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Implementing Antimicrobial Stewardship in Community Hospital and Resource-Limited Settings

One Health Conference 2024

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Speaker Disclosure

- I have no relevant financial relationships to disclose

Learning Objectives

- Discuss the challenges of developing an antimicrobial stewardship program (ASP) in the community hospital setting

- Identify key interventions that can provide an appropriate level of stewardship in the resource-limited setting

- Determine approach to optimize resource utilization for a sustainable and successful ASP

Audience Poll

- How large is the hospital you represent?
  - < 25 beds (critical access)
  - 25-100 beds
  - 100-300 beds
  - > 300 beds
  - Not from the hospital setting

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Audience Poll

- How long has the antimicrobial stewardship program at your hospital been in place?
  - 1-2 years
  - 3-5 years
  - 6-10 years
  - > 10 years
  - Not started yet but working on it

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About Northwestern Medicine - Northwest Region

Northwestern Medicine Huntley Hospital

- Huntley Hospital
  - 128 bed level II trauma center with 12 ICU beds
  - Med/surg, OB, pediatrics, hip/knee replacement, bariatrics, oncology

- McHenry Hospital
  - 143 bed level II trauma center with 27 ICU beds
  - Med/surg, cardiovascular interventions, surgical services, oncology

- Woodstock Hospital
  - 24/7 ER
  - Inpatient behavioral health
  - 22 bed inpatient rehab

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Beginning of our Antimicrobial Stewardship Program

- Our 3 hospitals, previously Centegra Health System had no formal Antimicrobial Stewardship Program (ASP) until 2017
  - CMO, an ID physician, appointed as ASP physician lead
  - Statement of leadership commitment to ASP signed
  - 2 ID & stewardship-trained pharmacists hired

- Pharmacist co-leads tasked with building the ASP from ground up

Potential Challenges in Community Hospital Setting

Lack of ID/stewardship expertise

Limited diagnostic & laboratory capacity

Gaps in antibiotic use data or antibiotic resistance patterns

Weak data management systems

Inexperience with data analysis and program implementation

Lack of appropriate policies and guidelines

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Potential Challenges in Community Hospital Setting

Our challenges

Lack of ID/stewardship expertise	Limited diagnostic & laboratory capacity
Gaps in antibiotic use data or antibiotic resistance patterns	Weak data management systems
Inexperience with data analysis and program implementation	Lack of appropriate policies and guidelines

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First Steps to Develop an ASP

- Establish framework

- Identify gaps

- Prioritize needs

First Steps to Develop an ASP

- **Establish framework**

- Identify gaps

- Prioritize needs

Core Elements of Hospital Antibiotic Stewardship Programs

Hospital Leadership Commitment
Dedicate necessary human, financial, and information technology resources.

Accountability
Appoint a leader or co-leaders, such as a physician and pharmacist, responsible for program management and outcomes.

Pharmacy Expertise (previously "Drug Expertise"):
Appoint a pharmacist, ideally as the co-leader of the stewardship program, to help lead implementation efforts to improve antibiotic use.

Action
Implement interventions, such as prospective audit and feedback or preauthorization, to improve antibiotic use.

Tracking
Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.

Reporting
Regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, and hospital leadership.

Education
Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.

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First Steps to Develop an ASP

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- **Identify gaps**

- Prioritize needs

Core Elements of Hospital Antibiotic Stewardship Programs:
Assessment Tool

The antibiotic stewardship program assessment tool is a companion to *Core Elements of Hospital Antibiotic Stewardship Programs*. This tool provides examples of ways to implement the Core Elements. The Core Elements are intended to be an adaptable framework that hospitals can use to guide efforts to optimize antibiotic prescribing. Thus, not all of the examples listed in the Core Elements (and below) may be necessary and/or feasible in all hospitals.

The assessment tool can be used on a periodic basis (e.g., annually) to document current program infrastructure and activities and to help identify items that could improve the effectiveness of the stewardship program. Consider listing specific details, such as points of contacts or facility-specific guidelines with the date, in the "comments" column as reference for the antibiotic stewardship team.

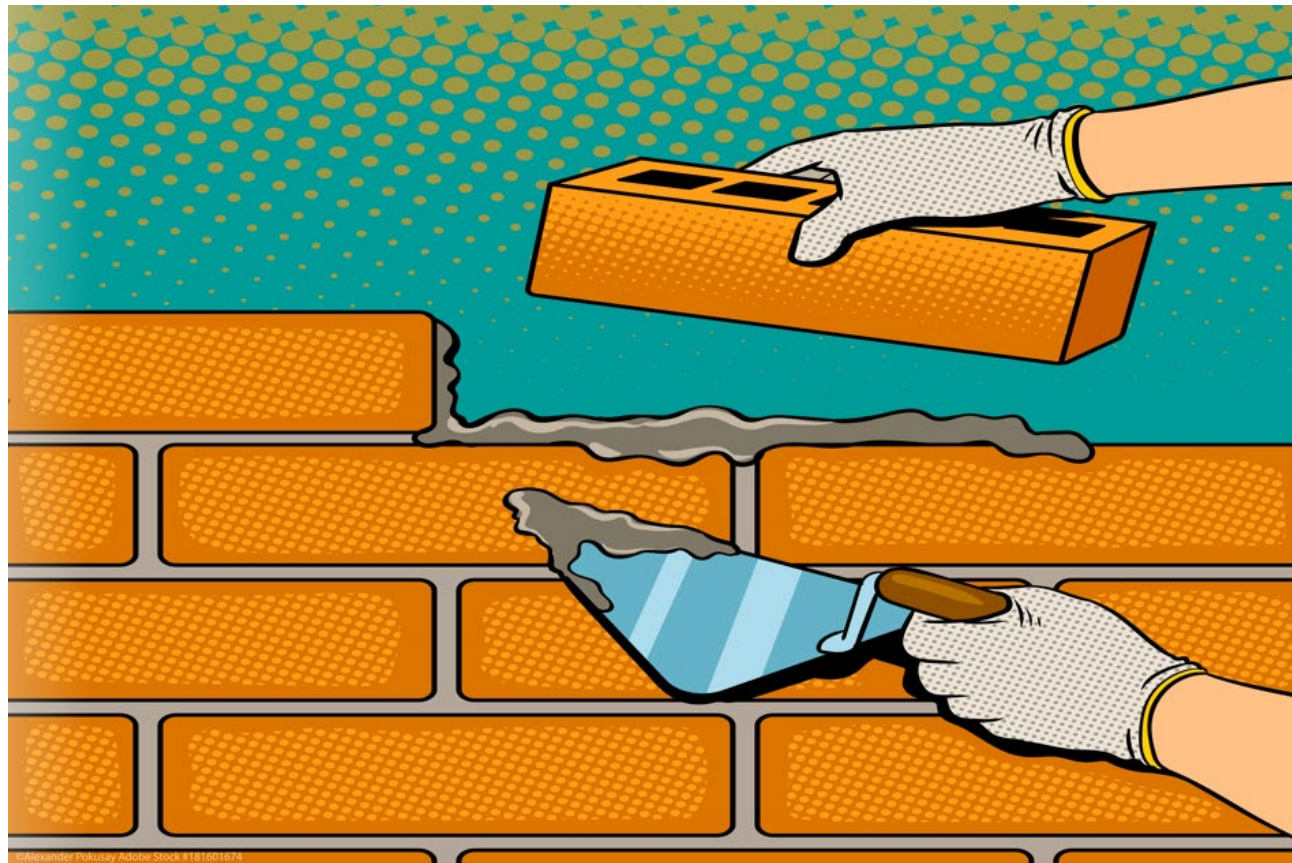| CORE ELEMENTS OF HOSPITAL ANTIBIOTIC STEWARDSHIP PROGRAMS: ASSESSMENT TOOL		ESTABLISHED AT FACILITY	COMMENTS
Hospital Leadership Commitment	1. [Priority Example] Does facility leadership provide stewardship program leader(s) dedicated time to manage the program and conduct daily stewardship interventions?	☐ Yes ☐ No	
	2. [Priority Example] Does facility leadership provide stewardship program leader(s) with resources (e.g, IT support, training) to effectively operate the program?	☐ Yes ☐ No	
	3. [Priority Example] Does your antibiotic stewardship program have a senior executive that serves as a point of contact or "champion" to help ensure the program has resources and support to accomplish its mission?	☐ Yes ☐ No	
	4. [Priority Example] Do stewardship program leader(s) have regularly scheduled meetings with facility leadership and/or the hospital board to report and discuss stewardship activities, resources and outcomes?	☐ Yes ☐ No	

First Steps to Develop an ASP

- Establish framework

- Identify gaps

- **Prioritize needs**
  - The Joint Commission's 12 elements of performance (EP's) *required* for ASP
    - Resource Allocation
    - Organizational Support
    - Program Leadership
    - Multidisciplinary Committee
    - Program Coordination
    - Documentation
    - Monitor Antibiotic Use
    - Optimize Prescribing
    - Implement Evidence-Based Guidelines
    - Adherence to Evidence-Based Guidelines
    - Data Collection and Reporting
    - Performance Improvement

How to Prioritize Needs

- ~~Difficult~~ Impossible to tackle all 12 EP's by the Joint Commission at one time

- Identify 2-3 priorities given current resources, even if limited in scope

- Plan on a more complete implementation of all EP's in the future

Laying the Foundation for ASP

Laying the Foundation for ASP

- 1) Single point of contact with responsibility for the program

Pharmacy Expertise (previously "Drug Expertise"):
Appoint a pharmacist, ideally as the co-leader of the stewardship program, to help lead implementation efforts to improve antibiotic use.

- If ID/stewardship-trained pharmacist not available, consider others such as a hospitalist, infection control nurse, or clinical microbiologist

- 2) Support from hospital leadership

Hospital Leadership Commitment
Dedicate necessary human, financial, and information technology resources.

- Hospital administration buy-in critical to support ASP activities

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Who to Designate as ASP Lead

- ID/stewardship-trained pharmacist

    or

- ID-trained physician

    or

- Pharmacist without ID-training

    or

- Physician without ID-training

Courses and certifications in antimicrobial stewardship exist to help build knowledge base

Courses and Certifications for Antimicrobial Stewardship

Table 3
Courses and certifications for antimicrobial stewardship

Organization	Link
CDC	https://www.cdc.gov/antibiotic-use/community/for-hcp/continuing-education.html
AHRQ Nursing Home Antimicrobial Stewardship Guide	https://www.ahrq.gov/nhguide/index.html
APIC trainings and resources	https://apic.org/Resources/Topic-specific-infection-prevention/Antimicrobial-stewardship/
Stanford University	https://med.stanford.edu/cme/learning-opportunities/antimicrobialstewardship.html
Making a Difference Infectious Diseases Online $	http://www.mad-id.org
Society of Infectious Diseases Pharmacists $	http://bit.ly/2avkxe0
SHEA $	http://www.stewardship-education.org/education/

$ denotes cost.
Abbreviations: AHRQ, Agency for Healthcare Research and Quality; APIC, Association for Professionals in Infection Control and Epidemiology; SHEA, Society for Healthcare Epidemiology of America.

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Laying the Foundation for ASP

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Hospital Leadership Commitment
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Support from Hospital Leadership

- Obtain a statement of leadership commitment for antibiotic stewardship

- Include stewardship-related duties in job descriptions

- Ensure staff from relevant departments are given sufficient time to contribute to stewardship activities

Next Steps
Where do we begin?

- It depends on the available resources

- Some considerations:

| If you have clinical pharmacists but *no* dedicated stewardship pharmacist	Antibiotic renal dose adjustments
	IV to PO antibiotic conversions
If your facility has access to timely and accurate microbiology results	Cumulative antibiograms
If you have an antimicrobial stewardship team with dedicated time to review patient cases	Prior authorization of restricted drugs
	Prospective audit & feedback
	De-labeling of antibiotic allergies
	Antibiotic duration review

Low Hanging Fruit for Resource-limited Settings

- Protocols for:
  - IV to PO conversion
    - Azithromycin, clindamycin, ciprofloxacin, doxycycline, levofloxacin, linezolid, metronidazole, rifampin, TMP/SMX
  - Antibiotic renal dose adjustments
  - Antibiotic dose rounding
  - Vancomycin dosing
    - Includes evaluating for appropriate indication
  - Aminoglycoside dosing
    - Includes evaluating for appropriate indication

Low Hanging Fruit for Resource-limited Settings

- Stewardship can be done by clinical staff pharmacists

- Optimized with clinical decision support system (CDSS), if available
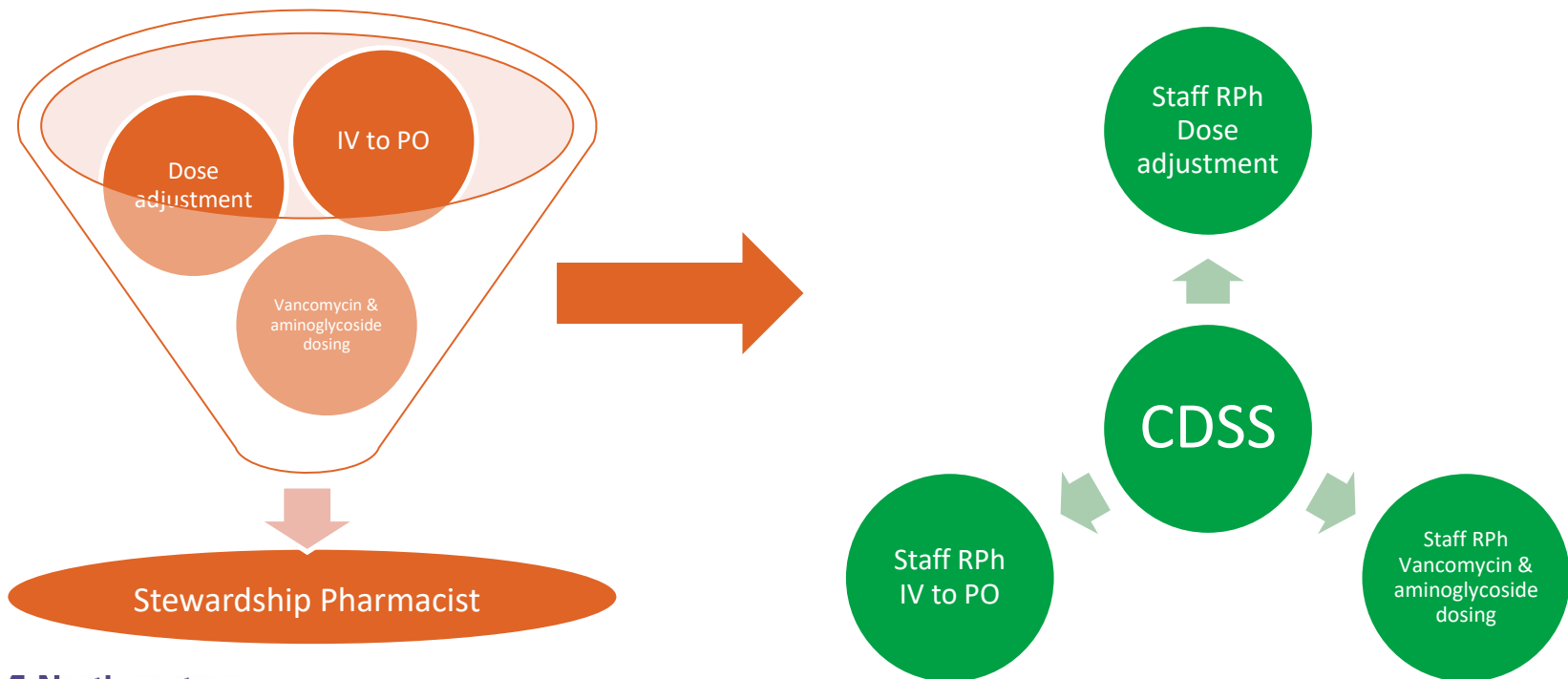
Stepwise Approach to Building ASP

After ASP foundation is established

Form antimicrobial stewardship committee

Members should include relevant hospital stakeholders

↓

Start with single priority area for the ASP

Focus on one initiative first instead of attempting to introduce many changes simultaneously

↓

Ensure appropriate policies or guidelines are in place

Use national or local guidance and adapt for facility as appropriate

↓

Educate staff and publicize stewardship campaign

In-services, grand rounds, new hire competencies, etc.

↓

Implement stewardship activities targeted at the priority

Our ASP's First Focus

Start with single priority area for the ASP

- Revamped antibiotic formulary and established a 3-tier system:
  - Tier 1 antibiotics: not restricted
  - Tier 2 antibiotics: ASP pharmacist approval required
  - Tier 3 antibiotics: ID consult required

Ampicillin/sulbactam
Aztreonam
Cefepime
Ciprofloxacin
Ertapenem
Levofloxacin

Ensure appropriate policies or guidelines are in place

- Approved Antimicrobials Restriction Policy at ASP committee and P&T meetings

Educate staff and publicize stewardship campaign

- Conducted pharmacy and nursing education and posted flyers for medical staff

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Initial Problems We Encountered

- EHR with very limited clinical decision support features
  - Not able to implement a hard stop for ID-restricted or ASP pharmacist approval-required antibiotics
    - Conducted prospective audit & feedback on tier 2 antibiotics
  - Unable to run reports to find patients on restricted antimicrobials
    - Also no ability to run reports on antibiotic use

- Identifying patients and chart reviews time-intensive
  - 10-15 patients at each hospital on tier 2 antibiotics

- Recommendation acceptance rate low
  - Providers unfamiliar with restriction criteria
    - Providers not aware of ASP pharmacist's role
  - Limited collaboration with ID physicians

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The Quality Triangle

- Visual representation of scope, time, and cost constraints based on project management principles

- Scope is directly proportional to both time and cost
  - When scope increases, time and money must also increase in order to maintain quality of larger project
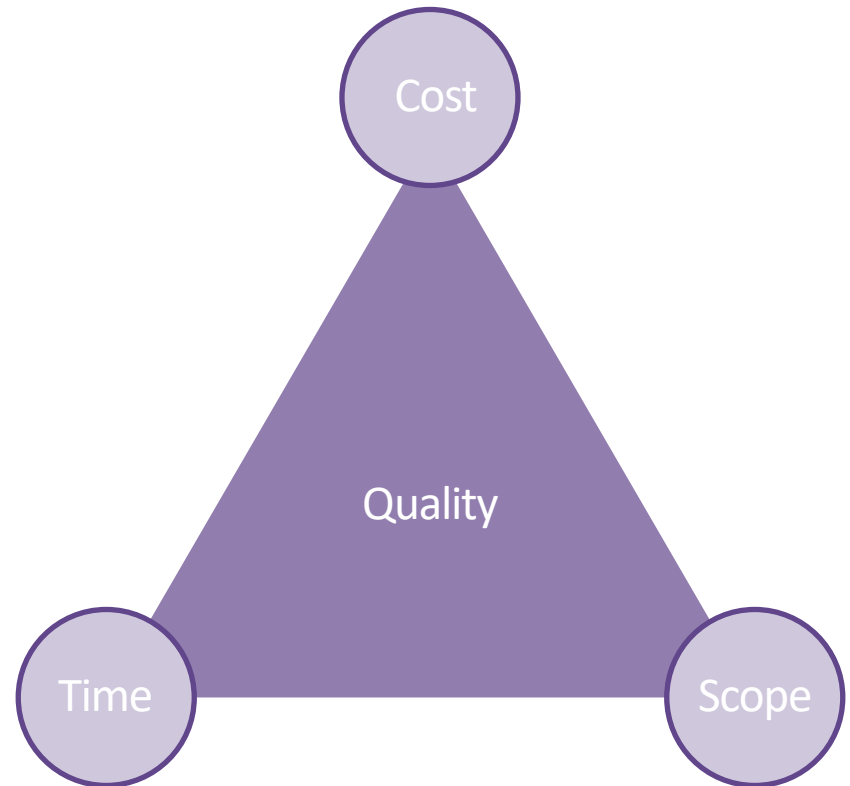
Identifying A Solution

- EHR with very limited clinical decision support features
  - Need $$ for CDSS or IT support
  - ➢ Not able to change

- Identifying patients and chart reviews time-intensive
  - Limited to 2 ASP pharmacists reviewing
 - ➢ Not able to change
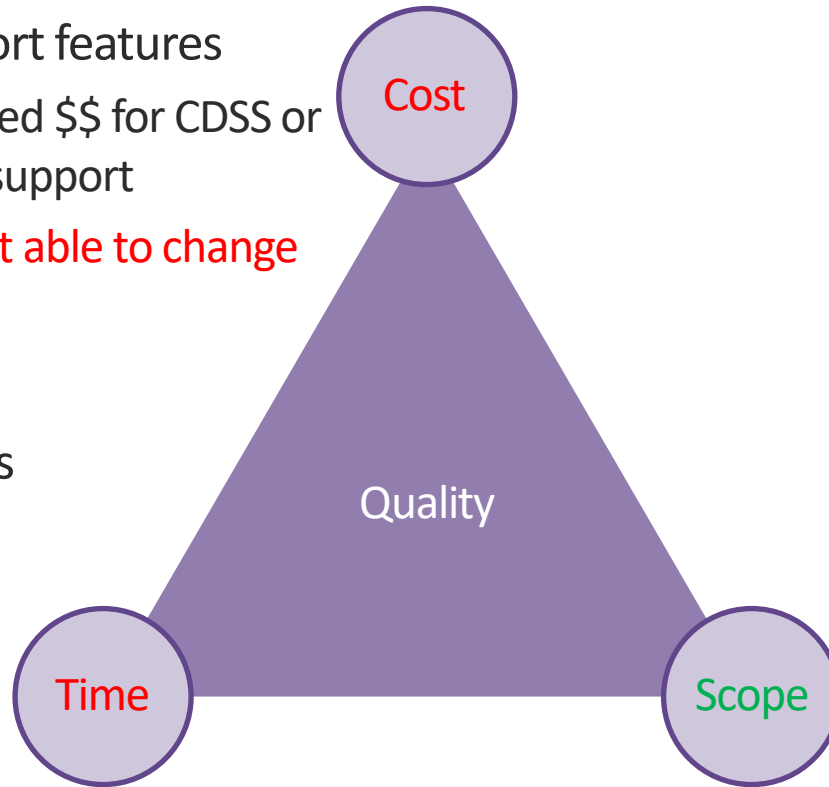
- All tier 2 antibiotics required ASP pharmacist approval
  - Could target a single antibiotic: the one most commonly prescribed inappropriately
  - ➢ Able to change: reduce scope

Cost

Quality

Time

Scope

Refocusing and Reducing Scope

- Reviewed manually collected data on tier 2 antibiotic use
  - Recognized ertapenem as most common, inappropriately prescribed antibiotic
  - Conducted MUE on ertapenem
- Action: Change ertapenem to an ID-restricted, tier 3 antimicrobial

Ertapenem Use
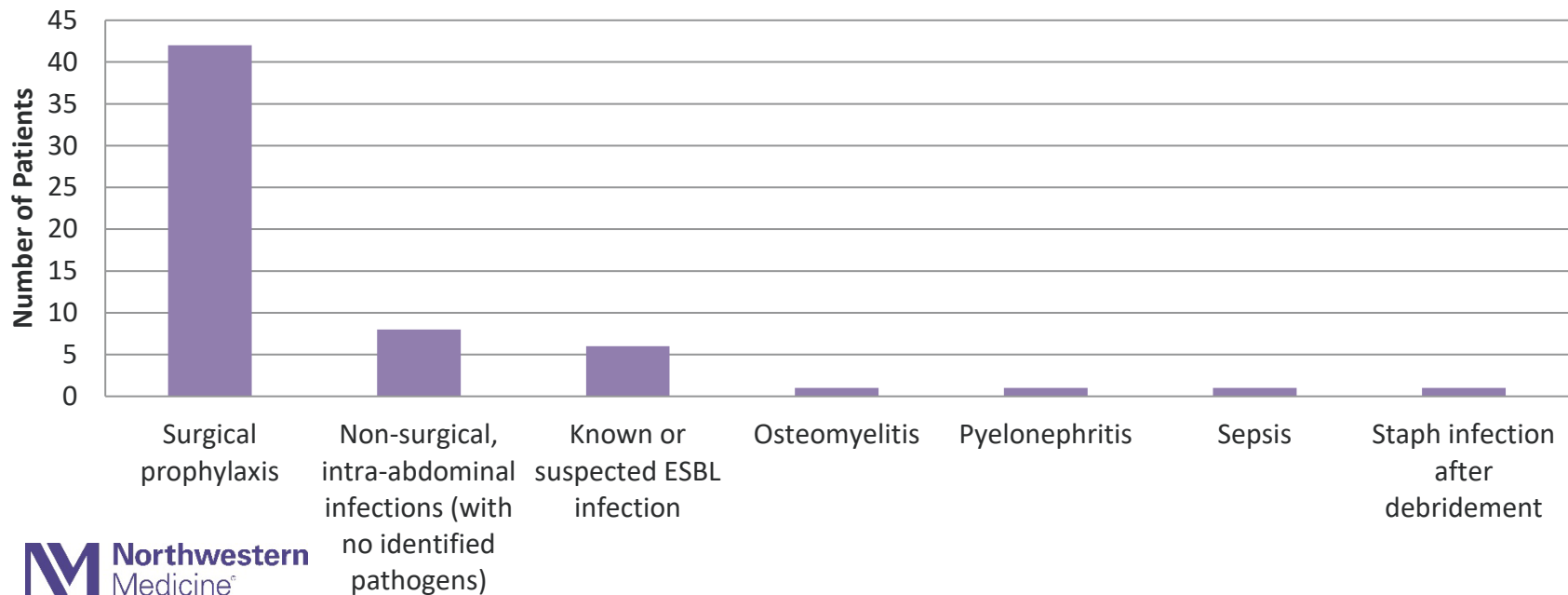
Stepwise Approach

Start with single priority area for the ASP

- Restrict ertapenem to ID-consult only, tier 3 antibiotic

Ensure appropriate policies or guidelines are in place

- Updated Antimicrobials Restriction Policy and received approval at P&T

Educate staff and publicize stewardship campaign

- Conducted pharmacy and nursing education
- SBAR memo sent to medical staff
  - Included ertapenem alternatives for surgical prophylaxis and in pediatric patients
- Posted flyers

Results of Ertapenem Restriction Initiative
Started in November 2018

- Manually counted and calculated ertapenem DOT/1000 pt days in ICU's
  - Unable to generate reports from EHR
- Showed sustained decrease in ertapenem use at both hospitals

Ertapenem Use (DOT/1000 pt days) in ICU's
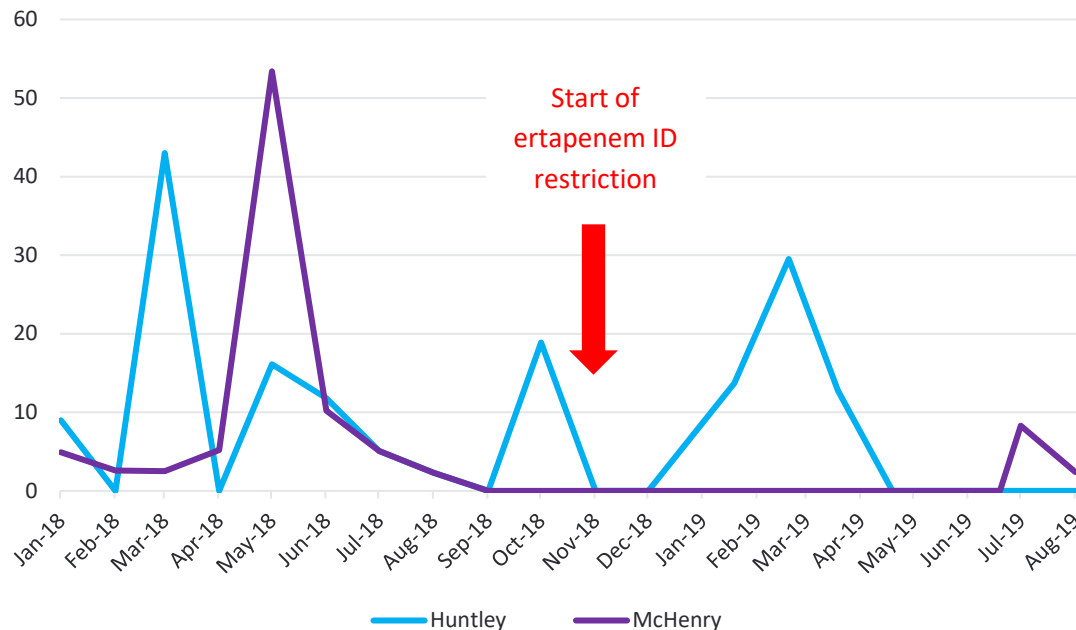
Stepwise Approach to Building ASP

- Once priority initiative established and in maintenance phase, go back to the stepwise approach
  - Find a new target
  - "Rinse and repeat"
- Regularly review/revise the approach as issues arise

Determine Target

Implement

Maintain
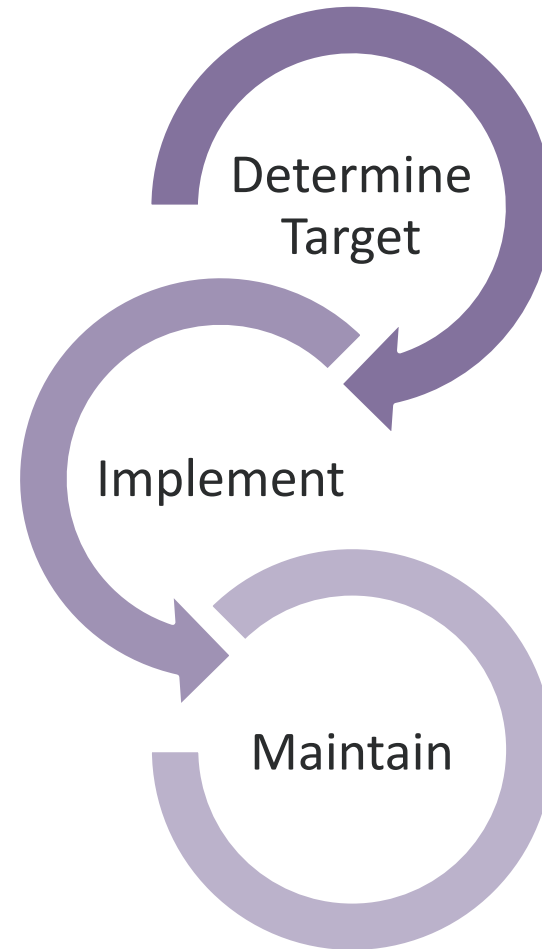
Summary

- Resource-limited community hospitals face a variety of challenges to establishing a robust ASP

- Start with a stepwise approach and choose 2 - 3 activities targeted at a priority area

- Executing fewer activities well is preferable to implementing more activities poorly
  - Consider complexity and available resources to set realistic goals

- No "one size fits all" approach to optimize antibiotic use

Thank You

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