Antimicrobial resistance is a major concern facing healthcare. The National Healthcare Safety Network (NHSN), from CDC, is a free database for hospitals to use for surveillance and submission of their antimicrobial use and resistance (AUR) data. Submission of AUR data is an option to attest to CMS Meaningful Use Stage 3, however, upload of AUR data to NHSN has been difficult. Through a cooperative agreement from CDC, funding was available to create an electronic integrated system to automate the pull and upload of AUR data from hospital to NHSN.

The Epidemiology and Laboratory Capacity Cooperative Agreement from CDC provides funding to the Healthcare-Associated Infections and Antimicrobial Resistance (HAI/AR) Program at the Kansas Department of Health and Environment for antimicrobial stewardship efforts in the state. Using these funds, the HAI/AR Program had a cloud-based integration platform developed that can directly link to a hospital's electronic health record (EHR) system. This automatically pulls AUR data nightly and submits the data to NHSN. This is done in three steps. First data is acquired, either by receiving it as part of the data feeds provided by the hospital or by querying the system for the required elements. Next, the data is aggregated and consolidated into one dataset. Mapping and logic are applied so only the data needed for the AUR modules will be sent. Finally, the dataset is transmitted, in real time, to the AUR modules. Once this integration is built for a particular EHR system, any hospital in KS using that EHR will be able to utilize it if desired. Use of this integration platform will give the facility and the HAI/AR Program access to their AUR data. This can help target stewardship efforts and evaluate effectiveness of implemented interventions. The HAI/AR Program has a goal to recruit KS hospitals using NHSN to participate in this project we have called the KS Antimicrobial Stewardship Initiative (ASI).

One hospital in Kansas served as the pilot site for the ASI project. The following data elements were requested to be submitted to the NHSN AUR modules: susceptibility, specimen source, pathogen name, location of the patient and visit, patient ID, antimicrobial ordered, and route of administration. The integration was successful and NHSN continues to receive data from the pilot hospital. This was a much faster and less expensive method than has previously been reported by facilities who have begun uploading data to NHSN AUR modules through their EHR vendors. Data extracted can be aggregated to provide meaningful reports to clinicians to support their antimicrobial stewardship program (ASP). Days of therapy and dose per day as well as dispensing units and prescribers can be reported out of the NHSN dataset. Antimicrobial class, redundancy in therapy, de-escalation, and escalation are necessary data points for the hospital to evaluate opportunities for education and ASP improvement. Reports such as these are available through participation in the ASI.

Antimicrobial resistance is a major reason for longer hospital stays, multiple readmissions, and patient deaths. The NHSN AUR modules allow for aggregation and centralization of data from hospitals. A cloud-based integration platform can successfully be used to query a facility’s EHR for required data, and to transmit the data to NHSN daily. Data transmitted can be used by the hospital to guide and evaluate the efforts of their ASP. The HAI/AR Program will aggregate this data to evaluate antimicrobial resistance and usage patterns throughout the state allowing for a more targeted approach in assisting and guiding stewardship in KS.
**Conclusion**

Successful integration & data transmission from one KS hospital that served as a pilot site for the KS (ASI)!

ASP reports available from cloud-based reporting platform – target antimicrobial stewardship (AS) efforts & evaluate effectiveness of implemented interventions

KDHE HAI/AR Program able to access data - assist facilities statewide

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**Antimicrobial Stewardship**

- Access & use of antimicrobial use & resistance (AUR) data allows antimicrobial stewardship programs (ASPs) to assess use of antimicrobials in their facility & to evaluate interventions to improve that use, but many ASPs do not have easy access to this data.
- Centers for Disease Control & Prevention (CDC) recommends surveillance & submission of AUR data by healthcare facilities.
- CDC’s National Healthcare Safety Network (NHSN) has new modules to hold & track AUR data.

**Solution**

- KDHE’s Healthcare-Associated Infections & Antimicrobial Resistance (HAI/AR) Program funded the development of a cloud-based integration platform (CDC Epidemiology & Laboratory Capacity Agreement).
- AUR data pulls directly from facility’s electronic health record (EHR), submits to NHSN, creates reports in cloud-based system.
- Easy access to AUR data by the facility, KDHE, and CDC (aggregate data for latter two).

**Future Plans**

- Expand ASI by integrating with more EHRs.
- Explore partnership with Health Information Exchanges (HIEs).
- Recruit Kansas hospitals to participate in the ASI.
- HAI/AR Program will aggregate AUR data, assess for patterns, target assistance & guidance for AS in KS.

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**Antibiotic Start Report**

The number of antibiotic starts ranked by provider. These can be further stratified per agent, class, spectrum, route, and location.

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**De-escalation & Escalation Reports**

De-escalation report: review for appropriate narrowing of antibiotic therapy through the discontinuation of agents or switching to more selective agents. Appropriate de-escalation may decrease mortality, length of stay, costs, adverse events, and the emergence of multidrug-resistant pathogens.

Escalation report: shows broadening of therapy by adding agents or increasing the spectrum of coverage after the initial therapy. These instances need to be assessed for appropriateness. Inappropriate initial antibiotic therapy is associated with higher mortality, longer hospital stays and increased healthcare costs.

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**Pilot site EHR was Meditech – now any facility using this version of Meditech can join the KS Antimicrobial Stewardship Initiative (ASI)!”**
Kansas Antimicrobial Stewardship Initiative (ASI): a novel way to collect antimicrobial use and resistance data
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Disclosures: Authors of this presentation have the following to disclose concerning possible financial or personal relationship with commercial entities that may have a direct or indirect interest in the subject matter of this presentation: Neil Ratcliff, Bradley Killough and Robyn Regan are employees of PipelineRx.

Poster Acronyms

Antibiotic = a type of antimicrobial agent made from a mold or bacterium that kills or slows the growth of other bacteria. Examples include penicillin and streptomycin.

Antimicrobial = a general term for the drugs, chemicals, or other substances that either kill, inactivate, or slow the growth of microbes including bacteria, viruses, fungi, and parasites.

AR = Antimicrobial Resistance = the result of microbes changing in ways that reduce or eliminate the effectiveness of drugs, chemicals, or other agents to cure or prevent infections.

AS = Antimicrobial Stewardship = the effort to measure and improve how antibiotics are prescribed by clinicians and used by patients.

ASP = Antimicrobial Stewardship Program = program within a healthcare facility that will carryout AS efforts.

AU = Antimicrobial Use = the act of prescribing and/or taking an antimicrobial drug.

AUR = Antimicrobial Use and Resistance

CDC = Centers for Disease Control and Prevention = the national health protection agency for the United States.

EHR = electronic health record (also known as electronic medical record or EMR) = an electronic version of a patients medical history that is maintained by the provider over time.

ELC = Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases = a cooperative agreement opportunity with CDC that provides funds to health departments for work to reduce illness and related deaths caused by a wide range of infectious diseases through surveillance, detection, response, and prevention, plus strategic direction and technical assistance.

HAI = healthcare-associated infections = infections resulting from healthcare received such as from invasive devices and procedures.

HAI/AR = Healthcare-Associated Infections and Antimicrobial Resistance = a program created through ELC funding that is housed within the health department of each state, some large cities, and US territories.

KDHE = Kansas Department of Health and Environment = the state health department in KS.

KS ASI = Kansas Antimicrobial Stewardship Initiative = cloud-based integration of multiple EHR systems to a central hub maintained by the KDHE HAI/AR Program that connects facility AUR data to NHSN’s AUR modules as well as creates reports of these data usable by the individual facility.

NHSN = National Healthcare Safety Network = the nation’s most widely used database and tracking system developed for healthcare-associated infections, free to healthcare facilities, created by CDC.
Contact us for more information

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