Adobe Connect Housekeeping

• All lines have been muted
• Press *6 to unmute your line
• Also can use the chat box to ask questions/comment
NHSN Antibiotic Use Reporting Implementation

- Day-long training session
- October 30, 2019, 7:30 – 4:00
- Belmont University, Nashville, TN
Training Agenda

• 7:30–8:15  Registration
• 8:15–8:30  Welcome and TN Progress
• 8:30–8:45  NHSN AU Option Basics
• 8:45–9:45  Getting Leadership on Board
• 9:45–10:00 Break
• 10:00–11:00  Implementation First Steps
• 11:00–12:00  System Wide Implementation
• 12:00–1:00  Lunch
• 1:00–3:00  NHSN AU Output, Data Validation, and Using AU Data for Action
• 3:00–4:00  Overcoming Software and Implementation Barriers Panel
Save the Date!

4th Annual Middle Tennessee Antimicrobial Stewardship Symposium

Friday, January 31, 2020
Belmont University
Nashville, TN

Featuring Lectures, Round Table Sessions, and Poster Sessions
CMS Conditions of Participation

• New rule requires antibiotic stewardship program in all US hospitals!

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Medicare & Medicaid Services
42 CFR Parts 403, 416, 418, 441, 460, 482, 483, 484, 485, 486, 488, 491, and 494
[CMS-3346-F; CMS-3334-F; CMS-3295-F]
RIN 0938-AT23
Medicare and Medicaid Programs; Regulatory Provisions to Promote Program Efficiency, Transparency, and Burden Reduction; Fire Safety Requirements for Certain Dialysis Facilities; Hospital and Critical Access Hospital (CAH) Changes to Promote Innovation, Flexibility, and Improvement in Patient Care
TDH AU PP Survey

• Next deadline – October 31 for all data for Q3 2019

• Anticipate Q3 Reports by Mid November

• Questions contact:
  – christopher.evans@tn.gov
US Antibiotic Awareness Week

- November 18–24, 2019
- Mark your calendars now!

- Educational and promotional materials available at CDC
  - https://www.cdc.gov/antibiotic-use/week/overview.html
USAAW Ways to Participate

• **Share** social media messages, images, and animated graphics on your organization’s social media channels.
  – Remember to use #USAAW19 and #BeAntibioticsAware in every post!

• **Include** information about *Be Antibiotics Aware* and U.S. Antibiotic Awareness Week in your organization’s print and e-newsletters.

• **Print and share** handouts and posters with patients and healthcare providers.

• **Play** videos (available in English and Spanish) on iPads and TV screens in your medical office, pharmacy, waiting room, or lobby.
USAAW Release of New Core Elements

- To be released during USAAW
- More detail on core interventions
  - Audit and Feedback
  - Pre-authorization
Updated Hospital Core Elements

Foundational Interventions (PA, PAF, Local Guidelines)

- Infection Based Interventions
- Provider Based Interventions
- Pharmacy Based Interventions
- Microbiology Based Interventions
- Nursing Based Interventions
Antimicrobial Resistance Challenge

• US Government yearlong effort to accelerate the fight against antimicrobial resistance

**Tracking and data:** Share data and improve data collection

**Infection prevention and control:** Reduce the spread of resistant germs

**Antibiotic use:** Improve appropriate antibiotic use (sometimes called antibiotic stewardship), including ensuring access to these drugs

**Environment and sanitation:** Decrease antibiotics and resistance in the environment, including improving sanitation

**Vaccines, therapeutics, and diagnostics:** Invest in development and improved access
Antibiotic resistance is in every region of the world and every state in the United States.
The Tennessee Department of Health commits to improving antibiotic use with a required state mandate that all acute care facilities report antibiotic use into Centers for Disease Control and Prevention’s National Healthcare Safety Network Antimicrobial Use and Resistance Module, beginning with the largest facilities by January 1, 2021.
Join the Challenge

New CDC Threat Report Coming

- As early as next month
- Electronic health record data from >700 hospitals (20% of US hospital discharges)
- Updated attributable mortality and cost estimates
- Trends 2012–2017
### Vancomycin Monitoring

#### AUC/MIC in Bacteremia

*Why troughs don’t matter…*

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<tr>
<td>Design</td>
<td>Retrospective observational cohort study</td>
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</table>
| Patients  | Adult patients with MRSA bacteremia (n=127)  
Dialysis patients excluded |
| Results   | Lower treatment failure in patients who achieved AUC$_{24}$/MIC $\geq$ 398: 23.4% vs 54% ($p<0.01$)  
Source-specific AUC$_{24}$/MIC targets = 440, 363, and 330 for high, intermediate and low-risk sources, respectively |

---

![Graph showing AUC/MIC in bacteremia](chart.png)
Vancomycin Monitoring

**Therapeutic Vancomycin Monitoring**

**New United States Guideline**

*Draft Recommendation – May Change After Final Review*

- **AUC\textsubscript{24}:MIC\textsubscript{BMD} of 400 to 600**
  - Most common MIC\textsubscript{BMD90} of 1 mg/L
  - No robust outcome data in pediatrics

- Trough only monitoring is **no longer recommended**
Vancomycin Monitoring

Implementation Strategies

Plan & Educate

- 2019 Vancomycin Guidelines: Bayesian-derived AUC
- This is a Paradigm Shift – Don’t Underestimate
- Target Audience:
  - Pharmacists – Theory, Clinical Data Review, PK/TDM Refresher, Software Education & Competency
  - Physicians – Theory (lite), Changes in TDM & Clinical Data Review
  - Nurses – Theory (lite) & Changes in TDM

Prioritize

- Select population who will most likely benefit from 1 vs 2 levels
- Outcomes metrics

Tools

- First-order pharmacokinetic equations (Excel or on-line tool)
- Computerized (software) application of Bayes theorem
Audience Response

- Is anybody monitoring vancomycin AUC: MIC?
- Practical and/or logistical challenges?
- New vancomycin guidelines pending…still…
Recent oral therapy studies

OVIVA & POET take-home

Step-down to oral therapy reasonable alternative for selected patients with bone and joint infections and endocarditis

• Remaining questions
  • Specific pathogens: MRSA, P. aeruginosa
  • Role of / Need for initial IV antibiotics
  • Role of rifamycins
  • Choice of agents
  • Antibiotic duration with either IV or oral options
  • Role of the host: immunocompromise, IVDU

Boucher NEJM 2019;380:487-9
Combination therapy for MRSA bacteremia

- Open-label RCT
- Superiority
- 27 sites: Australia, New Zealand, Singapore, Israel
- 356 patients
  - MRSA bacteremia
  - <72 hours from culture
  - >90% ID consult & echo

Randomize

Standard: vanco OR dapto

&

Combination: standard + anti-Staph β-lactam

Primary outcome:
Composite at 90 days:
1. all-cause mortality
2. persistent bacteremia ≥day 5
3. micro relapse
4. micro treatment failure

Davis et al. ECCMID abstract L0014
CAMERA-2

What happened?

Antibiotics used:
Standard (n=178)
- vancomycin 100%
- daptomycin 3%

Combination (n=174)
- vancomycin 98%
- daptomycin 4%
&
- flucloxacillin 81%
- cephazolin 23%

• Primary outcome: no difference
• Improved clearance with combo

Acute kidney injury
• 6% v 24% mono v combo
• 35% vanco/fluclox
• 7% vanco/cefazolin

Davis et al. ECCMID abstract L0014
Combination therapy for MRSA bacteremia

Gerik et al.

- Open-label RCT
- Superiority
- 3 US centers
- 40 patients
  - MRSA bacteremia
  - <72 hours of antibiotics
  - <72 hours from culture

Randomize

Standard:
- vanco (n=21) OR
dapto 8mg/kg (n=2)

&

Combination:
dapto 8mg/kg +
ceftaroline (n=17)

Study stopped early
for mortality benefit.

% patients with outcome

<table>
<thead>
<tr>
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<th>in-hospital mortality</th>
<th>D90 mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>Combination</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Duration of Gram Neg Bacteremia

Duration for Gram-negative Bacteremia

- Open-label RCT
- Non-inferiority (10%)
- 3 sites: Israel (2), Italy (1)
- 604 adult patients
  - Mono-GNR bacteremia
  - Survival until day 7
  - ≤1 day positive cultures
  - Stable, normothermic
  - No uncontrolled focus
  - No neutropenia for 48 hrs
  - No HIV
  - No recent allo-HSCT

Randomize

7-day course

14-day course

Primary outcome composite at 90 days
1. All-cause mortality
2. Relapse of bacteremia
3. Local suppurative complications
4. Distant complications
5. Readmission
6. >14-day hospital stay

Day #1 = first day of in vitro active antibiotics

Yahav et al. CID 2019; 69(7):1091-8
Duration of Gram Neg Bacteremia

- Stable patients with Enterobacteriacea bacteremia d/t urinary source may be safely treated with 7d

- ???
  - Other GNR bacteremia?
  - Need for follow up cultures?
  - Other types/non stable patients?
Trials for Carbapenem-Resistant Bacteria

- Tango II – meropenem/vaborbactam vs. best available
  - Numerically better outcomes in meropenem/vaborbactam
  - Underpowered
- CARE Study – colistin vs. plazomicin
  - Stopped early d/t lack of feasibility and low enrollment
- RESTORE IMI 1 – imipemen/relebactam vs imipenem plus colistin
  - 35 centers….31 patients
  - No difference in primary outcome (favorable overall response)
  - Secondary outcomes (e.g. aki and 28 day mortality) numerically better with imipenem/relebactam

McKinnell et al. NEJM 2019; 380: 791-3
Motsch et al. CID 2019; in press
Trials for Carbapenem-Resistant Bacteria

• Take home – Really difficult trials to do
• Colistin consistently performed worse
• Still not sure where combination therapy fits in?
• How to deal with emergence of resistance?
Impact of a Prescriber-Driven Antibiotic Time-out on Antibiotic Use in Hospitalized Patients

Kerri Thom, Pranita Tamma, Anthony Harris, Kathryn Dzintars, Daniel Morgan, Shanshan Li, Lisa Pineles, Arjun Srinivasan, Edina Advic, Sara Cosgrove

Pre-implementation
6 months

Antibiotic-time out for select abx at days 3-5

Post-implementation
9 months

1541 abx courses

6 hospital in Maryland

1929 abx course

77% Abx time out completed


Thom et al. CID 2019; 68(9): 1581-84
Reduction of inappropriate antibiotics compared to baseline; (45% vs 31%, p <0.05)

**Bottom Line:** Time out alone should not replace PAF and/or PA by stewardship team.
Adverse Effects with Long Surgical Prophy

JAMA Surgery | Original Investigation
Association of Duration and Type of Surgical Prophylaxis With Antimicrobial-Associated Adverse Events
Westyn Branch-Elliman, William O’Brien, Judith Strymish, Kamal Itani, Christina Wyatt C, Kalpana Gupta

Multi-center retrospective cohort study across 109 Veterans Affairs Hospitals, Oct 2008-Sept 2013

- **Cohort:**
  - Veterans who underwent cardiac, orthopedic total joint replacement, colorectal, and vascular procedures
    - Part of VA External Peer Review Program for details of surgical prophylaxis regimens
  - 79,058 patients (49% orthopedic, 27% cardiac, 14% colorectal; 9%vascular)
    - Median duration of antibiotics: 18.5 hrs after skin closure
    - Antibiotic: 70% beta-lactam; 25% vancomycin

Branch-Elliman et al. JAMA Surg 2018; 154(7): 590-98
Adverse Effects with Long Surgical Prophy

**JAMA Surgery | Original Investigation**

**Association of Duration and Type of Surgical Prophylaxis With Antimicrobial-Associated Adverse Events**

Westyn Branch-Elliman, William O’Brien, Judith Strymish, Kamal Itani, Christina Wyatt C, Kalpana Gupta

- **Results** (after adjustments for facility, patient and surgical confounders),
  - If received > 24 hours of surgical prophylaxis,
    - No reduction in surgical site infx
    - Risk of AKI and CDI increases with duration

- **Bottom Line**: Harm was associated with every additional day of unnecessary antibiotic therapy.
THA MRSA Update
THA Action Plan Recommendations

• Adoption of CDC Guidance Core Strategies focused on MRSA transmission among high-risk patients during high-risk periods
  – ICU patients - CHG daily bathing while in ICU with nasal decolonization
  – High-risk surgeries (cardiothoracic, orthopedic and neurological surgeries) - Preoperative CHG bathing with nasal decolonization
  – Supplemental strategies based on performance and risk assessment

• All hospitals conduct a risk assessment and gap analysis to address the CDC recommendations for overall infection prevention practices and adopt supplemental strategies as needed to address individual facility risks
THA Action Plan

• Education Plans
  – Established an advisory committee of local infection prevention experts
  – Webinar/Collaborative series to support implementation with national experts and local success sharing
  – Campaign approach
  – Enlist support and partnerships with key stakeholder groups

• Education materials for hospitals, including toolkit of resources

• Public outward-facing campaign after implementation begins
Responding to Brad

• Will it affect stewardship interventions that rely on MRSA screening?
  – Yes
  – Counter? – How will decolonization affect continued need for empiric vancomycin

• TCPS Slides from Kickoff Workshop
Audience Response

• Which product are you using/thinking about using in your decolonization protocols?

• Mupirocin
• Nozin
• Iodophore
Upcoming Webinar with Dr. Huang

- Practical Decolonization Strategies for Special Populations and Addressing Implementation Challenges
- October 23, 2019 12:30 – 1:30 PM CDT
- Q&A with Dr. Huang

Registration Link:
- https://register.gotowebinar.com/register/8852769948882746625
Next Steps

• Next Call
  – December 10 at 2pm Eastern/1pm Central Time

• Opportunities for involvement
  – Upcoming trainings
    • THA MRSA Webinar – October 23
    • AU Reporting Symposium – October 30
    • Belmont Symposium – January 31, 2020
  – Participate in USAAW
    • We want to hear how you promote antibiotic awareness!
  – Seeking volunteer for discussing Pneumonia Guidelines on December call

• Feedback always appreciated
  – Christopher.evans@tn.gov