

Antimicrobial Stewardship:

What is it and why do it?

an-ti-mi-cro-bi-al stew-ard-ship: *noun* | [an-tee-mahy-kroh-bee-uh | stoo-erd-ship]

Medicine, Medical, Pharmacology – coordinated interventions designed to improve and measure the appropriate use of antibiotic agents by promoting the selection of the optimal antibiotic drug regimen including dosing, duration of therapy, and route of administration



Why Stewardship?

- Up to 50% of antimicrobial use is inappropriate
- New medications and new classes of medications are slow to develop
- Resistant microbes lead to poor outcomes



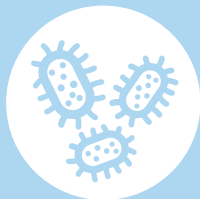
Antimicrobial use in the United States

- Patients in the United States receive approximately 25% more antibiotics than those in the average European country
- In general, antimicrobials are prescribed more often and for longer durations
- Microorganisms develop resistance when exposed to antimicrobials



The slowdown of antimicrobial therapy

- A new class of antimicrobials has not been developed in over a decade
- At the same time, antimicrobial resistance has been worsening
- Therefore, many infections are developing with few to no treatment options
- Now, therapy includes riskier options, including intravenous polymyxin (high toxicity) and desensitization



Resistant microbes lead to poor outcomes

- Increased mortality
- Increased length of stay
- Higher cost to the patient



Antimicrobial Stewardship improved outcomes

- The program slows or reverses antimicrobial resistance
- Therefore, it also improves outcomes, such as mortality and length of stay
- Stewardship programs have been shown to reduce the incidence of *Clostridium difficile* 60%
- It also reduces the incidence of adverse effects from medications

Antimicrobial Stewardship:

Principles of Antimicrobial Stewardship

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Goals of the Program

- Limit the incidence of unnecessary antimicrobial exposure
- Optimize antimicrobial therapy (dose, route, duration of therapy)
- Halt or reverse microbial resistance
- Improve patient outcomes (mortality and morbidity)
- Limit unintended consequences of therapy (adverse drug events, high cost)



Who is involved in antimicrobial stewardship? Everyone!

- Nurses
- Prescribers
- Microbiologists
- Hospital Administrators
- Infection Control
- Pharmacists
- Patients



The slowdown of antimicrobial therapy

- Decision trees and algorithms for initial antimicrobial selection
- Getting cultures early and appropriately (i.e. limit contamination)
- Conducting an antibiotic timeout at 48 hours
 - ✓ De-escalate therapy
 - ✓ Discontinue some or all medications
 - ✓ Continue some or all medications
- Setting stop dates on all therapy
- Dose optimization programs
- IV to PO opportunities
- Practitioner and Patient Education
- Stewardship programs have been shown to reduce the incidence of *Clostridium difficile* 60%
- It also reduces the incidence of adverse effects from medications

Antimicrobial Stewardship:

Nursing Care Plan for Antimicrobial Stewardship

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Initial Selection of Antimicrobials

- Collect cultures early and with meticulous attention to limiting contamination
 - ✓ Late cultures are often negative (after starting antimicrobials)
 - ✓ Contaminated cultures lead to additional therapy
- Check for indications and stop dates on all antimicrobials
- Investigate declared allergies
 - ✓ Verify accuracy of allergy as well as nature of reaction
 - ✓ Patients are often placed on less effective therapy based on a false allergy
 - ✓ “Delabel” non-allergic patients



De-escalation of therapy

- Track and report days of therapy for each antimicrobial
- Track and report overall days of therapy
 - ✓ *Note:* the first dose of an antimicrobial is Day 1
- Conduct an antibiotic timeout at 48 hours
 - ✓ Check cultures as reassess diagnosis
 - ✓ Make a therapy decision to de-escalate, discontinue, or continue therapy
 - ✓ Set a stop date on therapy
- IV to PO
 - ✓ Reduces length of stay
 - ✓ Eligible patients include those with improving condition and/or receiving other oral medications



Additional Considerations

- Document and report adverse drug reactions to antimicrobials
- Monitor choice and duration of antimicrobials in surgical care
- Communicate critical laboratory values and cultures

Antimicrobial Stewardship: *Clostridium difficile* Associated Disease

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Burden of disease

- Increasing in incidence as well as severity
- New hypervirulent strains emit Toxin A, Toxin B, and Binary Toxin
- Leads to severe diarrhea, gastrointestinal shutdown, emergency surgery, and death
- Fortunately, it is largely preventable



What is necessary for disease?

- Presence of microorganism
- Alteration of the normal flora of the gastrointestinal tract (*i.e. antimicrobial therapy*)



How do you prevent disease?

- Enhanced infection control practices limits transmission of *C. difficile*
- Antimicrobial stewardship has been shown to reduce incidence of infection by 60%



Additional considerations

- Wash hands over using alcohol based rubs
- Proton pump inhibitors are highly associated with disease and recurrence