Antimicrobial Stewardship and Infection Prevention
Objectives

- Illustrate the link between antimicrobial stewardship and infection prevention
- Review core elements of antimicrobial stewardship, and opportunities for coordination with infection prevention
- Review roles of nursing staff in antimicrobial stewardship programs
Antimicrobial Stewardship and Infection Prevention are Linked

- Antimicrobial Use
- Infection
- Antimicrobial Resistance, *Clostridioides difficile*
- Transmission
Ingest *Clostridioides difficile* spores transmitted to patients via the hands of healthcare personnel and environment.

Changes in lower intestinal flora due to antimicrobial use allows proliferation of *C. difficile* in colon.

Toxin A & B production leads to colon damage.

Two Preventable Events in CDI

The following events may occur separately and in any order, but both are required for infection to occur:

1. The *C. difficile* bacterium or spore is ingested
2. The normal intestinal flora is compromised allowing for *C. difficile* to establish itself and proliferate
Focus Interventions on Preventable Events

1. The *C. difficile* bacterium or spore is ingested
   - Hand hygiene
   - Environmental cleaning and disinfection

2. The normal intestinal flora is compromised allowing for *C. difficile* to establish itself and proliferate
   - Antimicrobial stewardship
Focus Interventions on Preventable Events - continued

1. The *C. difficile* bacterium or spore is ingested
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   - Antimicrobial stewardship
Increased Risk of CDI With Cumulative Antimicrobial Exposure

Antimicrobial Stewardship

• Promote and measure appropriate antimicrobial use by optimizing antimicrobial selection, dosing, route, and duration of therapy
  – Improved patient care, increased cure rates, reduced treatment failures
  – Reductions in hospital rates of CDI and antimicrobial resistance
  – Decreased or controlled costs

Howell et al. Arch Intern Med 2010;170:784–90
Evans and Johnson. Clin Infect Dis. 2015;60(S2):S122-8
Regulatory Mandates

Requirements highlight key roles of infection prevention programs in advancing successful antimicrobial stewardship interventions across the continuum care.
Elements of Antimicrobial Stewardship Programs (ASP)

- **Leadership Commitment:** Dedicate necessary resources
- **Accountability:** Appoint a leader responsible for program outcomes
- **Drug Expertise:** Appoint pharmacist leader responsible for working to improve antimicrobial use
- **Action:** Implement at least one recommended action
- **Diagnosis:** Promote accurate and timely testing, and ensure appropriate indications
- **Tracking:** Monitor antibiotic prescribing and resistance patterns
- **Reporting:** Regularly report information on antibiotic use and resistance to doctors, nurses, and relevant staff
- **Education:** Educate clinicians about resistance and optimal prescribing

What are the Roles and Alignment with Infection Prevention and Nursing?
Leadership Commitment and Accountability: Antimicrobial Stewardship/Infection Prevention Alignment

- Both infection prevention and antimicrobial stewardship programs require
  - Leadership commitment
  - Accountability
  - Multidisciplinary engagement among physician, pharmacist, and nursing champions

- Infection prevention and antimicrobial stewardship are both critical patient safety programs
  - Align strategies to promote, disseminate, measure and sustain best practices
Drug Expertise: Contributions from Nursing Staff

• Nursing staff can obtain and document a detailed allergy history
  • Include details of timing and nature of reaction
• Nursing staff can educate patients and families
  • What constitutes an accurate antibiotic allergy history
**Example**

Penicillin (Beta-Lactam) Allergy Assessments and CDI Prevention

- Patients with reported penicillin (beta-lactam) allergies frequently receive alternative antimicrobials and are at increased risk of CDI
- Penicillin (beta-lactam) allergy assessments and skin testing for patients with reported allergy
  - Improve use of preferred penicillin (beta-lactam) therapy
  - Reduce use of alternative agents with greater CDI risk

ASP Action: Roles of Nursing Staff

- Inform decisions to start antimicrobials promptly upon early signs of likely bacterial infections, including sepsis
- Prompt and participate in discussions about changes in antimicrobial use by evaluating and communicating patients’ clinical status and medical history
  - 48-72 hour antibiotic “timeout” -> stop or narrow therapy
  - Readiness for transition from intravenous to oral therapy
  - History of CDI or other antibiotic complication
- Perform medication reconciliations during patient transitions of care
Example

Avoid Unnecessary Antimicrobial Therapy in Patients with CDI

• Optimal CDI treatment includes stopping or avoiding non-CDI antimicrobial use wherever possible
  
  – “Flag” patients with risk factors or recent CDI and alert prescriber to avoid antibiotics or to use lower-risk agents
  
  – Target patients with CDI diagnoses for medication review to identify and discontinue unnecessary antibiotics
Diagnosis: Nursing and Infection Prevention Roles

- Promote optimal use of diagnostic tests and microbiology cultures
  - Verify reason for test is appropriate
  - Use proper specimen collection technique and transport to a laboratory in a timely manner
  - Ensure specimens are collected before antimicrobials are started
Example

Accuracy of CDI Diagnosis

- Sensitive diagnostic testing methods allow for rapid identification of patients with CDI
  - Prompt initiation of CDI therapy improves patient outcomes
  - Prompt initiation of Contact precautions minimizes transmission risk to others
- Sensitive diagnostic tests sometimes used inappropriately
  - Detect asymptomatic *C. difficile* colonization
  - Initiate unnecessary CDI therapy
Example
CDI Testing

• CDI testing should be limited to symptomatic patients with unformed stool
  • Presence of unexplained and new-onset diarrhea
  • ≥3 unformed stools over 24 hours

• Implement pre-agreed criteria for CDI testing
  • Algorithm to direct proper testing
  • Discontinue laxatives 24-48 hours prior to testing
  • Laboratory rejects testing if formed stool (does not conform to shape of container)
**Clinical C. difficile Testing Protocol**

The protocol does not substitute for clinical assessment and judgment.

**Protocol Initiation Criteria**
1. Age >1 year old.
2. Testing cannot be repeated if already performed within 7 days (regardless of result).
3. For use on day 3+ of inpatient admission (else use Admission Screening Protocol).

**DIARRHEA** = Partial / Entirely liquid stool(s) in ≤ 24 hours (Bristol Stool Scale 6 or 7)

- **NO**
  - Do not test
    - Exception: Symptoms present on admission (Day 1-2). Utilize admission screening protocol.

- **YES**
  - Patient has received laxative or stool softener in the previous 24 hours?
    - **NO**
      - Alternate cause for diarrhea (e.g. short bowel, tube feeding, IBD, medication side effect, etc.)
    - **YES**
      - [Testing NOT Indicated]
        - Patient must be off laxative / stool softener for 24 hours before testing for C.diff.

**Criteria for clinical suspicion of C. difficile met.**
*Initiate order for ONE C. difficile stool test.*
Consider testing for other causes of infectious diarrhea if appropriate

- **Result Negative**
  - Concern for Infectious Diarrhea? (norovirus, rotavirus, enterovirus, etc.)
    - **YES**
      - Initiate/Continue Contact Precautions based on pathogen
    - **NO**
      - [Testing NOT Indicated]
        - Address other clinical causes of diarrhea prior to testing for C.diff.

- **Result Positive**
  - Initiate Spore Precautions
Tracking: Antimicrobial Stewardship / Infection Prevention Collaboration

- Conduct HAI surveillance
  - Use surveillance data to prioritize ASP interventions
- Consult regarding use of NHSN (Hospitals only)
  - NHSN Antimicrobial Use and Resistance (AUR) module tracks and analyzes antimicrobial use and resistance trends
Reporting: Antimicrobial Stewardship / Infection Prevention Collaboration

- Provide feedback of HAI data
  - Clinicians, patient safety and medical executive committees, board of directors, and other stakeholders
- Provide feedback that is timely, frequent, individualized, non-punitive, and customized
Example

Establish CDI Reduction Goals for the ASP

• Include the hospital infection preventionist as an active ASP participant
• Use CDI surveillance data to prioritize ASP interventions
  – Example: Identify locations and service lines with the highest CDI incidence
• Track and report CDI incidence as a primary ASP outcome
Education: Antimicrobial Stewardship / Infection Prevention Collaboration

• Create educational strategies to address each discipline’s clinical interests
  – Include why infection prevention and antimicrobial stewardship is of value to staff and their patients
• Consider team-oriented and problem-based trainings, including multidisciplinary workshops, bedside teaching, and simulation-based training
Nursing as the Hub of Communication for Antimicrobial Use Stakeholders
Antimicrobial Stewardship Across Transitions of Care

• Establish **consistency of practice and messaging** about antimicrobial use across diverse care settings

• Ensure communication of **antimicrobial indication and anticipated duration** when patients transfer between facilities
  – Avoid duplicative or unnecessarily prolonged courses of antimicrobial therapy, which increase CDI risk

• Ensure communication and documentation of **patient symptoms** upon transfer
  – Ensure appropriate diagnostic testing and infection control measures implemented promptly
Interfacility Transfer Communication Tool

- Document antimicrobials patient is receiving, including
  - Antimicrobial name, dose, frequency
  - What infection is being treated
  - Start and anticipated stop dates
Summary

• Antimicrobial stewardship and infection prevention programs complement each other to promote patient safety

• Infection prevention and nursing staff have critical roles to play in antimicrobial stewardship programs
### Questions?

For more information, please contact

HAIProgram@cdph.ca.gov

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