million impacted by sepsis
- 350,000 deaths/year



History and Physical Exam to find the source of infection or the cause of the sepsis.

- **History**
 - Symptoms reported by patient/family/friend/other.
 - Infectious review of symptoms - chills/rigors.
 - Timeline.
 - Evolution.
 - Sick contacts.
 - Travel.
 - Tick/mosquito bites.
 - Past records
 - PMH/PSH/Soc/Fam Hx.
- **Physical Exam**
 - Vital signs - T, R, BP, pain, O2.
 - Exam - don't forget the skin!
 - Toxic/nontoxic.
 - Heat/subtleties of redness.
- If not obvious, keep looking.
- Testing - targeted.

Sepsis Cascade



SIRS
CRITERIA
WITH
INFECTION



SEPSIS AND
ORGAN
DYSFUNCTION
LACTIC ACID \geq
2



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

Sepsis Bundle

Sepsis Bundle Timing

Within 3 hour
bundle

Severe sepsis

(sepsis with acute end-organ dysfunction)

- Initial Lactate (order 2nd lactate per protocol)
 - Blood cultures drawn prior to antibiotics
 - Broad spectrum antibiotics administered
- If initial Hypotension (SBP < 90 mmHg or 40 mmHg below baseline or MAP < 65 mmHg)*
- Resuscitation with 30 mL/kg crystalloid fluids*

Within 6 hour
bundle

- Repeat Lactate if first > 2, per protocol RN will discontinue the repeat Lactate if the initial Lactate is ≤ 2

Septic shock

(initial Lactate ≥ 4 or refractory hypotension)

- Initial Lactate (order 2nd lactate per protocol)
- Blood cultures drawn prior to antibiotics
- Broad spectrum antibiotics administered
- Resuscitation with 30 mL/kg crystalloid fluids*

- Repeat Lactate if first > 2, per protocol RN will discontinue the repeat Lactate if the initial Lactate is ≤ 2
- Within 6hr Note: Repeat volume status and tissue perfusion assessment is performed (.sepsis)

If hypotension persists after fluid administration

- Vasopressors

* Fluid Resuscitation adjustments

- BMI > 30, use 30 kg of **adjusted** ideal body weight (auto calc in order set) AND document in sepsis note (*or .sepsis*)
- Heart / Renal Failure document in sepsis note (*or .sepsis*)

SEP-1 and 30-Day Mortality



3,241 hospitals from 10/15 - 3/17.



Compliance - all elements of SEP-1.



If comply with SEP-1 -> lower 30 day mortality.



So, goal to reduce avoidable deaths.



[https://journal.chestnet.org/article/S0012-3692\(21\)03623-0/pdf](https://journal.chestnet.org/article/S0012-3692(21)03623-0/pdf)

SEP-1 and VBP - Calendar Year 2024 Reporting Period for FY 2026



"Adopt the Severe Sepsis and Septic Shock: Management Bundle measure in the Safety Domain beginning with the FY 2026 program year."



[FY 2024 Hospital Inpatient Prospective Payment System \(IPPS\) and Long-Term Care Hospital Prospective Payment System \(LTCH PPS\) Proposed Rule - CMS-1785-P | CMS](#)

Antimicrobial Stewardship

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
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Antibiotic selection is based on many factors



Depends on allergies



Depends on site of infection and possible pathogen(s)



Depends on healthcare associated pathogen possibility



Depends on any known renal insufficiency, body habitus



Depends on prior cultures/or potential for multi-drug resistant organism



Depends on drug-drug interactions

Inappropriate Initial Antibiotic Therapy

- <https://ccforum.biomedcentral.com/articles/10.1186/s13054-014-0596-8>

Initially **appropriate** antibiotic therapy (IAAT) - match to culture sensitivity results.

Initially **inappropriate** antibiotic therapy - 3x more likely to die.

If multi-drug resistance, higher association with inappropriate antibiotics.

Survival and Appropriateness of Antibiotics: Chest 2003; 123:1615-1624

01

Sepsis/severe sepsis and appropriate treatment - cumulative survival highest = A

02

Sepsis/severe sepsis and inappropriate treatment - cumulative survival = B

03

Septic shock and appropriate treatment - cumulative survival = C

04

Septic shock and inappropriate treatment - cumulative survival = D

ASP – Knowledge of Antibiotics

- Dose, frequency
- Cost
- Duration - stop date
- Meningeal concentration
- Adverse effects, eg. daptomycin-induced pneumonitis
- Antibiotic adjusted to culture or clinical situation
- Spectrum of coverage



NAME OF
ANTIBIOTIC -
GENERIC, BRAND
NAME



INDICATION



FORMULATION



ADVERSE EFFECTS,
EG. RASH



CLASS OF
ANTIBIOTIC

Antibiotic Terms

Empiric

Prophylactic

Definitive

Bioavailability

Source control

Impact on renal
function!

Short course vs.
long course

Step-down therapy
- IV to oral, versus
only IV then what
kind of IV

Where to get the
antibiotic and the
expense

Sensitivity results
of cultures

Antibiotics: A Risk Factor for CDiff

High Risk for CDiff

- Clindamycin (Cleocin®)*
- Ceftriaxone (Rocephin®)*
- Ciprofloxacin (Cipro®)*
- Levofloxacin (Levaquin®)*
- Cefepime (Maxipime®)
- Ceftazidime (Fortaz®)
- Cefuroxime (Ceftin®)
- Ertapenem (Invanz®)
- Meropenem (Merrem®)

* Highest Association with CDiff

Medium Risk for CDiff

- Piperacillin/tazobactam (Zosyn®)*
- Amoxicillin/clavulanic acid (Augmentin®)*
- Ampicillin/sulbactam (Unasyn®)
- Amoxicillin (Amoxil®)
- Ampicillin
- Azithromax (Zithromax®)
- Aztreonam (Azactam®)
- Cefazolin (Ancef®)
- Cephalexin (Keflex®)
- Dalfopristin/-quinupristin (Synercid®)

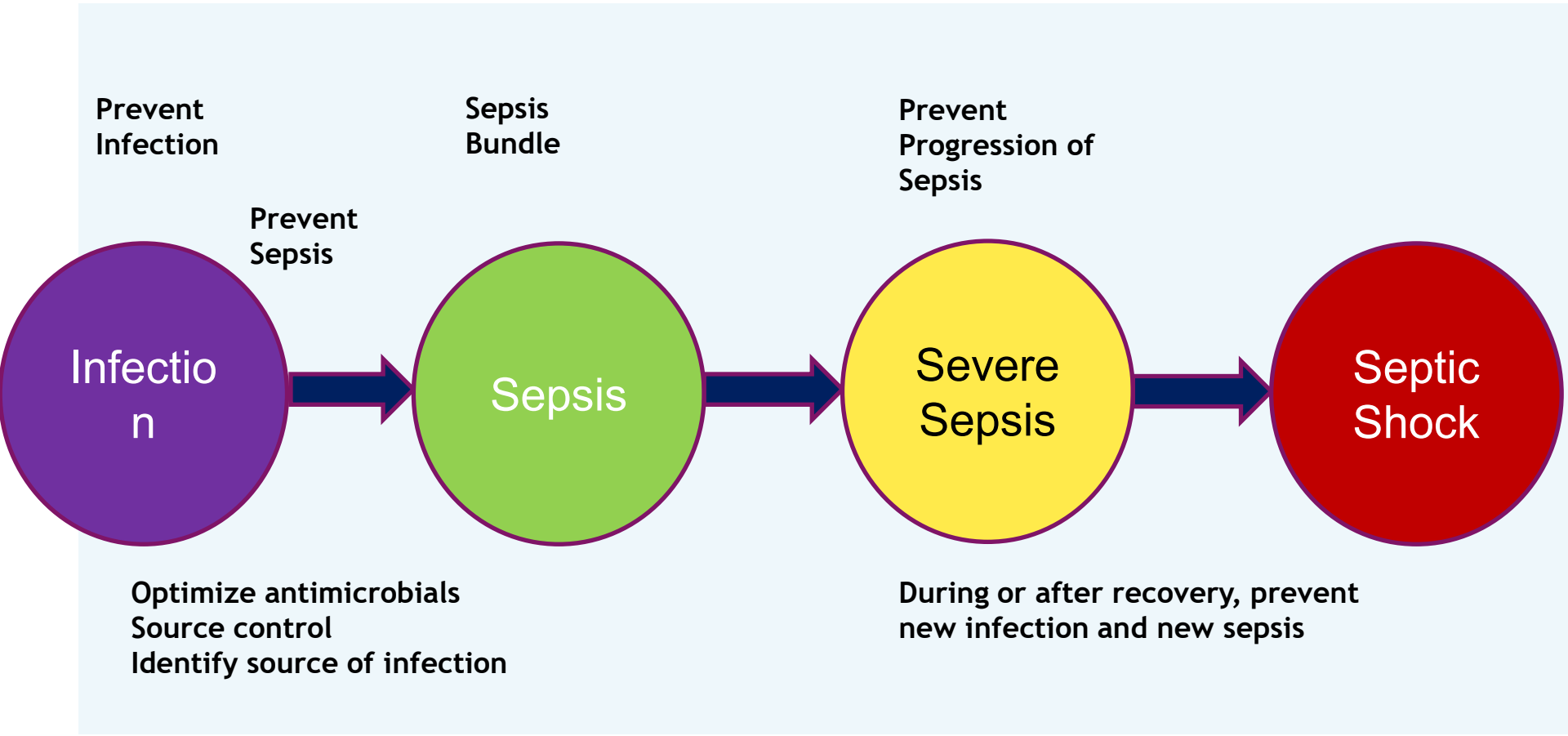
Low Risk for CDiff

- Amikacin (Amikin®)
- Daptomycin (Cubicin®)
- Doxycycline (Vibramycin®)
- Fosfomycin (Monurol®)
- Gentamicin
- Linezolid (Zyvox®)
- Nitrofurantoin (Macrobid®)
- Polymixin (Colistin®)
- Rifampin (Rifadin®)
- Trimethoprim/-sulfamethoxazole (Bactrim®)

Kennedy CDiff Task Force, 2015



MK.497





Jefferson Health

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JeffersonHealth.org

JEFFERSON | 200

A word cloud on a dark blue background with the word "Discussion" in the largest white font at the center. Other words in various sizes and colors (white, orange, light blue) include: MEETING, Chat, DIALOG, TALK, BUSINESS, Answers, IDEAS, Communicate, SOCIAL, PROPOSAL, IDEAS, Discuss, Connection, Session, Group, INPUT, CONVERSATION, SHARE, OPERATING, QUESTIONS, Dialog, Business, Communication, PARTNERSHIP, Forum, EXPLORATION, Community, Group, Debate, and TALK.

May Office Hours

High Reliability Best Practices for Daily Huddles

May 9, 2024
12:00 PM EST

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