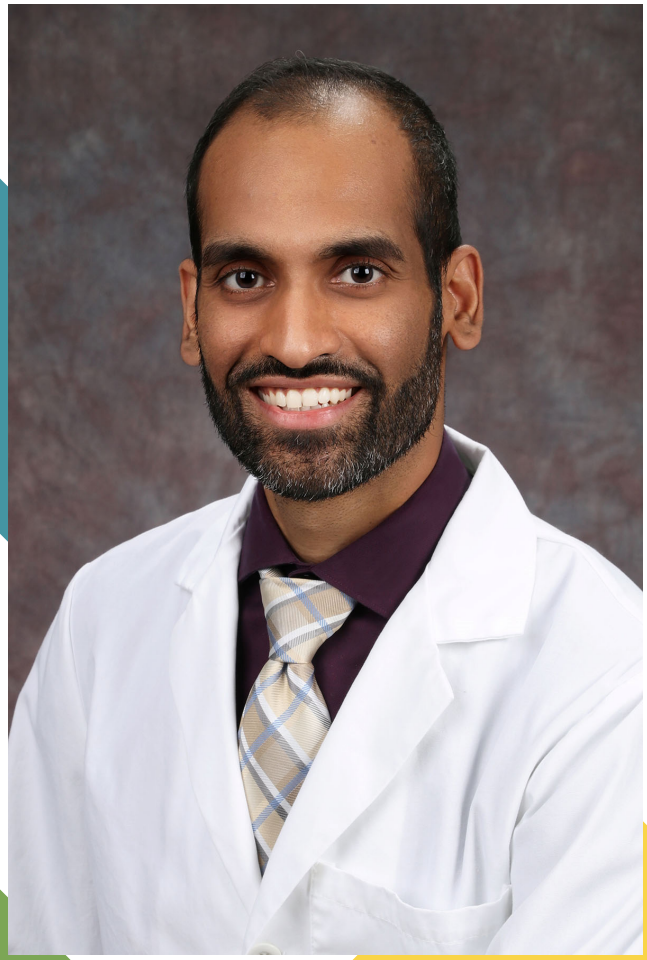

Antimicrobial Stewardship and Nursing

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Learning Objectives

- Understand foundational ideas for successful antimicrobial stewardship efforts
- Describe avenues for nursing teams to contribute to antimicrobial stewardship efforts
- Understand the duration of antibiotic therapy for common infections
- Enlist resources for infection prevention strategies (IDSA updates)
- Explore stewardship and intervention opportunities

Contents

Foundational Ideas for Successful Antimicrobial Stewardship

What, Why, How and Other Thoughts

Foundations:
What is Stewardship? And Why?

1. Strategies and action plans to ensure patients receive the right drug for the right infection/pathogen in the right dose via the most appropriate route of administration.
   a) Right patient
   b) Right medication
   c) Right dose
   d) Right time
   e) Right route
   f) Right time (and the right amount of time)
   g) Right indication
   h) Right bug
   i) Right site of action

2. Doing the right thing for the current patient and future patients

Why Stewardship?

1. Patient Safety
    a. Adverse effects of drugs
    b. Potential for other infections such as CDI
    c. Complications from IV route not changed to PO
2. Antimicrobial Resistance
    a. Drug-bug mismatch
    b. Inappropriate duration of therapy
    c. Avoidable therapy
3. Cost Management
    a. Drug costs (especially for antimicrobial-resistant organisms)
    b. Costs due to avoidable length-of-stay
    c. Cost to patients

Foundations:
How Do We Go About It?

Some typical interventions [1,2]:

- ✓ Selecting appropriate empiric regimen (facility-specific guidelines)
- ✓ De-escalation or escalation of therapy
- ✓ Changing duration of therapy or discontinuing therapy
- ✓ Switch to an alternate agent that is more appropriate for the site of infection and the infecting pathogen
- ✓ Switch to an alternate agent due to local resistance patterns of a strain
- ✓ Switch to an alternate agent due to failed therapy from another agent
- ✓ Switch to an alternate agent due to toxicity from existing agent
- ✓ IV to PO conversions
- ✓ Dose and/or frequency changes due to kidney/liver function changes

Foundations:
Other Considerations; Mindset

1. The typical song – we are usually an accompanying instrument than the lead singer
   - ✓ Corollary – be ready for the solo act when requested
2. Not always a de-escalation and discontinuation machine. Sometimes escalation is the right intervention for the patient.
3. Caution with PI metrics – do not chase interventions to simply drive your numerator
4. Odds of long term success are better with high quality, accurate intervention requests.
5. Messaging is important, because it will create perceptions

Traditional Institutional Stewardship Setup

1. Physician and/or pharmacist champions
2. Front-end or back-end stewardship [3]
3. Heavily reliant on what the patient appears on paper/EMR
4. Committee includes Infection Prevention and Control
5. Lacks action plans for nurses to assist with stewardship

Unique Place of Nurses in the Stewardship Workflow

1. Vital bridge between caregivers and patients and their families
2. Have (or can get) an abundance of knowledge about their patients
3. Already a part of the infectious disease state workflow [1]:
    a. Obtaining cultures
    b. Performing allergy reconciliation
    c. Administering the appropriate dose at the appropriate time via the appropriate route
    d. Communicating with pharmacists and providers on their patient's clinical status or adverse effects

Recap

Some typical interventions:

a. Selecting appropriate empiric regimen (facility-specific guidelines)
b. De-escalation or escalation of therapy
c. Changing duration of therapy or discontinuing therapy
d. Switch to an alternate agent that is more appropriate for the site of infection and the infecting pathogen
e. Switch to an alternate agent due to local resistance patterns of a strain
f. Switch to an alternate agent due to failed therapy from another agent
g. Switch to an alternate agent due to toxicity or adverse effects from existing agent
h. IV to PO conversions
i. Dose and/or frequency changes due to kidney/liver function changes

*** Additionally, infection prevention strategies are central to successful stewardship efforts**

Overview of Nursing-assisted Stewardship

- ✓ Obtaining cultures
- ✓ Performing allergy reconciliation
- ✓ Administering the appropriate dose at the appropriate time via the appropriate route
- ✓ Communicating with pharmacists and providers on their patient's clinical status or adverse effects
- ✓ De-escalation or escalation of therapy
- ✓ Switch to an alternate agent due to toxicity or adverse effects from existing agent
- ✓ IV to PO conversions
- ✓ Dose and/or frequency changes due to kidney/liver function changes

Durations of Therapy for Common Infections in Adults [4,5,6]

Infection	Typical Treatment Duration	Notes
UTI (Cystitis)	3 to 7 days	Duration varies based on patient gender, severity of illness, or class of antibiotic used
UTI (Pyelonephritis)	5 to 14 days	
Community Acquired Pneumonia	5 to 7 days	Duration depends on type of bacteria as well as patient's clinical progression
Hospital-acquired or Ventilator-associated Pneumonia	7 days	Duration could change based on bacterial isolate or clinical progression
Intra-abdominal infections	<7 days	Duration could be longer based on clinical progression

Durations of Therapy for Common Infections in Adults [4,5,6,7]

Infection	Typical Treatment Duration	Notes
Acute Exacerbation of Chronic Bronchitis	5 days	Treatment with antibiotics usually recommended only if bacterial etiology suspected
Vertebral Osteomyelitis	6 weeks	Duration could be longer based on clinical progression
Staphylococcus aureus Bacteremia	14 days from first negative blood culture	Duration can be longer based on clinical progression
Gram Negative Bacteremia	Minimum 7 days	Duration can be longer based on clinical progression
Antimicrobial-resistant Gram-negative Infections [7]	Varies	**

Infection Prevention Strategies [8,9]

- VAP (May 2022)
- CLABSI (Apr 2022)
- Hand Hygiene (Feb 2023)
- CDI (Apr 2023)
- Surgical Site Infection (May 2023)
- MRSA (Jun 2023)
- CAUTI (Aug 2023)
- MDROs (CDC)

Category	Rationale	Intervention	Quality of Evidence
Essential practices	Good evidence that the intervention decreases the average duration of mechanical ventilation, length of stay, mortality, and /or costs. Benefits likely outweigh risks.	Avoid intubation and prevent reintubation • Use high-flow nasal oxygen or noninvasive positive pressure ventilation (NIPPV) as appropriate whenever safe and feasible[91–93,96,99]	HIGH
		Minimize sedation[105,106] • Avoid benzodiazepines in favor of other agents[106] • Use a protocol to minimize sedation[110] • Implement a ventilator liberation protocol[113]	MODERATE
		Maintain and improve physical conditioning[113,120–123]	MODERATE
		Elevate the head of the bed to 30–45°[125,388–390]	LOW[a]
		Provide oral care with toothbrushing but *without* chlorhexidine[126,127]	MODERATE
		Provide early enteral vs. parenteral nutrition[131]	HIGH
		Change the ventilator circuit only if visibly soiled or malfunctioning (or per manufacturers' instructions)[391–394]	HIGH
Additional approaches	Good evidence that the intervention improves outcomes in some populations, but may confer some risk in others.	Use selective oral or digestive decontamination in countries and ICUs with low prevalence of antibiotic-resistant organisms[128,134,135]	HIGH[a]
	May lower VAP rates but insufficient data to determine impact on duration of mechanical ventilation, length of stay, or mortality.	Utilize endotracheal tubes with subglottic secretion drainage ports for patients expected to require >48–72 hours of mechanical ventilation[395]	MODERATE
		Consider early tracheostomy[144]	MODERATE
		Consider postpyloric rather than gastric feeding for patients with gastric intolerance or at high risk for aspiration[131,147]	MODERATE
Generally not recommended	Inconsistently associated with lower VAP rates and no impact or negative impact on duration of mechanical ventilation, length of stay, or mortality.	Oral care with chlorhexidine[75,128–130,150]	MODERATE
		Probiotics[153–156]	MODERATE
		Ultrathin polyurethane endotracheal tube cuffs[165–167]	MODERATE
		Tapered endotracheal tube cuffs[169]	MODERATE
		Automated control of endotracheal tube cuff pressure[170,171,174,175]	MODERATE
		Frequent cuff-pressure monitoring[176]	MODERATE
		Silver-coated endotracheal tubes[178]	MODERATE
		Kinetic beds[180]	MODERATE
		Prone positioning[181,183,a]	MODERATE
		Chlorhexidine bathing[184–186,a]	MODERATE
	No impact on VAP rates, average duration of mechanical ventilation, length of stay, or mortality.[a]	Stress-ulcer prophylaxis[190,191,193]	MODERATE
		Monitoring residual gastric volumes[194]	MODERATE
		Early parenteral nutrition[195]	MODERATE
No recommendation	No impact on VAP rates or other patient outcomes, unclear impact on costs.	Closed endotracheal suctioning systems[197–199]	MODERATE

Tactics and Opportunities Within Your Current Setting

- ✓ Medication Rounds
  - Missed MAR Charting
  - Under or overdose?
  - Snapped (docked) bags not activated?
  - IV pumps not being used
  - IV pump entry incorrect?
  - Vancomycin troughs not drawn prior to the next dose being administered?
- ✓ Communicating dose schedules (floor to OR/PACU)
- ✓ Acting as Intermediaries of Information
- ✓ Acting as “Triggers” of Conversations (with AMS team members)
- ✓ Self-education of bacteria, drugs, infection prevention strategies, treatment options and interpreting susceptibility results

Tactics and Opportunities Within Your Current Setting

- ✓ Obtaining cultures
- ✓ Performing allergy reconciliation
- ✓ Administering the appropriate dose at the appropriate time via the appropriate route
- ✓ Communicating with pharmacists and providers on their patient's clinical status or adverse effects
- ✓ De-escalation or escalation of therapy
- ✓ Switch to an alternate agent due to toxicity or adverse effects from existing agent
- ✓ IV to PO conversions
- ✓ Dose and/or frequency changes due to kidney/liver function changes

1. Redefining the Antibiotic Stewardship Team (ANA and CDC; 2017)[1] https://www.cdc.gov/antibiotic-use/healthcare/pdfs/ana-cdc-whitepaper.pdf

Tactics and Opportunities Within Your Current Setting

Final Thoughts

- Nursing assistance is the next frontier in stewardship
- Ample opportunities for interventions
- Recent literature shows similar or better outcomes with shorter-term antimicrobial therapy than longer-term therapy in many infections
- Infection prevention strategies go hand-in-hand with stewardship efforts

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Thank you

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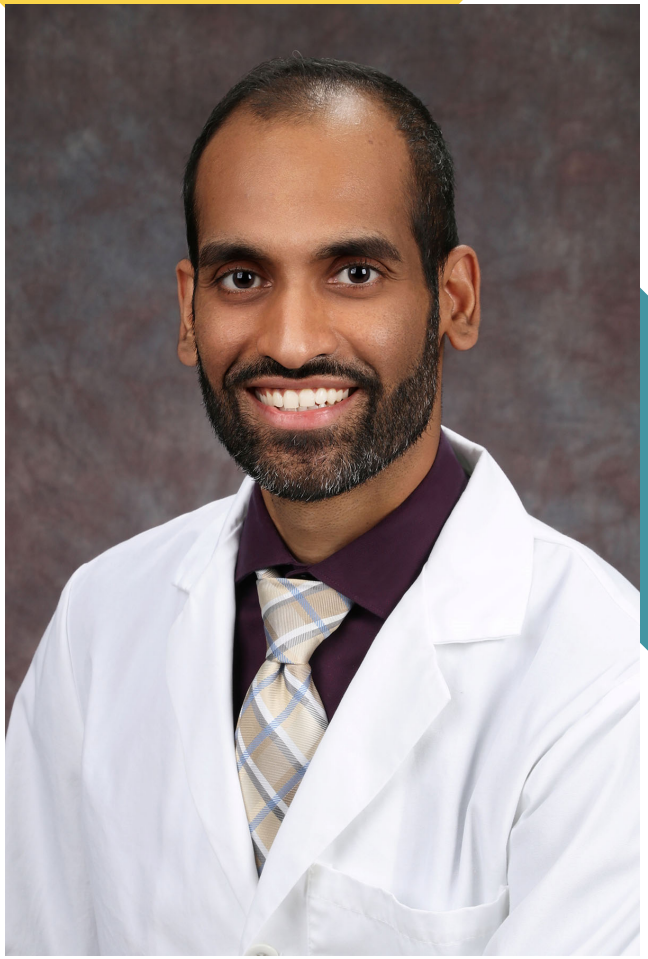

Questions?