North Carolina SPICE
Statewide Program for Infection Control & Epidemiology

North Carolina Clinical Antibiotic Stewardship Partners

INPATIENT ANTIMICROBIAL STEWARDSHIP SESSION #3

May 10, 2023

CONFLICT OF INTEREST DISCLOSURES

- The views and opinions expressed in this series are those of the speakers and do not reflect the official policy or position of any agency of the US or NC government or UNC.
- Our speakers have the following financial relationships with the manufacturer(s) and/or provider(s) of commercial services discussed in this activity:
  - Dr. Kistler served as a consultant for Base10, Inc on their UTI embedded clinical support tool and received funding from Pfizer to study pneumococcal carriage.
  - Dr. Willis has performed contracted research with: Pfizer (pediatric nirmatrelvir-ritonavir and maternal RSV vaccine), Novavax (pediatric COVID-19 vaccine), and Merck (monoclonal antibody for RSV prevention)
  - Ms. Doughman owns individual Gilead stock.
- The speakers do not intend to discuss an unapproved/investigative use of a commercial product/device in this series, and all COI have been mitigated.
- These slides contain materials from a variety of colleagues, as well as the CDC, WHO, AHRQ, etc.

INTRODUCTIONS

Please put your name, hospital, and location in the chat!

OUTLINE OF TODAY'S SESSION

- Housekeeping
- Review from last session
- CDC Core Element #4: Concluding discussion
- CDC Core Elements #5: Tracking to support stewardship
- Discussion and "Homework"

CME AND CE CREDIT

- CME & CE for participants
  - Attendance and active participation per learning session
  - Click the link in the chat during the session to document your attendance
  - Complete surveys as requested

ASSIGNMENT FROM LAST SESSION

- What's the status of patient-specific ASP strategies (preauthorization and prospective audit) in your facility?

- Are these activities optimized?
  - Do restricted antimicrobials sometimes get through?
  - Do you have enough IT support and personnel for prospective audit?

CORE ELEMENT #4: **ACTION**

"IMPLEMENT INTERVENTIONS… TO IMPROVE ANTIBIOTIC USE"

Patient-specific	System wide
Prospective audit and feedback*	**Facility-specific treatment guidelines***
-Bug-drug mismatch/de-escalation	Promote routine individual antibiotic process review i.e. "time out"
-Drug specific monitoring	Clinical decision support systems
-Disease-specific monitoring	Cumulative susceptibility report (antibiogram)
-Optimize route of administration	Drug/Disease state treatment review
-Duration of therapy	Formulary Management, shortage management
Optimize antimicrobials for next level of care	Antimicrobial dosing recs
Preauthorization of certain drugs/classes*	Micro lab output optimization strategies, diagnostic stewardship

Examples, list not all-inclusive

* CDC "priority" interventions,
TJC Elements of Performance, 2023→

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BREAKOUT GROUP DISCUSSION

- What facility-wide strategies do you have in place (*or* have you tried) to facilitate antimicrobial decision-making?
- What did you learn as you implemented these? How did you learn this?
- What one or two facility-wide stewardship strategies do you envision implementing at your facility?

System-wide strategies to improve antimicrobial use
Facility-specific treatment guidelines*
Promote routine individual antibiotic process review i.e. “time out”
Clinical decision support systems
Cumulative susceptibility report (antibiogram)
Drug / Disease state treatment review
Formulary Management, shortage management
Antimicrobial dosing recs
Micro lab output optimization strategies, diagnostic stewardship

CONDITION-SPECIFIC GUIDELINES

- Focus on microbiologic diagnosis
  - 2 peripheral blood cultures for sepsis
  - Bone biopsy for decubitus ulcers with suspected osteomyelitis
- Rational empiric therapy
  - Once it starts, it can be hard to change ("but they got better on vanc and pip-tazo!")
  - Incorporate antibiogram data
- Targeting therapy, de-escalation, duration

PRIORITIZING CONDITIONS

- A good target condition:
  - Relatively frequent
  - Broad-spectrum antibiotics often used and/or diagnostic criteria vague
  - Unjustifiable variance
  - Guidelines available from a reputable source (ATS, IDSA, etc)

- Must have stakeholder buy-in
  - “Make it easy to do the right thing”

BENEFITS OF CONDITION-SPECIFIC GUIDELINES

Challenge to Address	Example
Excess variance in decision-making	Sepsis: speed is the priority
Inadequate diagnostic samples	Obtaining bone biopsies for deep decubitus ulcers
Overuse of Low-Specificity Cultures	Diagnostic stewardship of ICU respiratory cultures
Difficulty coordinating subspecialists	Diabetic foot infections
Overuse of high-value drugs	C-diff guidelines with fidaxomicin positioning
Targeting antibiotics and duration	Pretty much everything!

CORE ELEMENT #5: TRACKING

- Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.

- Antibiotic Use Measures
  - NHSN Antibiotic Utilization (AU) Reporting
- Outcome measures
  - *C. difficile* infections
  - Antimicrobial resistance (AR)
  - Financial Impact
- Process Measures for quality improvement
  - Do our AS processes work? How often? To what effect?

NHSN AU & AR MODULES

- Creates a centralized, standardized institutional database
  - Antimicrobial use data
  - Pathogen resistance data
  - Patient demographic data
- Utilizes pre-built analysis tools
  - Local analysis
  - Indices for benchmarking across institutions
- AU & AR are together termed “AUR” in CDC/NHSN documents

https://www.cdc.gov/nhsn/psc/aur/
https://www.cdc.gov/nhsn/pdfs/cda/PHDI-Facility-Guidance-508.pdf

CMS GOAL: REQUIRING AUR MEASURE WILL ENABLE THE DEVELOPMENT OF A TRUE NATIONAL PICTURE OF THE THREAT POSED BY ANTIMICROBIAL OVERUSE AND RESISTANCE

- Requiring AUR reporting through CDC's NHSN would produce inpatient benchmarks that can be used to guide clinical and public health action
- The extensive voluntary participation in NHSN's AUR surveillance indicates that thousands of hospitals see value in NHSN's AUR surveillance. However, incomplete participation in NHSN's AUR surveillance limits the generalizability of the AUR data
- The benefits of monitoring AUR data for patient care and public health are most likely to be achieved when data collection and analysis are systematic, standardized, and achieve complete coverage across eligible facilities

AUR = Antibiotic Use and Resistance

ANTIMICROBIAL USE MEASURES

NUMERATOR

- Usually derived from EHR
- Purchasing data
- Doses administered
- Grams administered (Defined Daily Doses)
- Days on therapy
- NHSN: "Antimicrobial day"

DENOMINATOR

- Usually derived from ADT data
- Patient days
- Per admissions (NHSN secondary option)
- NHSN: "days present"

Rate of Antimicrobial Days per 1,000 Days Present

$$\frac{Drug\ specific\ antimicrobial\ days\ per\ patient\ care\ location\ per\ month}{Days\ present\ per\ patient\ care\ location\ per\ month} \times 1000$$

NHSN AU REQUIREMENT: ANALYSIS TOOLBOX

- NHSN includes a powerful analysis engine. Once you have uploaded data, analyzing doesn't require further input from your local IT department, just a bit of training in the use of NHSN software.

- Two sample analysis indices:
  - SAAR: Standardized Antimicrobial Administration Ratio (SAAR), a metric developed by CDC to analyze and report antimicrobial use data in summary form. Predicted Antimicrobial use is a benchmark index generated by NHSN.

  - (AU-CAD) = Antimicrobial Use Cumulative Attributable Difference
    The AU-CAD represents the difference between the observed days and a selected Standardized Antimicrobial Administration Ratio (SAAR) target.

$$SAAR = \frac{Observed\ Antimicrobial\ Use}{Predicted\ Antimicrobial\ Use}$$

- Training is readily available in the use of the toolbox

van Santen KL, Edwards JR, Webb AK, et al. The Standardized Antimicrobial Administration Ratio: A new metric for measuring and comparing antibiotic use. CID 2018; 67:179-85

ANTIBIOTIC RESISTANCE REQUIREMENT (AR)

- An analysis platform that uses monthly uploaded:
  - Microbiology Lab data via institution Laboratory Information System (LIS)
  - Patient volume data from institution ADT system
  - Some pre-upload processing of data is required (e.g. removal of duplicate positive isolates, adjustment for selective or cascaded reporting)
- Platform includes tools for development of:
  - Pathogen susceptibility rates, by location
  - Multiple antibiogram subsets
  - Benchmarking reports using a “predicted” susceptibility rate

NEW IN 2023: REVISIONS TO ACTIVE ENGAGEMENT

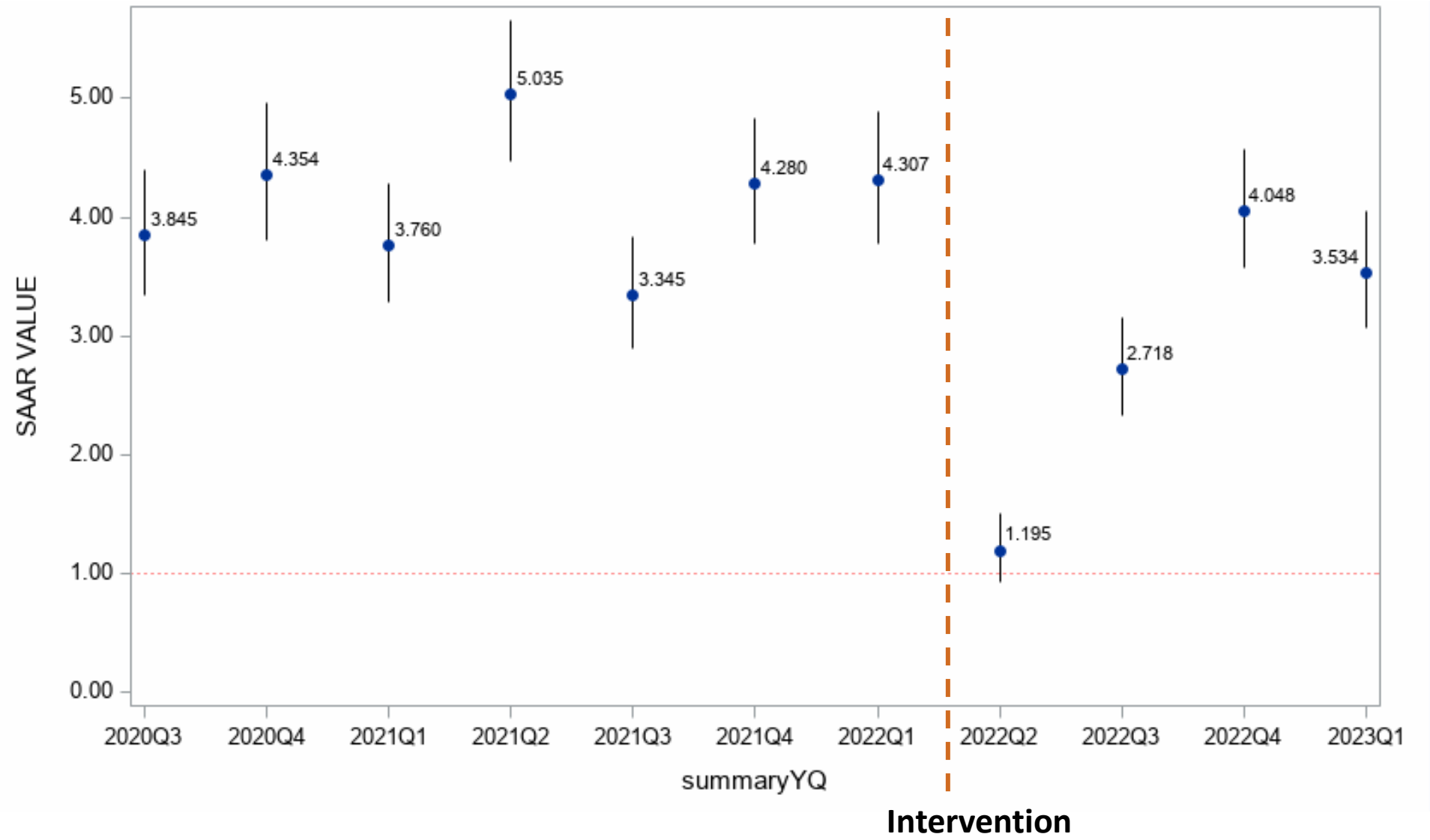
Starting in 2023, CMS is reducing active engagement to two options:

1. Pre-production and Validation (a combination of registration to submit data and testing/validation)
2. Validated Data Production

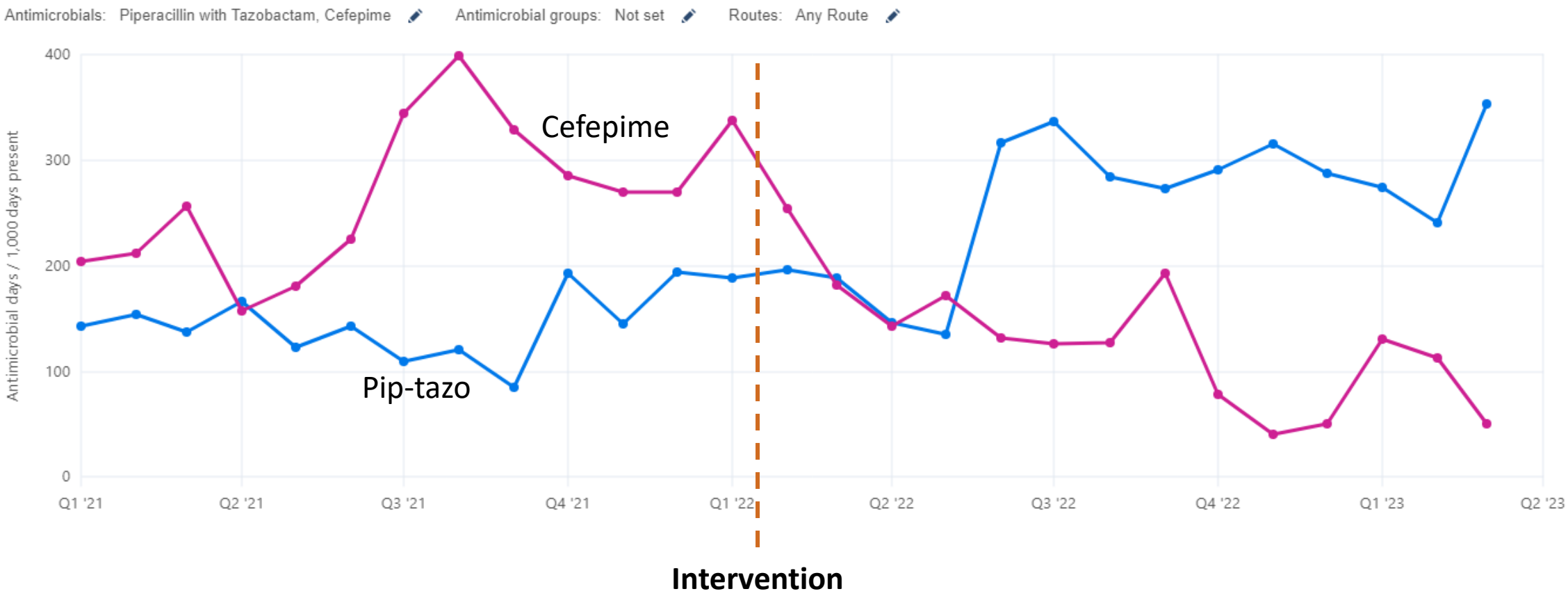
- The hospital must now specify their level of active engagement for each public health measure and can only stay in pre-production and validation for 1 year
- The ask is that starting in 2024 accredited hospitals complete AUR reporting in NSHN and have a report saved from NSHN in case of audit.
  - Hospitals must be testing the data in 2024 or actively sending the data.
  - Hospitals only need to save the report for 1 self-selected quarter.
  - Hospitals are required to save the documentation for 7 years following the reporting year.

BRIEF EXAMPLES OF AU DATA USE

ANTIFUNGAL USE IN AN ICU – SAAR DATA



INDIVIDUAL BREAKOUTS, DOT/1000 DATA



Slide courtesy of Lindsay Daniels, PharmD, UNC Medical Center

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“HOMEWORK”

- Come to session #4 prepared to share an example from your institution where you used reported data to make a change in the antimicrobial use process.

- Did you track the effects of the change? If so, what were the effects you observed?

THE NORTH CAROLINA CLINICAL ANTIBIOTIC STEWARDSHIP PARTNERS (NC CLASP)

- All the information from today's session will be on our website https://spice.unc.edu/ncclasp/