CDPH HAI Program Updates

Erin Epson, MD
Healthcare-Associated Infections (HAI) Program
Center for Health Care Quality
California Department of Public Health

Objectives

• Describe recent examples highlighting the importance of antimicrobial stewardship to address emerging antimicrobial resistance threats in California

• Discuss HAI Program initiatives, resources and tools for implementing antimicrobial stewardship across the healthcare continuum in California
Candida auris

What patient factors are associated with C. auris colonization in vSNFs.

Certain broad-spectrum antibiotics were associated with C. auris colonization.

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levofloxacin</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Piperacillin</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Cefepime</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Vancomycin</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>Meropenem</td>
<td>4.4</td>
<td></td>
</tr>
</tbody>
</table>

Slide courtesy of John Rossow, CDC Epidemic Intelligence Service
Systemic antifungals were not associated with colonization.

- Levofloxacin: 0.8
- Piperacillin: 1.3
- Cefepime: 1.6
- Vancomycin: 2.7
- Meropenem: 4.4
- Any systemic antifungal: 1.5

Odds Ratios with 95% Confidence Intervals

Factors associated with colonization with *C. auris* after controlling for confounders*:

- Mechanically ventilated: 5.9
- Any ACH visit in the 6 months before PPS: 4.9
- Received meropenem in 90 days before PPS: 3.1

Adjusted Odds Ratios with 95% Confidence Intervals

*Each characteristic was assessed with its own multivariable model, with potential confounders selected using DAGs and *a priori* information.

Slide courtesy of John Rossow, CDC Epidemic Intelligence Service.
VIM-producing Pseudomonas Surgical Site Infections

- Verona integron-encoded metallo-β-lactamase–producing carbapenem-resistant *Pseudomonas aeruginosa* (VIM-CRPA)
  - High levels of antibiotic resistance
  - Potential for rapid spread in health care facilities

- As of January 18, 2019, 12 cases of VIM-CRPA infections in patients who underwent invasive procedures at five hospitals in Tijuana, Baja California
  - Six patients hospitalized in the United States

---

### VIM-CRPA Microbiology Report

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>MIC</th>
<th>Resistant</th>
<th>ug/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>&gt;32</td>
<td>Resistant</td>
<td></td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>&gt;16</td>
<td>Resistant</td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>&gt;2</td>
<td>Resistant</td>
<td></td>
</tr>
<tr>
<td>Gentamicin</td>
<td>8</td>
<td>Intermediate</td>
<td></td>
</tr>
<tr>
<td>Imipenem</td>
<td>&gt;8</td>
<td>Resistant</td>
<td></td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>&gt;4</td>
<td>Resistant</td>
<td></td>
</tr>
<tr>
<td>Piperacillin + Tazobactam</td>
<td>64/4</td>
<td>Intermediate</td>
<td></td>
</tr>
<tr>
<td>Tobramycin</td>
<td>&gt;8</td>
<td>Resistant</td>
<td></td>
</tr>
</tbody>
</table>
Antimicrobial Stewardship Across the Continuum of Care in California

- Hospitals
  - Legislation
  - Spotlight project, toolkit, statewide collaborative, promoting NHSN AU Option

- Skilled Nursing Facilities
  - Legislation
  - Webinar series, toolkit

- Health care facility networks
  - Regional AR prevention collaboratives, toolkit

- Outpatient settings
  - Emergency Departments
  - Clinics
  - Dentistry

National Healthcare Safety Network

- Patient Safety
- Healthcare Personnel Safety
- Biovigilance
- Long-term Care
- Dialysis
- Device Associated Infections
- Procedure Associated Infections
- MDRO/CDI
- Antimicrobial Use and Resistance Module
- Antimicrobial Resistance Option
- Antimicrobial Use Option

Erin Epson, M.D.
Objectives of NHSN AU Option

- **Primary**
  Facilitate risk-adjusted inter- and intra-facility benchmarking of antimicrobial usage via Standardized Antimicrobial Administration Ratios (SAAR)

- **Secondary**
  Evaluate trends of antimicrobial usage over time at the facility, state/regional and national levels

Facilities Reporting to NHSN AU Option – United States

*As of October 1, 2018*
Percentage of Facilities Reporting to NHSN AU Option, by State

25 Adult SAARs (2017 baseline)

- All antibacterial agents
- Broad spectrum antibacterial agents predominantly used for hospital-acquired infections
- Antibacterial agents predominantly used for resistant gram-positive infections (e.g., MRSA)
- Narrow spectrum beta-lactam agents
- Antibacterial agents posing the highest risk for CDI
- Antifungal agents predominantly used for invasive candidiasis

Erin Epson, M.D.
CDPH Toolkit for California Hospitals
Tracking Antimicrobial Use and Resistance

How to Participate

To participate in either the AU or AR option of the AUR module, hospital personnel responsible for reporting NHSN data must coordinate with their laboratory and/or pharmacy information software providers to configure their systems to generate standard formatted reports for importation into NHSN. The format for data submission follows the Health Level 7 (HL7) Clinical Document Architecture (CDA). Manual data entry is not available for the AUR module. Hospitals can participate in one (AU or AR) or both (AU and AR) options, and can implement them in either order.

When to Start (either AU or AR)

• If your hospital is in the decision-making process, begin with Element 1 for guidance on software solution approaches and investments.
• If your hospital has started the implementation process, jump to Element 3 for guidance on data verification and submission.

<table>
<thead>
<tr>
<th>Antimicrobial Use (AU) Implementation Elements</th>
<th>Antimicrobial Resistance (AR) Implementation Elements</th>
</tr>
</thead>
</table>

NHSN AUR Learning & Implementation Collaborative

- Support and foster a community of local hospitals using the NHSN AU and AR options
- Share lessons learned, ask questions regarding implementation of the AU and AR options
- Discuss ways to use the AU and AR options to support effective antimicrobial stewardship and infection prevention activities
- Help increase the number of hospitals submitting AU and AR data, and generate more accurate benchmarks

Email me if you’re interested in participating in the collaborative!
Public Health - Academic Partnership to Improve Antibiotic Prescribing in ED

Prescription Pad: Symptom Relief for Viral Illnesses

Erin Epson, M.D.
Health Care Provider Commitment Poster

SU SALUD ES IMPORTANTE PARA MI.

Inserte la foto del proveedor de salud

LE GARANTIZO QUE HARÉ LO MEJOR PARA PRESCRIBIR ANTIMICROBIANOS SOLO CUANDO USTED LO NECESITE.

Firma: 
Su Proveedor de Salud

Los antibióticos no funcionan para ciertas infecciones como el resfriado común, la tos y la mayoría de los dolores de garganta. Tomar antibióticos cuando no funcionan puede hacer más daño que beneficio y provocar reacciones alérgicas o infecciones graves por diarrea.

Health Care Provider Commitment Poster

Erin Epson, M.D.
Summary

• Recent examples highlight the importance of antimicrobial stewardship to address emerging antimicrobial resistance threats in California

• CDPH HAI Program initiatives provide resources and tools for implementing antimicrobial stewardship across the healthcare continuum in California