

ANTIBIOTIC STEWARDSHIP

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THE PROBLEM

- **700,000 people die each year from antibiotic resistant infections**
 - **Projected to be >10 million/yr in 2050**
- **Bacteria exposed to antibiotics quickly develop resistance**
- **Much antimicrobial use in the hospital is either unnecessary or inappropriate**

What is Antibiotic Stewardship?

- **New TJC standards**
 - **“New Antimicrobial Stewardship Standards”**
 - **8 elements of performance**
 - **Apply to all acute care hospitals as of January 1, 2017**

What is Antibiotic Stewardship?

- **Coordinated interventions designed to improve and measure the appropriate use of antimicrobials by promoting selection of optimal:**
 - **Antimicrobial drug regimen**
 - **Dosage**
 - **Duration of therapy**
 - **Route of administration**

GOALS OF PROGRAM

- Improve patient health outcomes**
- Minimize toxicity and other adverse events**
- Limit the selection for antimicrobial resistant strains**

What is Antibiotic Stewardship?

- **It is NOT “Antibiotic Prevention”**
- **May reduce excessive costs attributable to suboptimal antimicrobial use**

COST SAVINGS

- **Effective programs show 22%-36% decrease in antimicrobial use**
 - **~\$200,000-\$900,000 annual savings**
- **Decrease in rates of *C. difficile***
- **Decrease in MDROs such as VRE**

STRUCTURE OF PROGRAM

- **ID Physician**
- **Clinical Pharmacist with ID training**
- **Others:**
 - **Clinical Microbiologist**
 - **Information Systems**
 - **Infection Prevention specialists**

PROGRAM METHODS

- **Prospective audit with intervention and feedback**
- **Formulary restriction**
- **Preauthorization requirements**

PROGRAM METHODS

- **Prospective audit with intervention and feedback**

PROSPECTIVE AUDIT

- **Demonstrated in 2 studies to decrease starts and duration of antibiotic use with no adverse effect on clinical outcomes**
- **Another study showed decrease in rate of *C. difficile* and MDRO Enterobacteriaceae**

PROSPECTIVE AUDIT

- **Audit antimicrobial use on a daily basis**
 - **Review all new starts**
 - **Review continuations with micro lab data to assess appropriateness and length of therapy**
- **Intervention with prescribers**
- **Feedback to prescribers and Services**

PROGRAM METHODS

- **Prospective audit with intervention and feedback**
- **Formulary restriction**

FORMULARY RESTRICTION

- **Most effective method of achieving the process goal of controlling antibiotic use**
- **Done through the Pharmacy and Therapeutics (P&T) Committee**

PROGRAM METHODS

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- **Formulary restriction**
- **Preauthorization requirements**

PREAUTORIZATION

- **Effectiveness depends on who is making the recommendations**
- **Program is not designed merely to restrict antibiotic choice, but to guide choice to the optimal antibiotic for the patient**

CHALLENGES

- **Push-back from physicians**
- **“Squeezing the Balloon”**

PROGRAM METHODS

- **Education**
- **Guidelines and Clinical Pathways**
- **Antimicrobial order forms**
- **De-escalation of therapy**
- **Dose optimization**
- **Parenteral to oral conversion**
- **Tracking antimicrobial resistance**

PROGRAM METHODS

- **Education of prescribers and patients**

EDUCATION

- **Essential element of any program designed to influence prescribing behavior**
- **Will enhance and increase acceptance of stewardship strategies**

TJC Standards

- **Hospitals educate staff and LIP about antimicrobial resistance and stewardship practice**
- **Hospitals educate patients and families regarding the appropriate use of antimicrobial medications**
 - **Patients' expectations affect physicians' prescribing behaviors**
 - **CDC has downloadable brochures for education**

EDUCATION

- **Education alone, without active intervention, is only marginally effective and has not shown a sustained impact**

PROGRAM METHODS

- **Education of prescribers and patients**
- **Guidelines and Clinical Pathways**

TJC Standards

- **The hospital's ASP uses organizational approved multidisciplinary protocols**
 - **Focus on disease states that are of high priority and consistent with institution's goals**
 - **Evaluate use and outcomes of guidelines at appropriate time frames**

GUIDELINES

- **Impact has been difficult to measure**
- **Local implementation is difficult**
- **Guidelines must incorporate local microbiology and resistance patterns**

PROGRAM METHODS

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ORDER FORMS

- **Shown to decrease antimicrobial use due to**
 - **Automatic stop orders**
 - **Requirement for physician justification**
- **Hard to implement in a paper-based charting system**

PROGRAM METHODS

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- **De-escalation of therapy**

DE-ESCALATION THERAPY

- **STAGE 1**

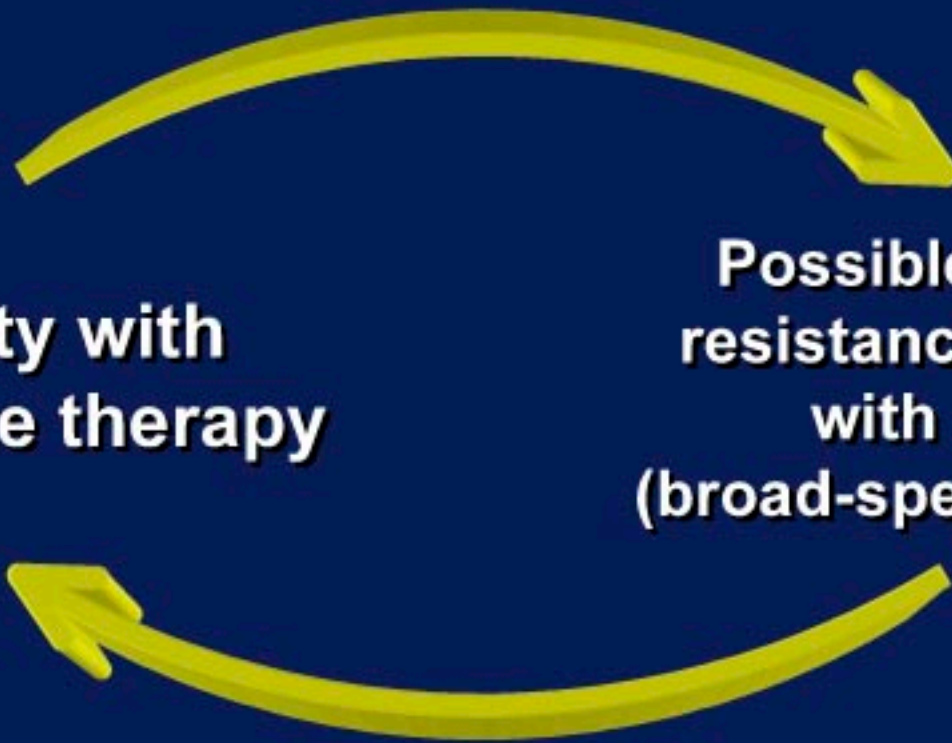
- **Administer the broadest spectrum antibiotic regimen necessary to improve outcomes**

An Art in Medicine

Balance

**Mortality with
inadequate therapy**

**Possible increase in
resistance and toxicity
with adequate
(broad-spectrum) therapy**



DE-ESCALATION THERAPY

- **STAGE 1**

- Administer the broadest spectrum antibiotic regimen necessary to improve outcomes

- **STAGE 2**

- Focus on de-escalating with theoretic goal of:
 - minimizing toxicity and resistance
 - improving cost-effectiveness

GENERAL PRINCIPLES FOR DE- ESCALATION

- **Identify the organism and know its susceptibilities**
- **Assess and modify initial empiric regimen based on susceptibility report**
- **Make the decision in the context of the patient's progress on the initial regimen**
- **Individualize the length of therapy based on patient factors and clinical response**

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IV TO ORAL CONVERSION

- **Many drugs have good oral bioavailability**
- **Randomized studies of oral conversion in CAP and SSTIs show:**
 - **Significant reductions in LOS**
 - **Significant reductions in cost of care**

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WHAT IS THE FUTURE FOR ASP?

- **New diagnostic tests**

RAPID DIAGNOSTIC TESTS

- **Tests that rapidly identify MDROs (MRSA, VRE, etc) after the organism is cultured in the lab**

RAPID DIAGNOSTIC TESTS

- **2010 study with rapid PCR to detect MRSA/MSSA in blood cultures**
 - **Switch from vancomycin to nafcillin or cefazolin was 1.7 days shorter**
 - **Mean LOS was 6.2 days shorter**
 - **Hospital costs \$21,387 less per patient**

RAPID DIAGNOSTIC TESTS

- **Tests that rapidly identify MDROs (MRSA, VRE, etc) after the organism is cultured in the lab**
- **Tests that rapidly identify an organism directly from a patient specimen**
 - **CSF**
 - **Sputum**
 - **Stool**

RAPID DIAGNOSTIC TESTS

- **Issues with RDTs**
 - **Need for an infrastructure that can respond to rapid identifications**
 - **Problems with interpretation of results**
 - **Many respiratory tract organisms are identified, but their significance and how to manage them is not well defined**

WHAT IS THE FUTURE FOR ASP?

- **New diagnostic tests**
- **New antimicrobials?**

WHAT IS THE FUTURE FOR ASP?

- **New diagnostic tests**
- **New antimicrobials?**
- **New and increasing resistance**

THANK

YOU

