ANTIBIOTIC STEWARDSHIP IN THE EMERGENCY DEPARTMENT

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Objectives

- Define antimicrobial stewardship and list its benefits
- Identify the importance of antibiotic stewardship within the ED
- Describe methods in which ED pharmacists can be utilized to design, implement and improve ED antibiotic stewardship
- Identify methods in which to implement an ED antibiotic stewardship program

OUTLINE

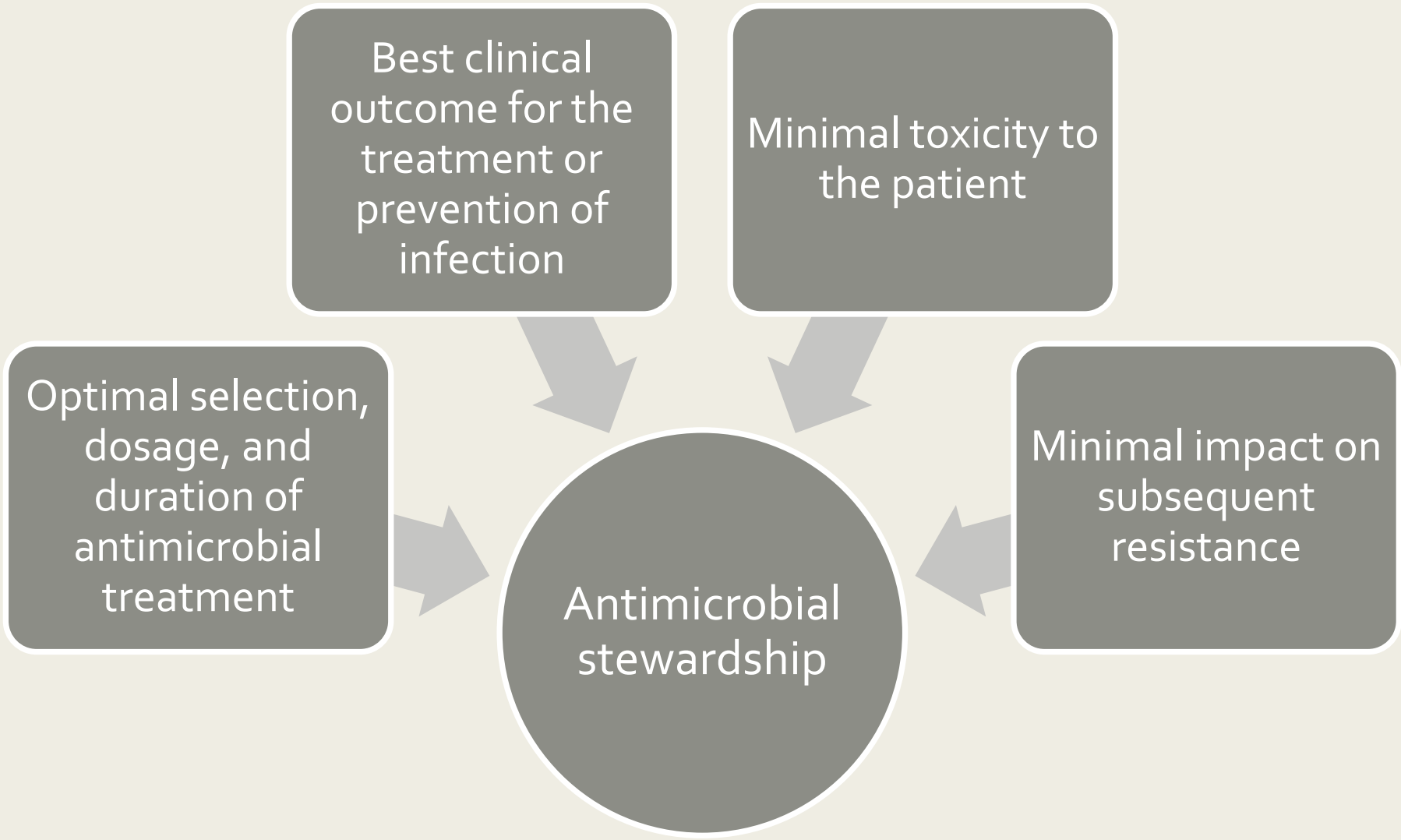
Introduction

ED antimicrobial stewardship examples

ED pharmacist and antimicrobial stewardship

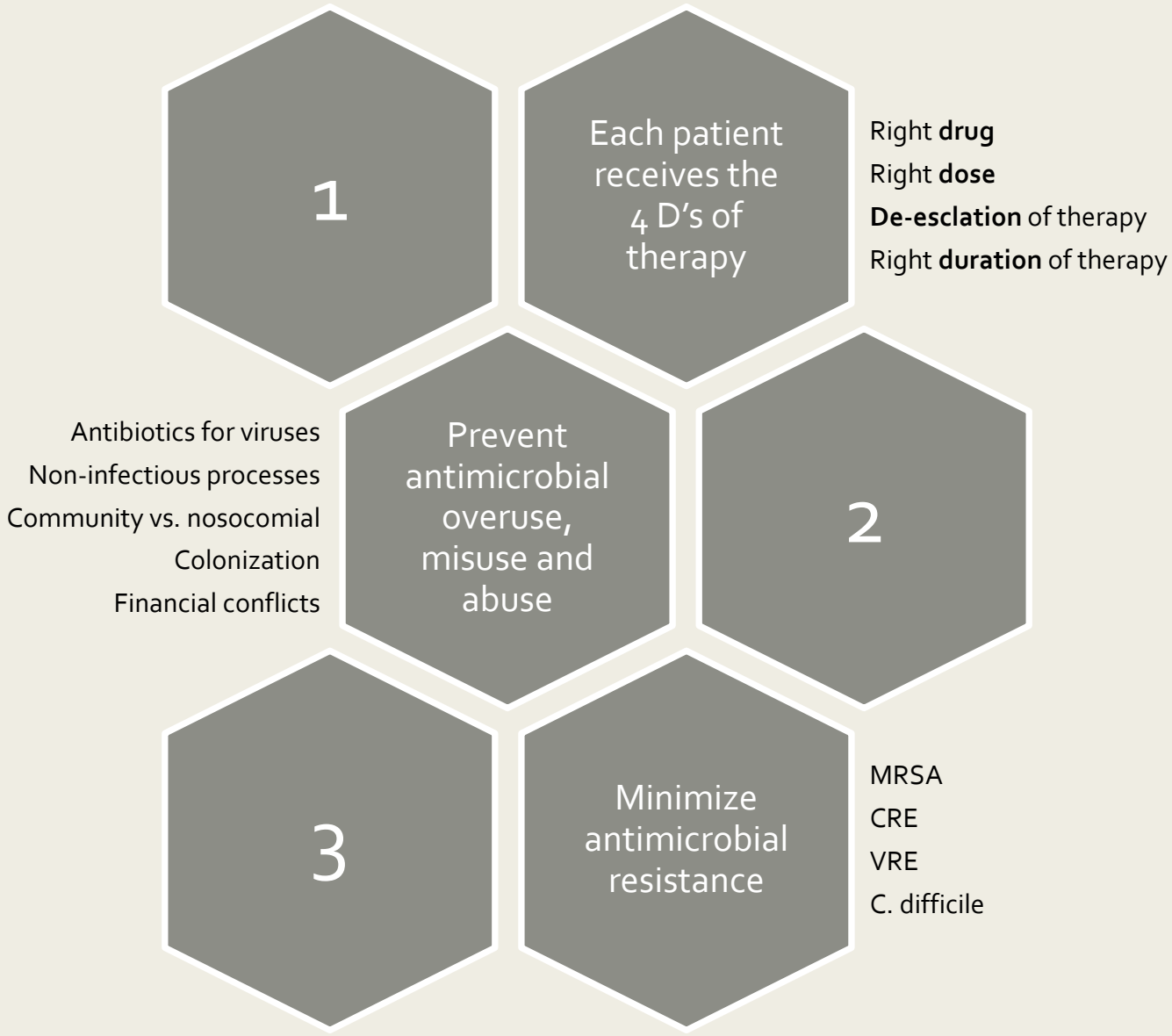
Strategies for implementation

Antimicrobial stewardship defined



Doron S, et al. *Mayo ClinProc.* 2011;86(11):1113-23.

Goals of antimicrobial stewardship



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Benefits of antimicrobial stewardship

- Improved patient outcomes
  - *Decreased morbidity and mortality*
  - *Decreased adverse events*
    - Colonization
    - *C. difficile*
    - Side effects and allergies
- Decreased costs
- Decreased antimicrobial resistance

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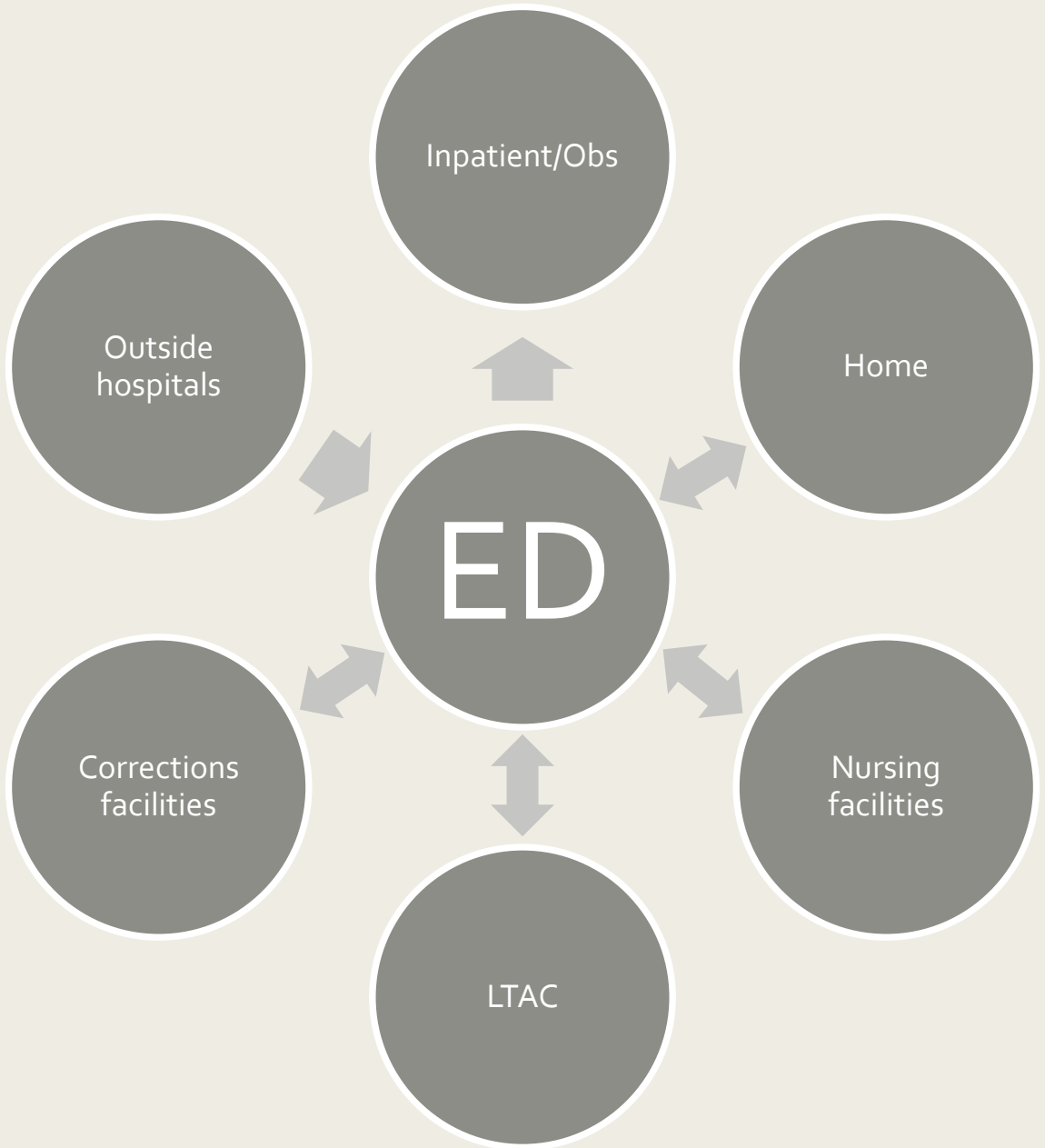
Antimicrobial stewardship in the ED



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Strategies for implementation

- Does the antibiotic reach infection site?
  - *Penetrate BBB*
  - *Inactivation in the body*

- Does the patient need the "big guns"?
  - *Which bacteria need to be covered*

- How long does the patient need to be treated?
  - *UTI – cystitis vs. pyelonephritis*
  - *Source control achieved*

Doron S, et al. *Mayo ClinProc.* 2011;86(11):1113-23.

The truth about antimicrobial allergies

- Broad spectrum antibiotics utilized more often in patients with reported penicillin allergies
  - *Higher costs*
  - *Increased risk resistance*
  - *Suboptimal therapy*
- **< 1 %** of patients have a **true** penicillin allergy
- In a patient with a penicillin allergy, the risk of a type 1 IgE-mediated allergic reaction to cephalosporins and carbapenems is **< 1 %**
- **Over 90%** of patients with a reported penicillin allergy can actually tolerate a penicillin

How to approach reported antibiotic allergies

- Is it a true allergy (IgE mediated)?
  - *Hives*
  - *Angioedema*
  - *Wheezing or shortness of breath*
  - *Hypotension*
- Is it a side effect?
  - *N/V/D*
  - *Itchiness*
- Get detailed history from patient
  - *Which specific antibiotic?*
  - *What was the reaction?*
  - *When did reaction occur?*
- Avoid antibiotics with similar R side chains

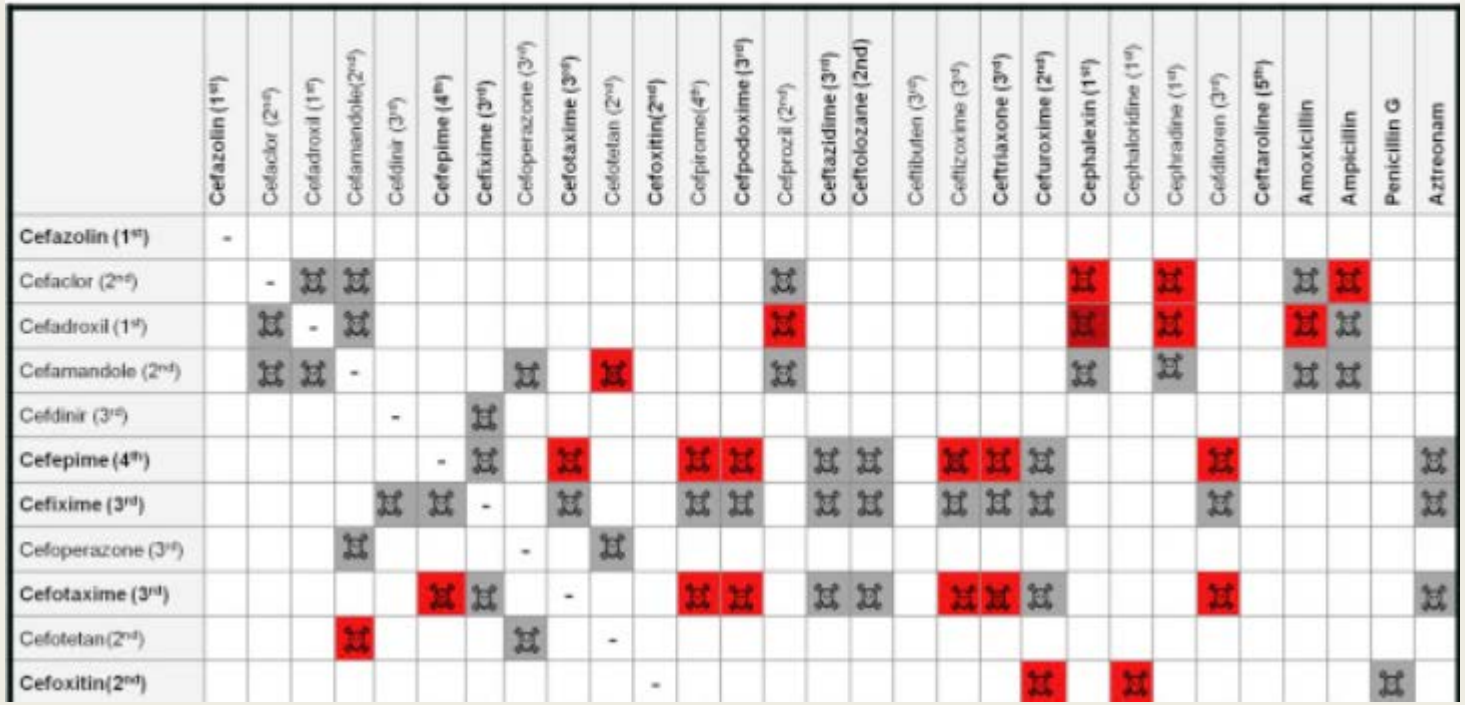
Blumenthal KG, et al. J Allergy Clin Immunol Pract. 2017; 5(3): 616-625.

1

Each patient receives the 4 D's of therapy

Right **drug**
Right **dose**
De-esclation of therapy
Right **duration** of therapy

Cross-Sensitivity Chart



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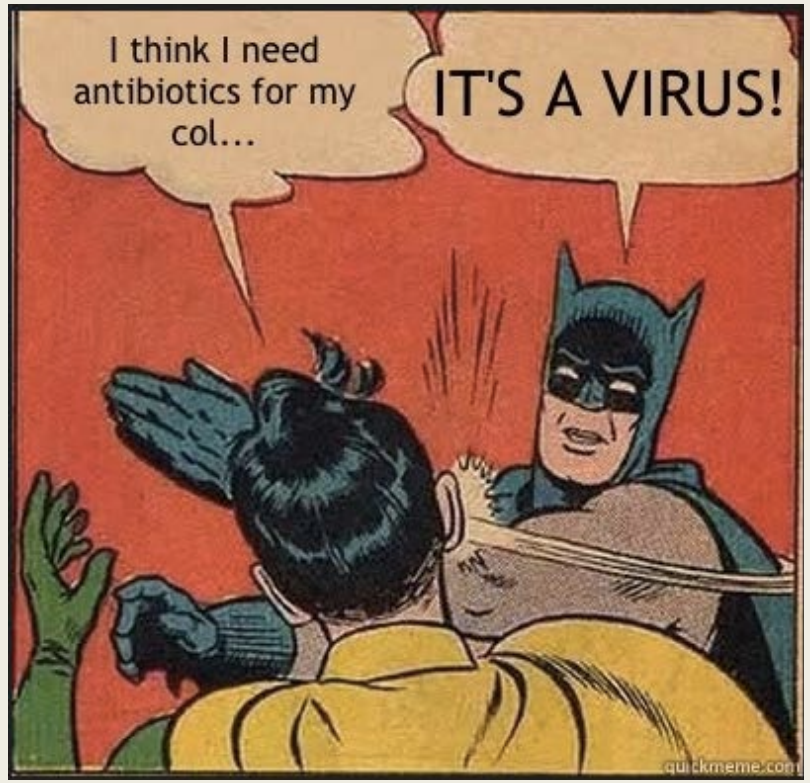
Prevent antimicrobial overuse, misuse and abuse

Antibiotics for viruses
Non-infectious processes
Community vs. nosocomial
Colonization
Financial conflicts

Does the patient need antibiotics?

- Bacterial vs. viral respiratory illness
- Otitis media
- Strep throat
- Green snot
- I&D for abscess



Bennet, N. (2012). *When it really is a virus*. Accessed 3 Dec. 2018.

2

Prevent antimicrobial overuse, misuse and abuse

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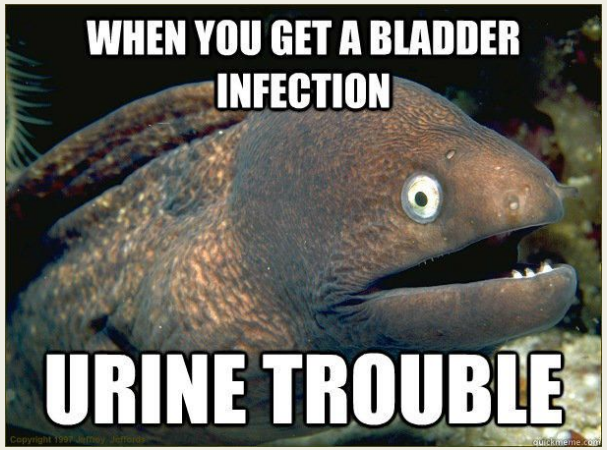
Urinary tract infection

- Acute dysuria alone OR
- Fever + at least **one** of the below OR
- At **least two** symptoms:
  - *Gross hematuria*
  - *Incontinence*
  - *Urgency*
  - *Suprapubic pain*
  - *CVA tenderness*
  - *Frequency*

NOT a urinary tract infection

- Foul smelling urine
- Cloudy urine
- Falls or gait instability
- Functional decline
- Acute mental status change **alone**



Nicolle LE, et al. Clin Infect Dis. 2005; 40: 643-54.

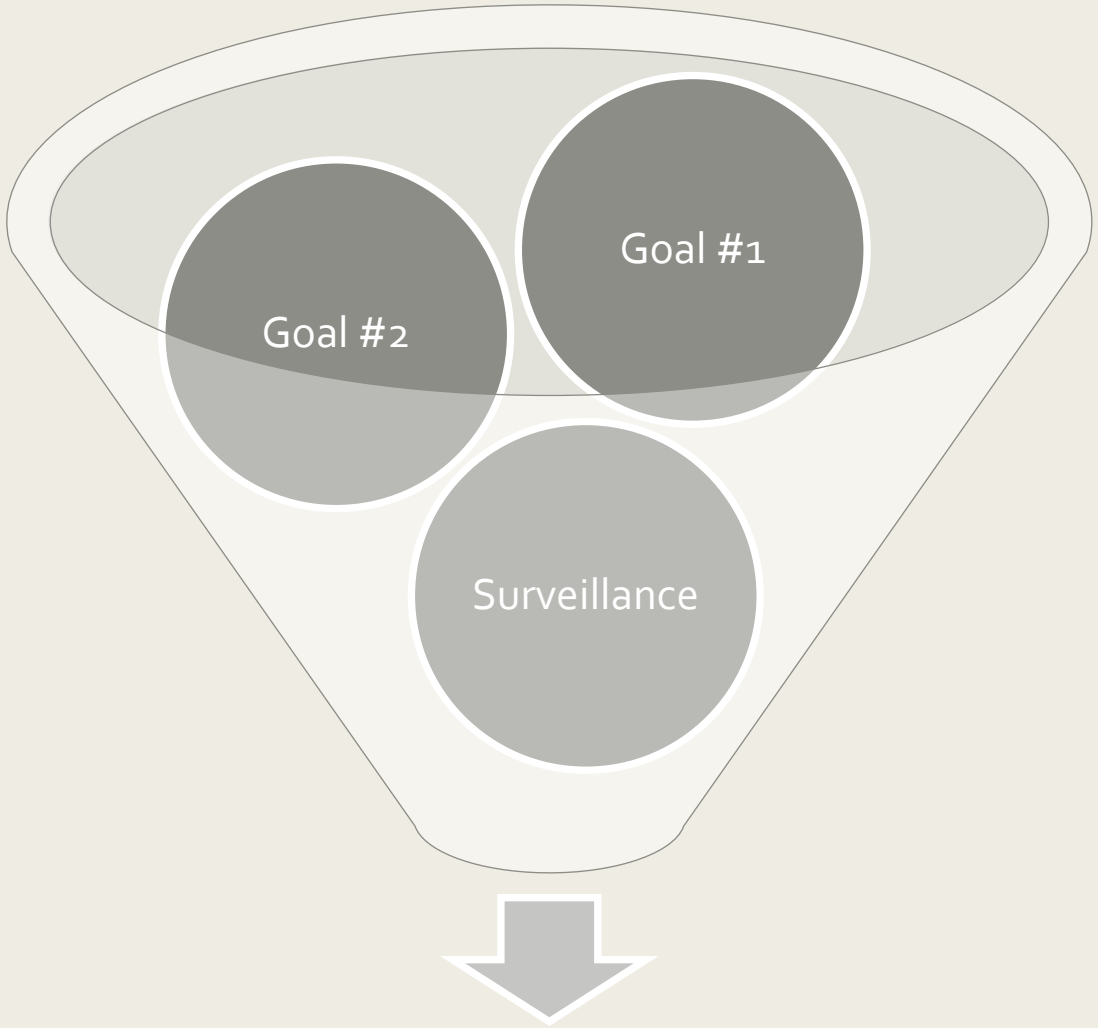
A note on urine cultures

- Appropriate to culture
  - *SIRS criteria without apparent source*
  - *Signs or symptoms of UTI*
  - *Febrile neutropenia*
  - *Urological procedure*
- Do NOT get a urine culture
  - *Urinary catheter*
  - *Altered mental status alone*
  - *Cloudy or malodorous urine*
  - *"Routine" for catheter change*
  - *"Routine" for hospital admission*
  - *Asymp*
- Asymptomatic bacteria
  - *Common in elderly, especially long term care*
  - *Pyuria common in catheterized patients*
  - *Always treat in pregnancy*
  - *Otherwise, do NOT treat unless there is a reason*

3

Minimize antimicrobial resistance

MRSA
CRE
VRE
C. difficile



Prevention

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Role of ED pharmacist

- Clinical consult service
- Guideline development
- Provider education
- Culture follow up
- QA/QI

Clinical consult service

- "My patient has a CD_4 count of 75, what antibiotics should I start?"
- "Can I give cefepime to this patient with a penicillin allergy?"
- "How long should I give this patient antibiotics for?"
- "OB wants to give ceftriaxone IM to my patient but she already got it IV; they said it works better. Should I give the patient more?"
- "How do I dose vancomycin?"
- "Can you just figure out what antibiotics to give and put in the orders?"

Guideline development

All doses based on normal renal function (CrCl >60 mL/min)
Always check flags and previous microbiology cultures. Contact infectious disease or ED pharmacist (2-2560) with any questions
Please refer to Septic Shock Guidelines for patients in septic shock

Pneumonia

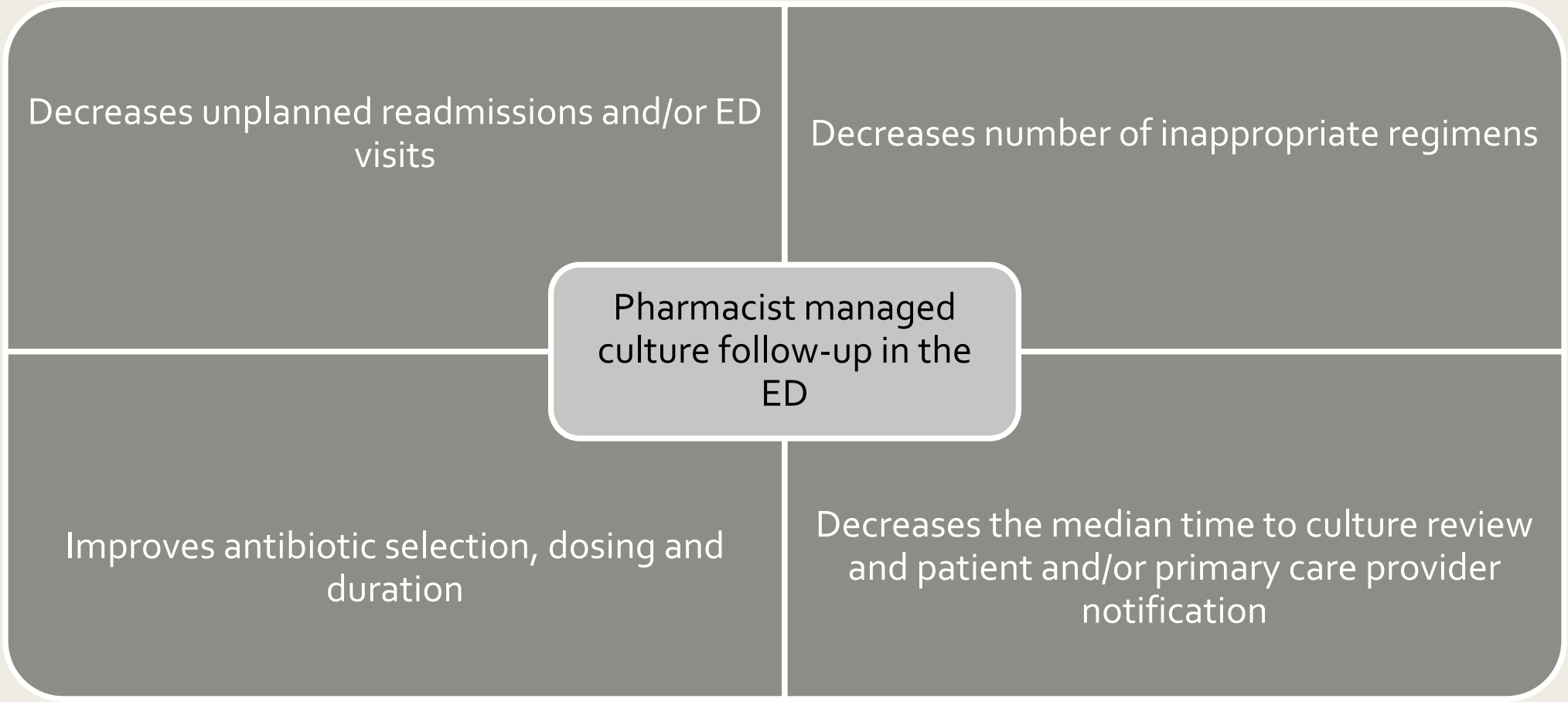
	Recommended	Alternative*	Comments
Community Inpatient	Ceftriaxone 1 g IV **AND** azithromycin 500 mg IV/PO	PCN allergy: Levofloxacin 750 mg IV/PO Macrolide allergy: Ceftriaxone 1 g IV **AND** doxycycline 100 mg IV/PO	IV route recommended for initial inpatient treatment of CAP Order *S. pneumoniae* and *Legionella* urine antigen
Community Outpatient	Amox/clav 875 mg PO Q12H for 5 days **AND** azithromycin 500 mg PO daily for 3 days	Cefuroxime 500 mg PO Q12H for 5 days **AND** azithromycin 500 mg PO daily for 3 days PCN allergy: Levofloxacin 500 mg PO daily for 5 days	
Aspiration	Ampicillin/sulbactam 3g IV		
Critically Ill Inpatient	Ceftriaxone 2 g IV **AND** azithromycin 500 mg IV	PCN allergy: Levofloxacin 750 mg IV	
	Pseudomonal Risk		
	Pip/tazo 4.5 g IV **AND** azithromycin 500 mg IV	Cefepime 2 g IV **AND** azithromycin 500 mg IV Cefepime 2 g IV **AND** levofloxacin 750 mg IV PCN allergy: Levofloxacin 750mg IV	Risk Factors: Prolonged hospital/LTC stay (>5 days), steroids (>10 days), broad spectrum antibiotics in past 30 days, structural lung disease, ANC < 500 Addition of an aminoglycoside can be considered in patients with PCN allergy and concern for *Pseudomonas* infection (amikacin 10 mg/kg adjusted body weight**)
	MRSA Risk		
	Addition of vancomycin 25 mg/kg to above regimen		Risk Factors: Recent influenza, ESRD, IVDU, broad spectrum antibiotics in past 30 days, cavitary infiltrate
Nosocomial	Pip/tazo 4.5 g IV **AND** azithromycin 500 mg IV **AND** vancomycin 25mg/kg	Cefepime 2g IV **AND** azithromycin 500 mg IV **AND** vancomycin 25mg/kg PCN allergy: Levofloxacin 750mg IV **AND** vancomycin 25mg/kg	Addition of an aminoglycoside can be considered in patients with PCN allergy and concern for *Pseudomonas* infection (amikacin 10 mg/kg adjusted body weight**)

Guidelines are intended to be flexible. They serve as reference points or recommendations, not rigid criteria. Guidelines should be followed in most cases, but there is an understanding that, depending on the patient, setting, circumstances or factors, guidelines can and should be tailored to fit individual needs.

Provider education

- Infectious processes
- Local antibiogram and resistance patterns
- PK/PD of antibiotics
- Dosing of antibiotics
- Selection of antibiotics
- Allergies and cross reactivity

Culture follow up by ED pharmacist



Randolph TC, et al. Am J Health-Syst Pharm. 2011; 68:916-919.
Miller K, et al. Am J Emerg Med. 2014; 32(10): 1270-1274.
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Strategies for implementation

Identify stakeholders

- Physicians
- Advanced practice clinicians
- Pharmacists
- Nurses
- Informatics
- C suite

Set realistic goals

- If no ED pharmacists, work with designated ID pharmacist
- If no EMAR integration or order set capability, provide guidelines through other means
  - *Electronic upload of guidelines*
  - *Hardcopy printout*
  - *Email to providers*
- Focus on the low hanging aspects first
- Be patient – change is difficult
- Perform QA/QI assessments periodically

Key takeaways

- Antibiotic stewardship is a focus of the Joint Commission, CDC, CMS
- There is a major role for stewardship within the ED
- ED pharmacists play a major role in the development, implementation and improvement of stewardship programs

Questions?
Comments?

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Thank you!!

References

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