



# State of the State HAI/AR Update with a SSI Focus

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# Objectives

- Analysis trends in surgical site infections in Nebraska.
- Review current recommendations for surgical site prevention practices.
- Discuss upcoming and ongoing projects focused on strengthening IPC in healthcare facilities and decreasing surgical site infection rates.

# Disclosure

- Dr. Ashraf
  - Merck & Co. Inc – Principal Investigator for an investigator-initiated research grant focused on training consultant pharmacist in antibiotic stewardship implementation in LTCF
  
- Lacey Pavlovsky
  - No Disclosures

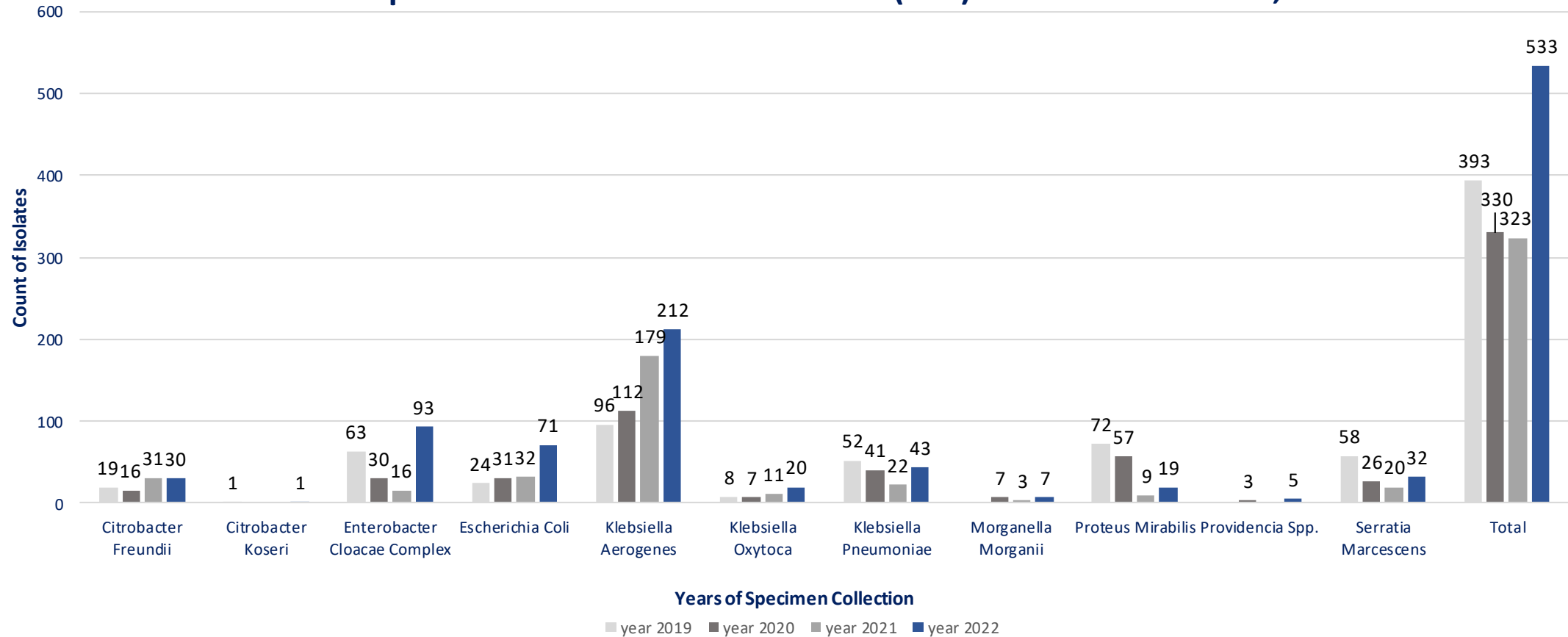


**Recommendations  
were provided based  
on information known  
on 9.15.2023 and may  
become out of date.**

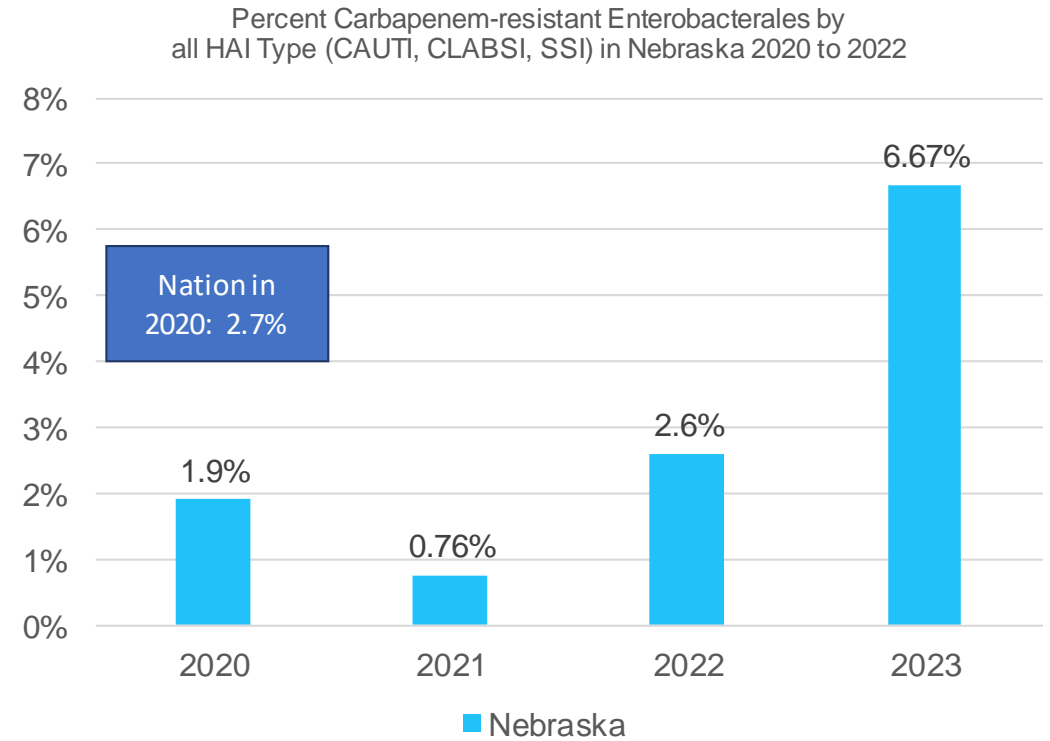
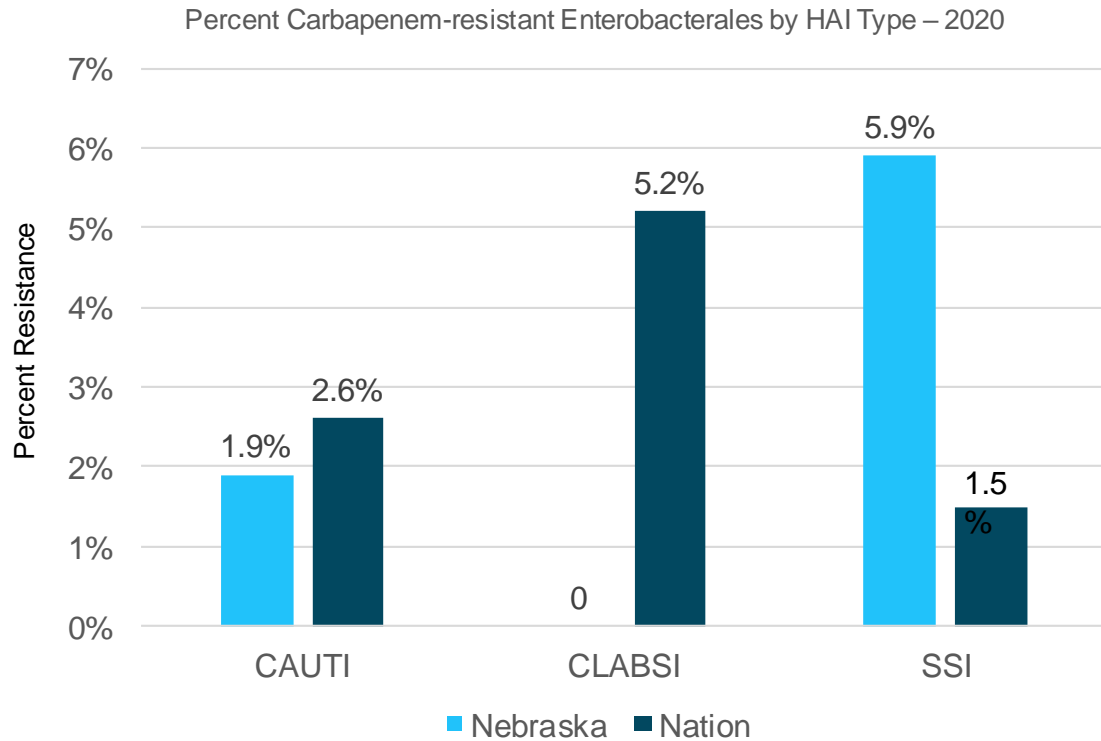
# HAI/AR Data Update

# Carbapenem-Resistant Enterobacterales in Nebraska

## Carbapenem-resistant Enterobacterales (CRE) Isolates in Nebraska, 2019-2022



# CRE Trends Related to HAIs



Source: NHSN Data

# Carbapenemase Genes Identified in Enterobacterales Isolates, Nebraska 2019-2023

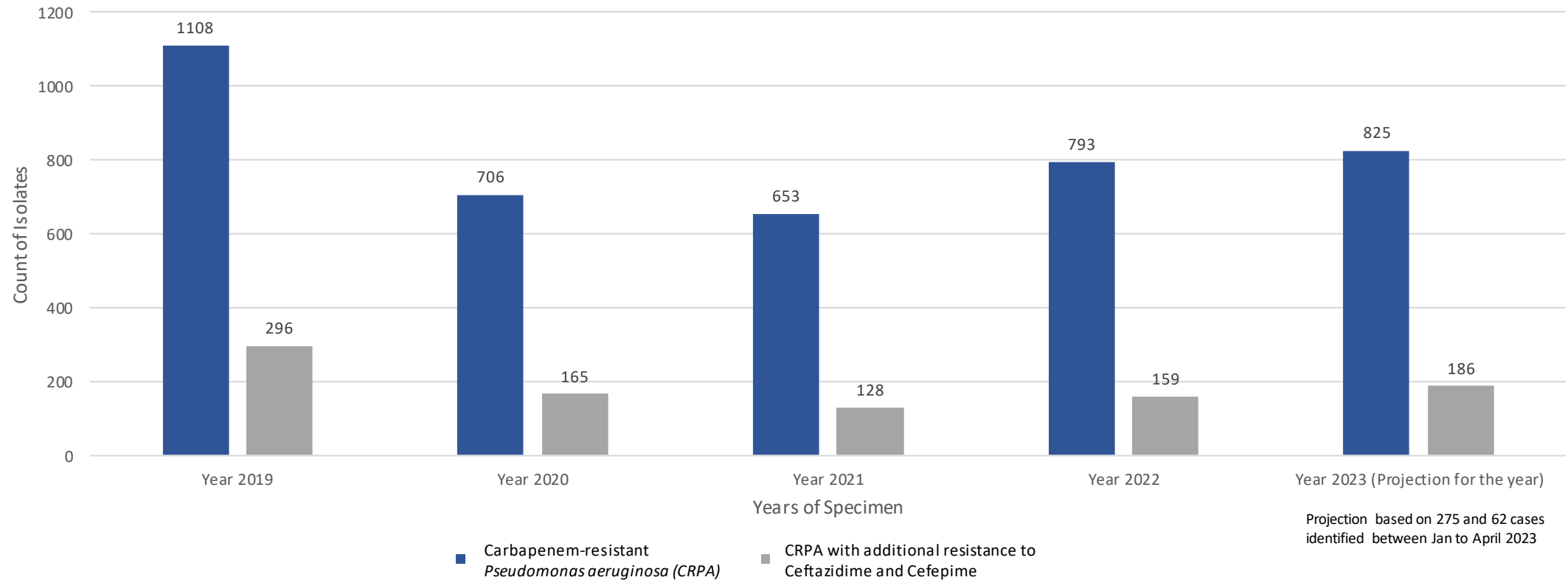
Year	KPC	NDM	VIM	OXA-48	OXA- (Other than 48)	Total
2019	18	9	0	0	3	30
2020	8	0	0	1	0	9
2021	3	0	0	1	0	4
2022	8	3	1	1	0	13
2023 to date	5	4	0	4	0	13

In 2023, 1 case each of Carbapenemase producing *Pseudomonas aeruginosa*, and *Acinetobacter Baumannii* has also been isolated

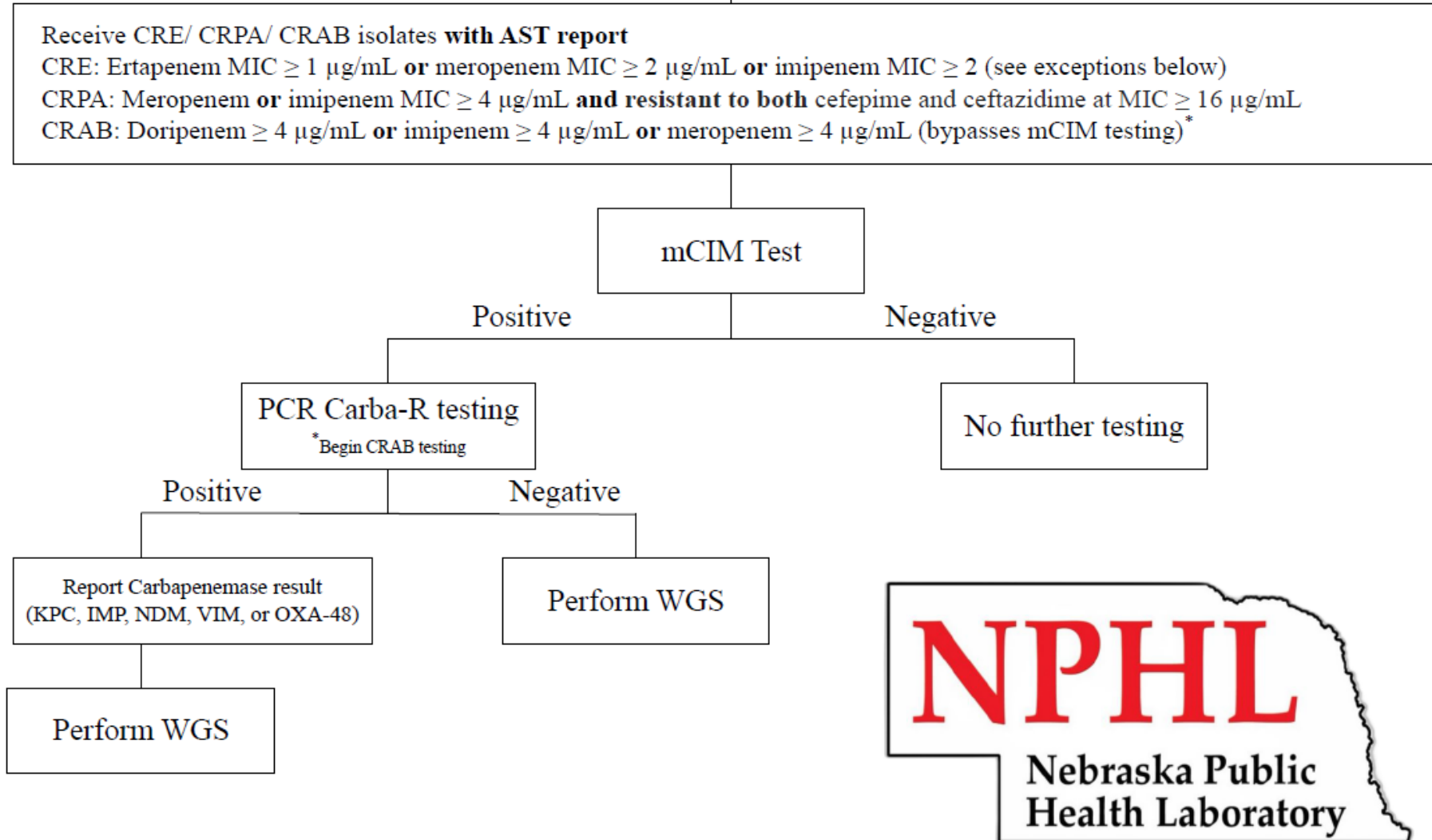


# Carbapenem-Resistant Pseudomonas Aeruginosa

## Carbapenem-Resistant Pseudomonas Aeruginosa (CRPA) isolates in Nebraska, 2019-2022



# NPHL CRE/ CRPA/ CRAB Testing Algorithm



Exceptions:

Do not submit the following isolates:

- *Proteus species*, *Providencia species*, or *Morganella morganii* non-susceptible to imipenem but susceptible to meropenem and ertapenem
- *Pseudomonas aeruginosa* that are mucoid, from a cystic fibrosis patient, or susceptible to cephalosporins

# Updated Guidance for Prevention and Response to MDROs

## Strategies for Prevention and Response to Novel & Targeted Multidrug-Resistant Organisms (MDROs)

[Print](#)

### Overview

Multidrug-resistant organisms (MDROs) are continuing to develop and spread in healthcare settings throughout the United States. Because of this, efforts to prevent MDRO transmission are still needed. In the past, MDROs were identified after lab confirmation, however, research has found that these organisms can spread long before being detected. A prevention approach that incorporates multiple healthcare facilities can potentially limit spread more effectively than response strategies alone.

CDC has developed two guides and FAQs for healthcare facilities, state, local, and territorial health departments to limit the spread of novel or targeted (e.g., *Candida auris*, carbapenemase-producing CRE) MDROs, FAQs, and a graphic (Figure 1) showing the relationship between prevention and response activities.

### On This Page

[Comparison of Strategies](#)

[FAQs](#)

[Lab Resources](#)

[Investigation Guides](#)

[Colonization Screenings](#)

[Inter-facility Transfer Forms](#)

[MRDO Resources](#)



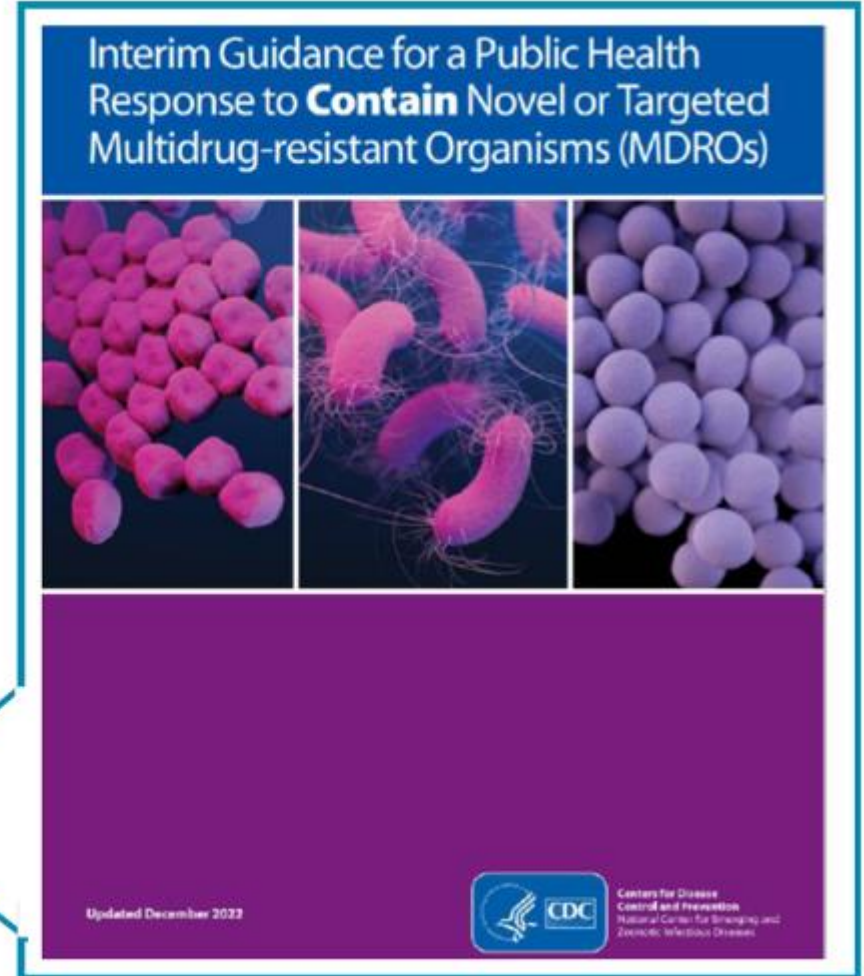
### Prevention Strategies

To prevent the spread of novel and targeted MDROs across healthcare facilities



### Containment Strategy

To address the initial response to novel and targeted MDROs



<https://www.cdc.gov/hai/mdro-guides/index.html>

# Tier Definitions and Examples

Tier	Definition of Included Organisms and Mechanisms	Examples (not all inclusive) of organisms/mechanisms for Nebraska
Tier 1	Never (or very rarely) been identified in the United States and for which experience is extremely limited	Novel Carbapenamases
Tier 2	<ol style="list-style-type: none"> <li>1. Primarily associated with healthcare settings and are not commonly identified in the region (i.e., not been previously identified in the region or have been limited to sporadic cases or small outbreaks), corresponding to “not detected” or “limited to moderate spread” epidemiologic stages.</li> <li>2. No current treatment options exist (pan-not susceptible) and potential to spread more widely</li> </ol>	<i>C. auris</i> Carbapenamases (e.g. KPC, NDM, OXA-48, VIM, IMP) <ul style="list-style-type: none"> <li>• Enterobacterales</li> <li>• Pseudomonas aeruginosa</li> <li>• Acinetobacter baumannii</li> </ul>
Tier 3	Include MDROs targeted by the facility or region for epidemiologic importance that have been identified frequently across a region, indicating advanced spread, but are not considered endemic	TBD Considering ESBL+ organism
Tier 4	Endemic in a region and have been targeted by public health for their clinical significance and potential to spread rapidly	MRSA, VRE

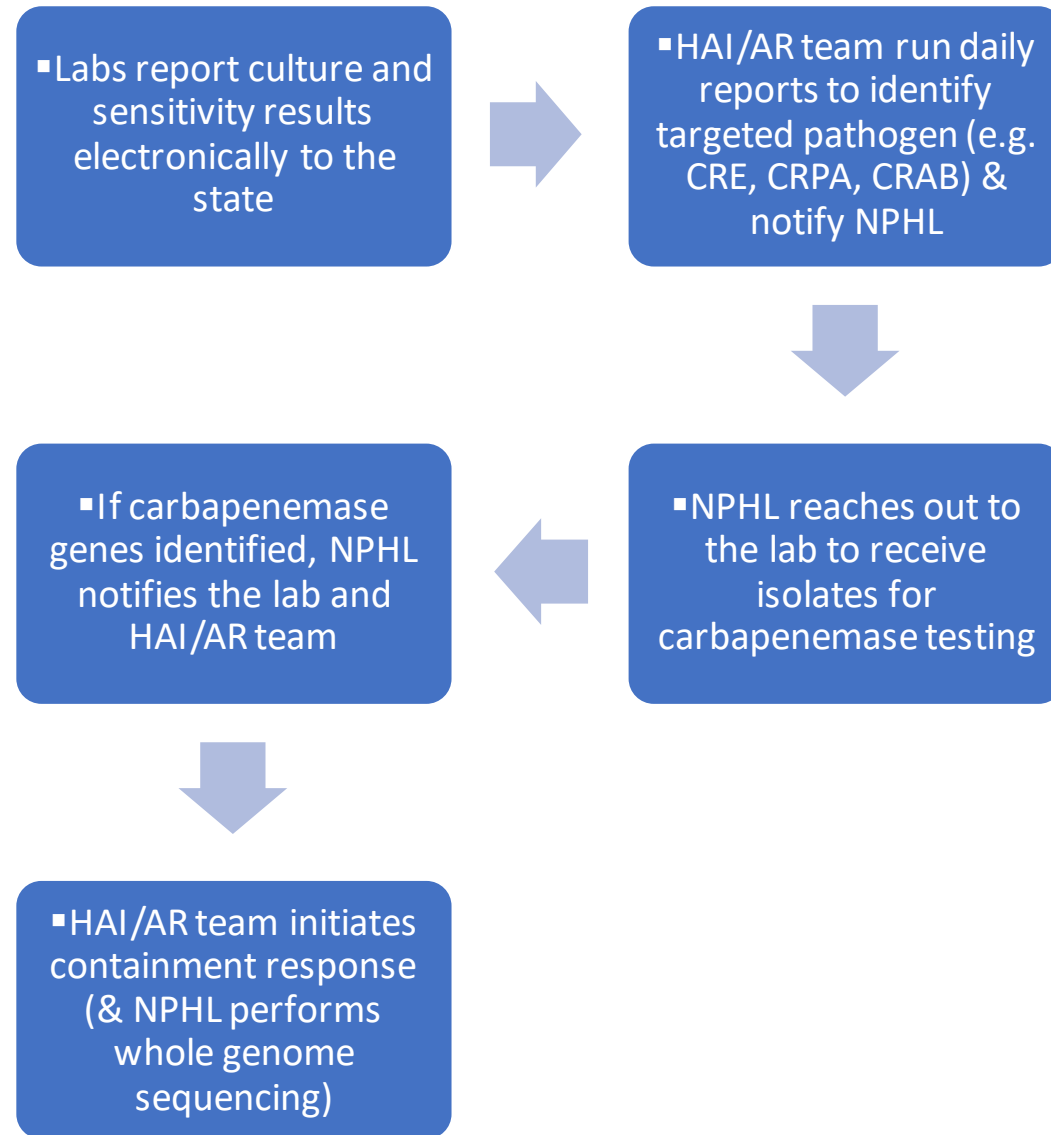
# Containment Response Elements Upon Identification of Targeted MDROs

## Response Elements

Elements	Tier 1	Tier 2	Tier 3	Tier 4
<b>Healthcare Investigation<sup>1</sup></b>				
<b>Review the patient's healthcare exposures prior to and after the positive culture<sup>1</sup></b>	ALWAYS Typical review period: 30 days prior to culture collection to present	ALWAYS Typical review period: 30 days prior to culture collection to present	ALWAYS Typical review period: Current admission and sometimes immediately prior admission	<b>Prioritize prevention;</b> containment principles generally do not apply.
<b>Contact Investigation<sup>1</sup></b>				
<b>Screening of healthcare contacts (i.e., residents and patients)<sup>2</sup></b>	ALWAYS	ALWAYS	USUALLY	<b>Prioritize prevention;</b> containment principles generally do not apply.
<b>Household contact screening</b>	USUALLY	RARELY	RARELY	
<b>Healthcare personnel screening</b>	USUALLY	RARELY	RARELY	
<b>Additional Actions if Transmission Identified in Healthcare</b>				
<b>Recurring response-driven point prevalence surveys<sup>3</sup></b>	ALWAYS	ALWAYS	RARELY	<b>Prioritize prevention;</b> containment principles generally do not apply.
<b>Evaluate potential spread to healthcare facilities that regularly share patients with the index healthcare facility<sup>4</sup></b>	USUALLY	USUALLY	RARELY	

Elements	Tier 1	Tier 2	Tier 3	Tier 4
<b>Clinical Laboratory Surveillance</b>				
<b>Retrospective lab surveillance<sup>6</sup></b>	ALWAYS	ALWAYS	RARELY	<b>Prioritize prevention;</b> containment principles generally do not apply.
<b>Prospective lab surveillance<sup>5</sup></b>	ALWAYS	ALWAYS	ALWAYS	
<b>Environmental Cultures</b>				
<b>Environmental sampling</b>	SOMETIMES	RARELY	RARELY	<b>Prioritize prevention;</b> containment principles generally do not apply.
<b>Infection Control Measures</b>				
<b>Notify healthcare providers; promptly implement appropriate transmission-based precautions</b>	ALWAYS	ALWAYS	ALWAYS	<b>Prioritize prevention;</b> containment principles generally do not apply.
<b>Infection control assessment with observations of practice</b>	ALWAYS	ALWAYS	SOMETIMES	
<b>Clear communication of patient status with transferring facilities</b>	ALWAYS	ALWAYS	ALWAYS	

# Nebraska DHHS Surveillance and Containment Response for Targeted MDRO



- Reports run on working days.
- Weekend or holiday labs are included on the next business day report.
- Facilities can also alert HAI/AR team about a targeted pathogen through alert tool on the [website](#)
- Labs are made aware of the criteria for isolates requiring additional testing for carbapenemase.
- Labs are requested to send NPHL those isolates right away (which takes away the need for NPHL reaching out to them and ensure that specimen will not be lost due to the delay)
- Some labs perform their own carbapenemase testing but still need to send isolates to NPHL for whole genome sequencing, if genes are identified.

# Notification to Facilities for Targeted MDROs

## Initial Notification

- Upon Identification of targeted MDRO (such as any CPO), HAI/AR team notify all facilities that patient have previously visited so the chart can be flagged.

## Adding an Alert

- HAI/AR team adds an infectious diseases alert into the CyncHealth, which also generate notification for HAI/AR team when the patient gets admitted to hospital, visit ED or get discharged

## Prospective Monitoring

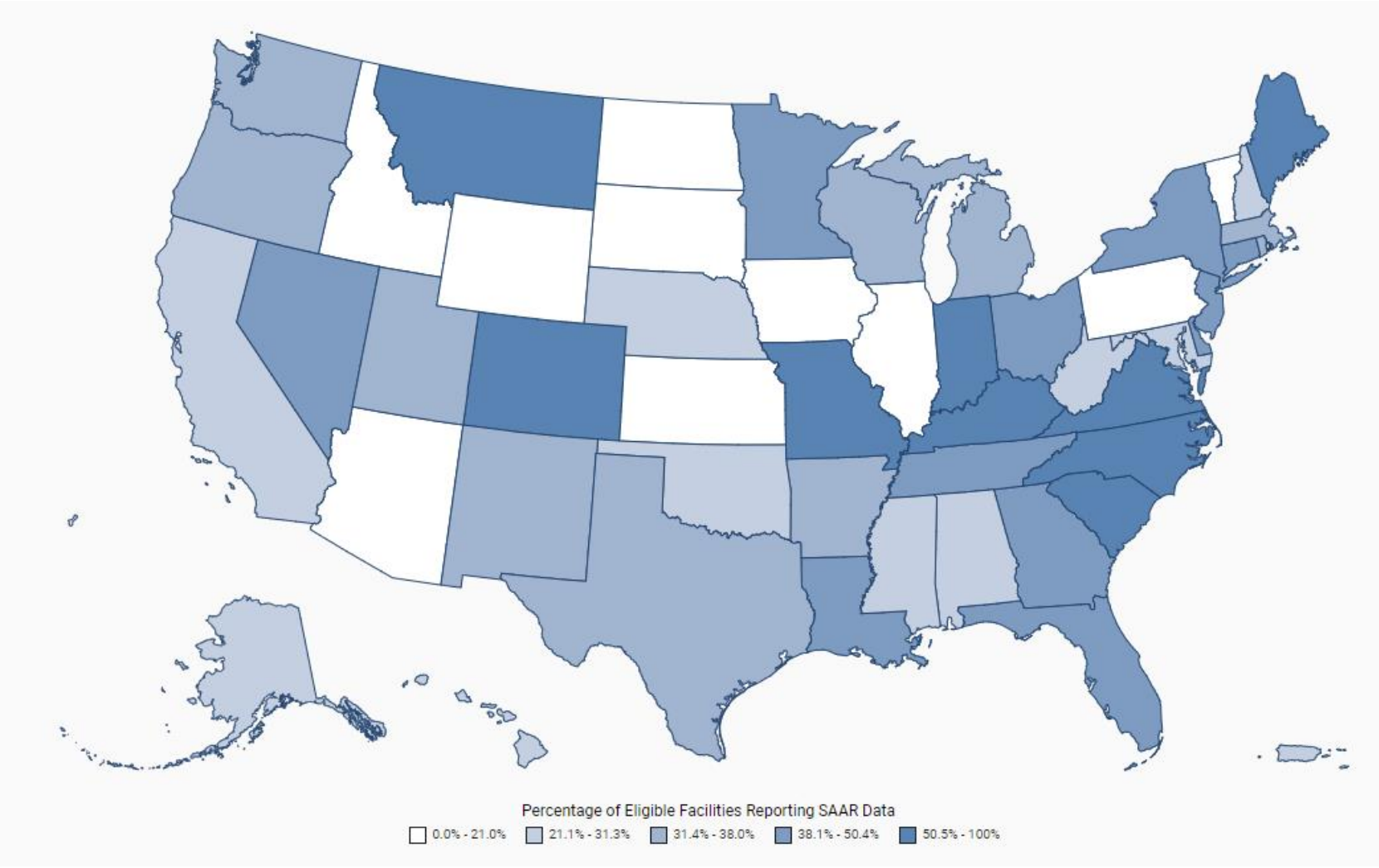
- Upon receiving new admission/visit alert, HAI/AR team reaches out to the IP at the facility to make sure they have received the notification and proper precautions are being taken

## What We Want to Do Next

- Set up a process which allows for an automatic notification to the IP (or other designated staff) upon admission to a facility
- Add a flag to the Clinical Portal of CyncHealth for anyone taking care of the patient to be able to review it
- Explore possibility of adding the information to PDMP so information is available to outpatient clinicians too.

# NHSN Antibiotic Use Module

Percentage of active NHSN acute care facilities reporting at least one month of data to the AU Option as of 2021



**Nebraska:**  
Number of facilities reporting: 13  
Number of facilities eligible to report SAARs: 54  
Percentage: 24.1%



# Benefits of AUR Reporting

## Insights and Data Benefits

- Benchmarks for antimicrobial stewardship
- Benchmarks for antimicrobial quality improvement activities
- Compare with antimicrobial use trends across the nation (SAAR)
- Identify problem areas within a facility to target interventions
- Antibiotic Stewardship guidance from Nebraska ASAP

## Regulatory and Payment Benefits

- Meet the CMS Promoting Interoperability requirement added for CY 2024
- Satisfy the Joint Commission's antimicrobial stewardship standard for tracking and reporting
- Added to the CDC Priorities for Hospital Antibiotic Stewardship Core Element Implementation in 2022
  - [Priorities for Hospital Core Element Implementation | Antibiotic Use | CDC](#)

### Hospital Core Elements



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

### Priorities for Hospital Core Element Implementation

Hospital submits antibiotic use data to the NHSN Antimicrobial Use Option.

# NHSN AUR Implementation in Nebraska – Funding Assistance

- **Nebraska DHHS HAI/AR program has made funding available to dedicate towards assisting hospitals with implementing NHSN AUR module**
- Funding distributed by **reimbursing** at least part of their expenses for program implementation incurred **between February 2022 – July 2024**
- Facilities meeting all requirements for funding may request reimbursement for related eligible expenses up to the maximum amount allowed for their facility based on licensed bed size as follows:
  - Facilities with <100 licensed beds can request a maximum of \$10,000 in reimbursement
  - Facilities with 101-200 licensed beds can request a maximum of \$15,000 in reimbursement
  - Facilities with ≥201 licensed beds can request a maximum of \$20,000 in reimbursement

**Nebraska National Healthcare Safety Network Antibiotic Use and Resistance (NHSN AUR) Module Support Project - Expenses Reimbursement Requirements**

**NEBRASKA**  
Good Life. Great Mission.  
DEPT. OF HEALTH AND HUMAN SERVICES

***Purpose:*** The purpose of this application is to reimburse expenses associated with implementation of reporting data to the National Healthcare Safety Network (NHSN) Antibiotic Use (AU) and/or Antibiotic Resistance (AR) modules to Nebraska hospitals. Individual staff are not eligible for reimbursement.

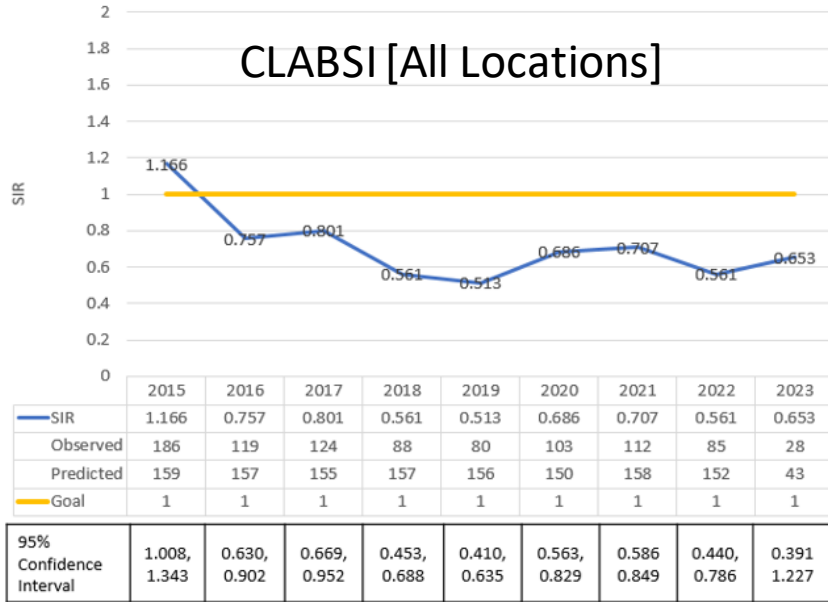
***Who is eligible for reimbursement?***

Licensed acute care inpatient facilities in Nebraska are eligible if the following criteria are met:

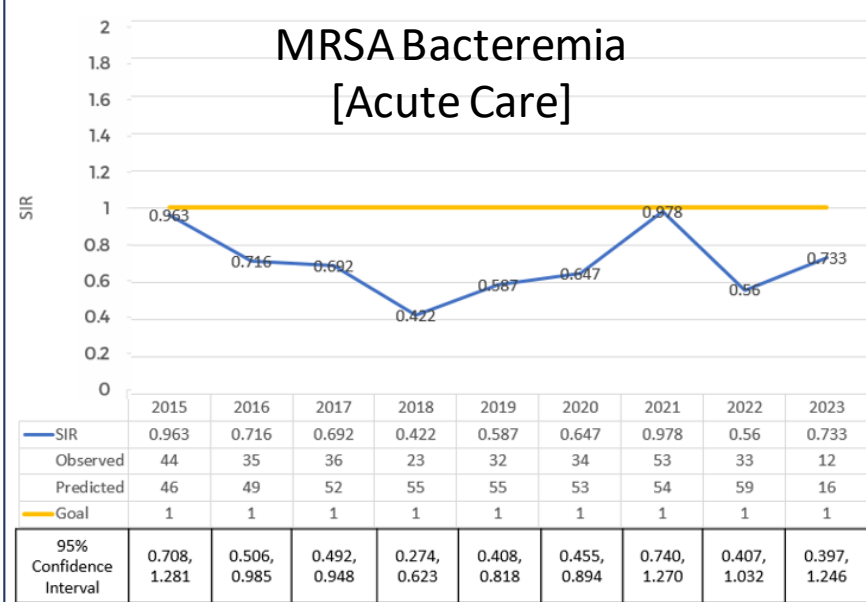
1. The facility must be enrolled in NHSN and eligible to report to the NHSN Patient Safety Component AUR Module as defined by NHSN below.
  - a. Inpatient facilities eligible to report to the NHSN Patient Safety Component AUR Module include facilities enrolled as general hospitals, critical access hospitals, children’s hospitals, long term acute care hospitals, pediatric long term acute care hospitals, military and veterans’ hospitals, oncology hospitals, orthopedic hospitals, psychiatric hospitals, rehabilitation hospitals, surgical hospitals, women’s hospitals, women’s and children’s hospitals, government and non-government hospitals for public health emergencies.

# Healthcare-Associated Infections – Nebraska 2015-2023

## CLABSI [All Locations]

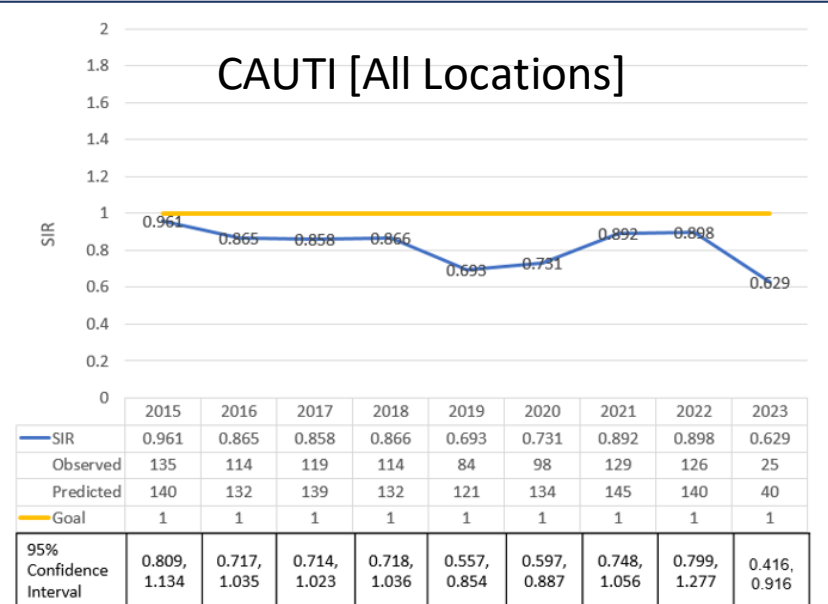


## MRSA Bacteremia [Acute Care]

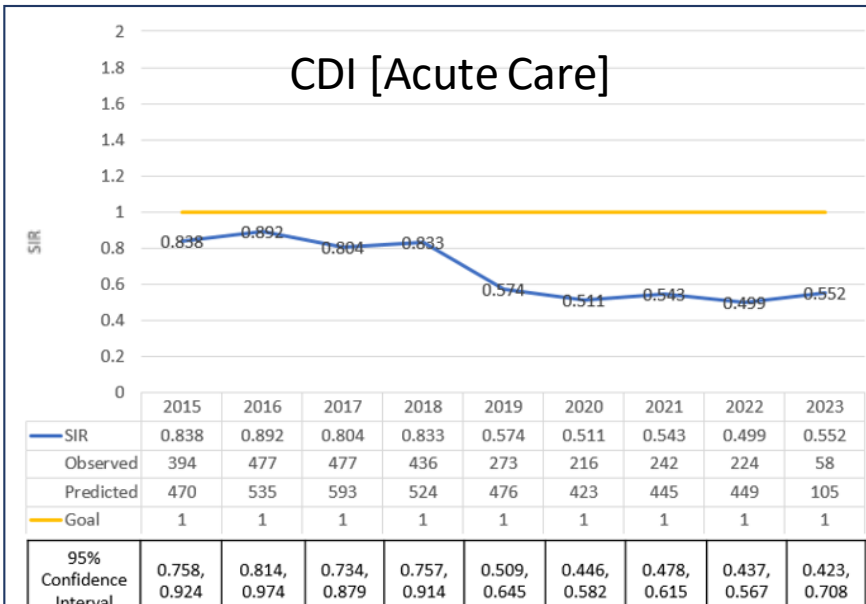


**\*2023 Data is for January 2023-April 2023**

## CAUTI [All Locations]



## CDI [Acute Care]

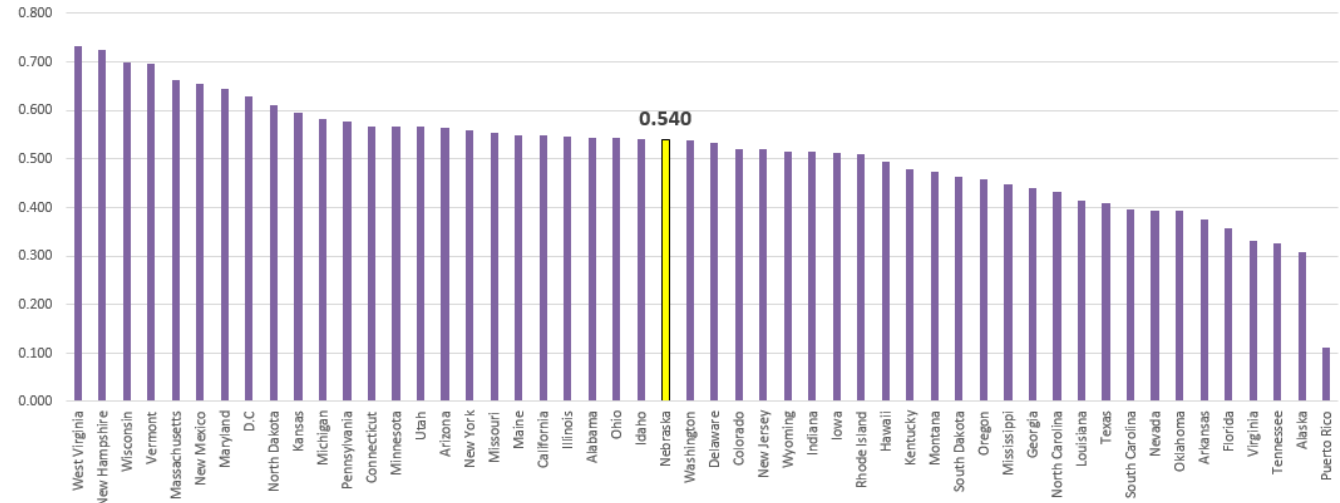


Data Source: NHSN – Include acute care hospitals conferring rights to DHHS

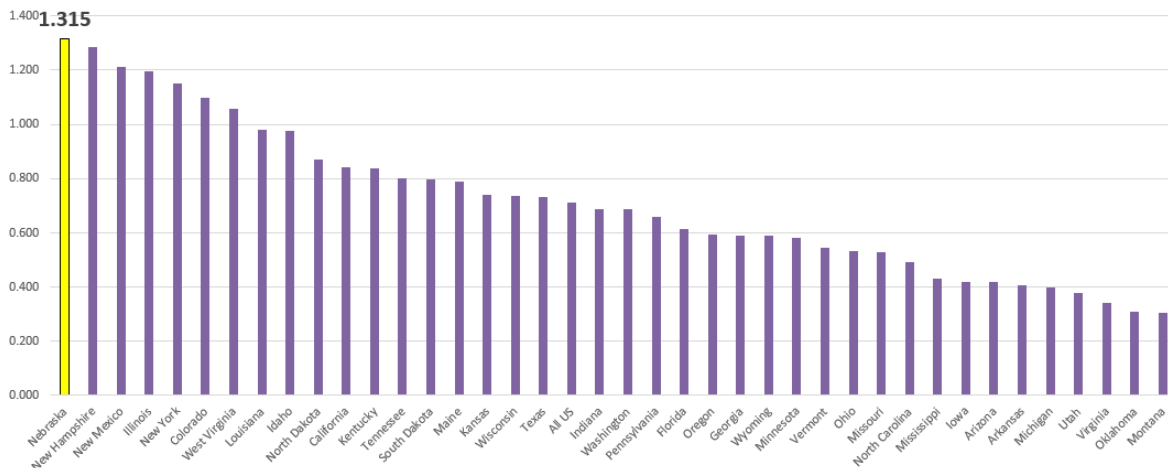
# Digging Deeper into Hospital- Onset *C. difficile* Infections

Nebraska acute care hospitals (excluding critical access hospitals) **ranked 26<sup>th</sup> for lowest SIR** for *C. difficile* Infections among all 50 states in the US in 2021 (with 28 facilities contributing to this report)

NHSN Acute Care Hospitals reporting during 2021  
Hospital-onset Clostridioides difficile (CDI), facility-wide



NHSN Critical Access Hospitals reporting during 2021  
Hospital-onset Clostridioides difficile (CDI), facility-wide



Nebraska critical access hospitals have **the highest SIR** for *C. difficile* Infections among all 50 states in the US in 2021 (with 36 facilities contributing to this report)

## C. Difficile Best Practices: Testing to Containment to Treatment

Webinar Series



C. diff education  
Sept-Oct 2023  
– Register Here!

### Program Overview

The Nebraska Hospital Association in partnership with ICAP / ASAP / DHHS will be hosting a 5-part webinar series focused on C. Difficile best practice. Experts in the field will review best practices in the infection prevention ecosystem for testing, containment, and treatment of C. Difficile infections in both urban system hospitals, as well as rural and Critical Access Hospitals.

### Target Audience

C-Suite; Quality Leaders/Staff; Nursing Leaders/Staff; Pharmacy Leaders/Staff; Infection Preventionists; Providers; Laboratory; Information Technology/Clinical Informaticist

### Cost

No cost is associated with this program.

#### Session #1 – CDI Testing

September 26, 2023, 12:00 - 1:00 PM CT

##### Objectives:

- Identify different testing strategies – advantages and disadvantages.
- Analyze signs and symptoms of CDI.
- Understand patient risk factors for CDI and exposure.

**Speakers:** Dr. Van Schooneveld/Dr. Teran (ASAP/ICAP Medical Directors)

#### Session #2 – CDI Audit and Feedback Processes in Infection Prevention

October 10, 2023, 12:00 - 1:00 PM CT

##### Objectives:

- Understand CDI infection prevention best practices.
- Discuss auditing CDI and reporting practices in hospital.
- Analyze staff education and feedback regarding CDI practices.

**Speakers:** Rebecca Martinez BA, BSN, RN, CIC (ICAP Infection Preventionist)

#### Session #3 – Strategies to Improve Environmental Cleaning

October 24, 2023, 12:00 - 1:00 PM CT

##### Objectives:

- Understand appropriate cleaning products for CDI infections.
- Address high-touch surfaces cleaning.
- Discuss terminal cleaning practices.
- Identify cleaning audit tools.

**Speakers:** Jody Scebold/Kate Tyner (ICAP Infection Preventionists)

#### Session #4 – High Risk CDI Medications

October 31, 2023, 12:00 - 1:00 PM CT

##### Objectives:

- Discuss antibiotic therapy risk stratification for CDI.
- Assess antimicrobial stewardship interventions related to decreasing C. diff.
- Evaluate gastric acid suppression and implications for CDI risk.

**Speakers:** Jenna Preusker, PharmD, BCPS, BCIDP (ASAP Pharmacist)

#### Session #5 – Management of CDI

November 16, 2023, 12:00 - 1:00 PM CT

##### Objectives:

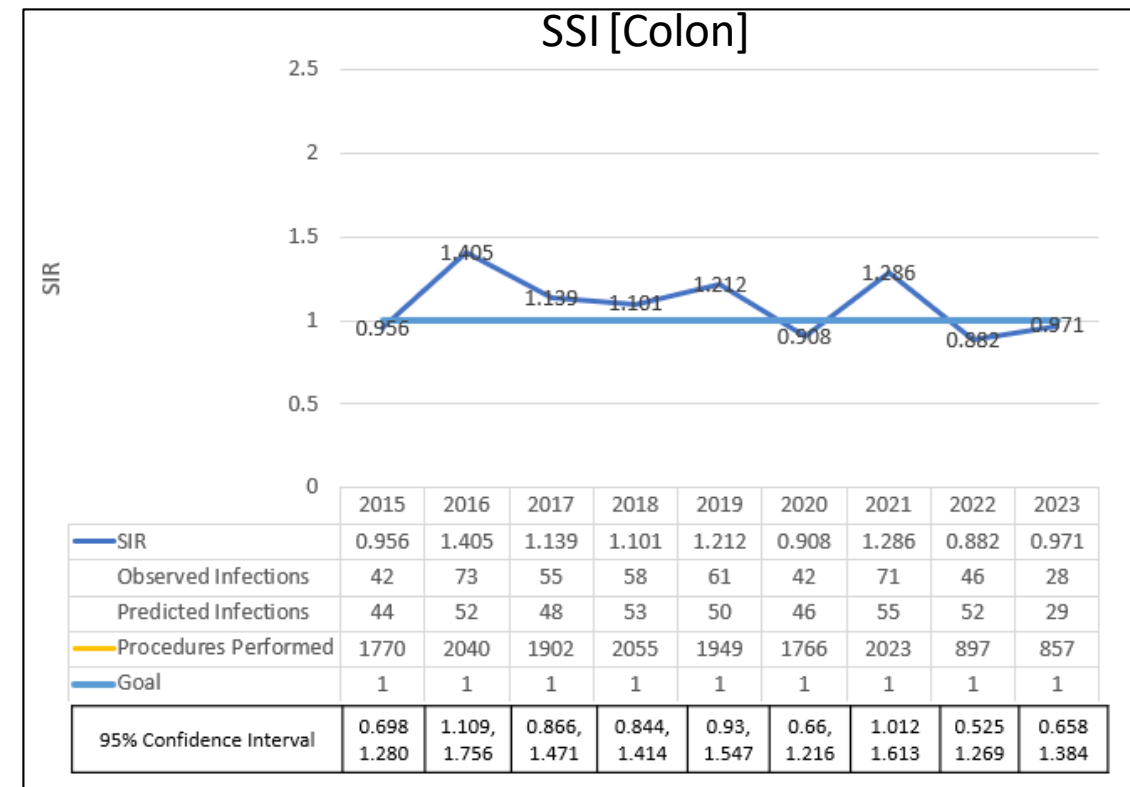
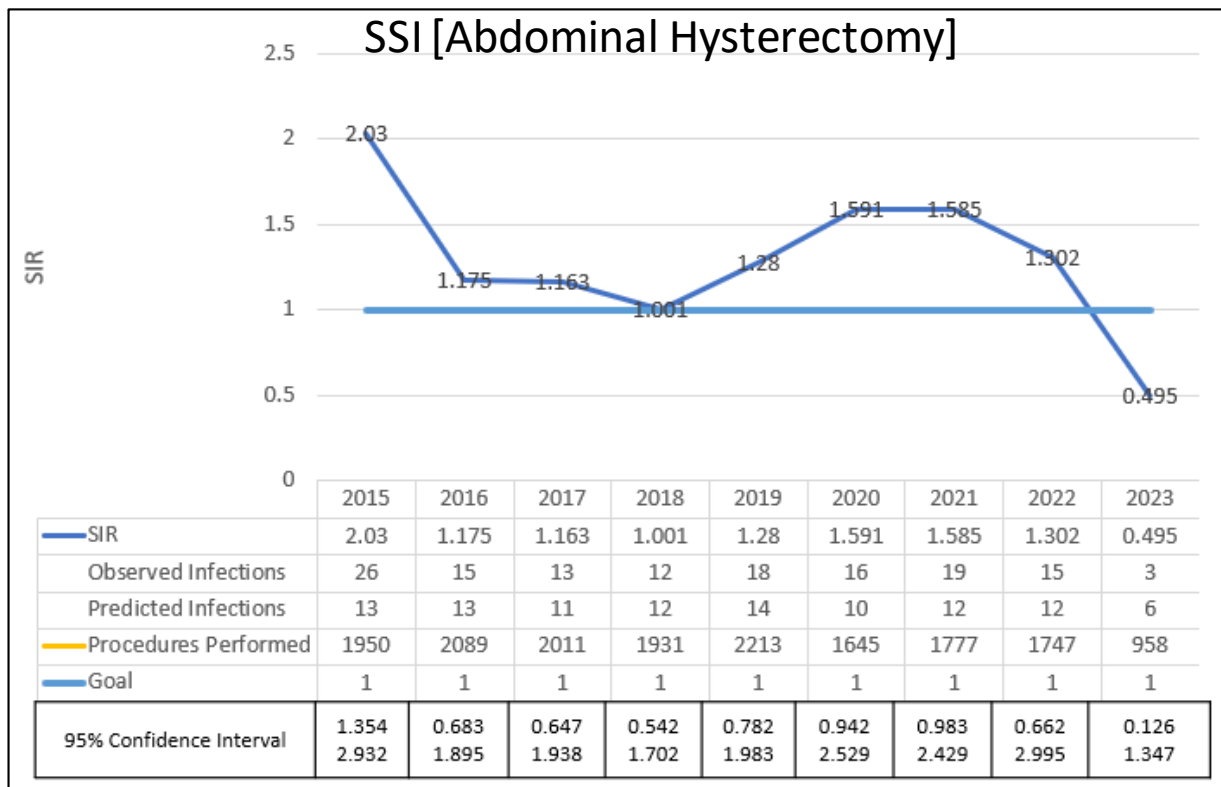
- Discuss best practices in management of CDI.
- Understand the treatment of initial and recurrent infections.
- Determination of severity of illness.

**Speakers:** Danny Schroeder PharmD, BCPS (ASAP Pharmacist)

### Contacts

For more information, please contact Dana Steiner – [dsteiner@nebraskahospitals.org](mailto:dsteiner@nebraskahospitals.org) or Amber Kavan – [akavan@nebraskahospitals.org](mailto:akavan@nebraskahospitals.org)

# Healthcare-Associated Infections – Nebraska 2015-2023



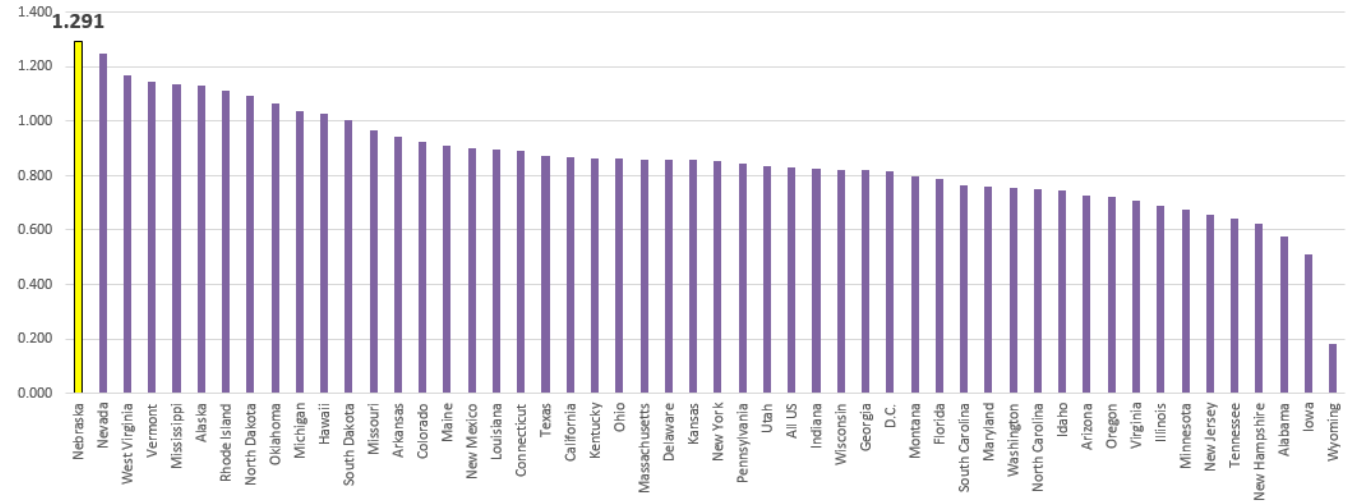
Data Source: NHSN – Include acute care hospitals conferring rights to DHHS

\*2023 Data is from January-July 2023

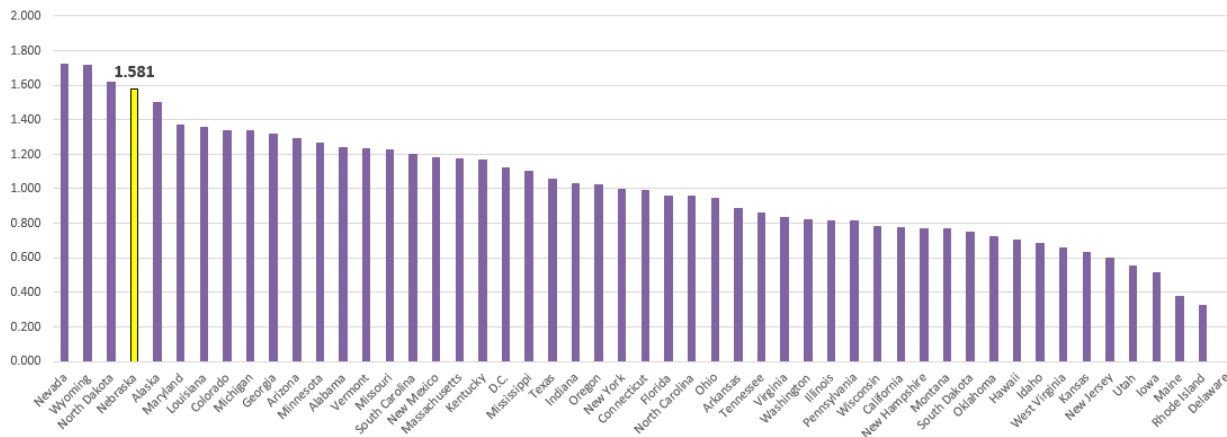
# 2021 SIR Comparison for SSI Among All States

Nebraska has the **highest SIR** for Surgical Site Infections following Colon Surgeries

NHSN Acute Care Hospitals reporting during 2021  
Surgical site infections (SSI) following **colon surgery** in adults, ≥ 18years



NHSN Acute Care Hospitals reporting during 2021  
Surgical site infections (SSI) following **abdominal hysterectomy** surgery in adults, ≥ 18years



Nebraska has the **fourth highest SIR** for Surgical Site Infections following Abdominal Hysterectomies

# 2023 SSI Prevention Practices Survey Results with Best Practice Guidelines and Recommendations



# Current Collaborative Efforts to Decrease SSI's

- Development of SSI subcommittee of HAI/AR Advisory Council
  - Representative of 6 hospitals participating in the subcommittee
  - Includes ID physicians, surgeons, IPs and quality program leaders
- Subcommittee developed and conducted statewide survey of hospitals
  - >50% of hospitals responded to survey
  - Completed in April 2023

**Surgical Site Infection (SSI) Prevention Practices Survey** AAA

**Intro Statement**

On behalf of the Nebraska DHHS HAI/AR Advisory Council's Surgical Site Infection (SSI) Subcommittee, you are invited to participate in the SSI Prevention Practices survey with a focus on general SSI prevention as well as COLO and HYST procedures.

The survey was developed leveraging recommendations from professional organizations including IDSA, SHEA, ACS, ACOG, ERAS, and AORN. Findings from this survey will be utilized to assess the SSI prevention practices across Nebraska.

The survey and its results will be shared with the NE DHHS HAI/AR Advisory committee and others only in a de-identified format. The survey responses will be used to develop resources and strategies focused on helping hospital infection prevention and control programs in their efforts to decrease SSI within their facilities.

**Directions:**

To accurately complete the survey, the HAI/AR SSI subcommittee recommends collaboration between the facility Infection Preventionist and the OR manager/director/educator. It may also be helpful to include pharmacy, central supply, and other members of your SSI prevention team.

The survey will take approximately 20-30 minutes to complete. However, collecting some of the information for the survey may take additional time. The respondents have the opportunity to save the completed answers and return back to the survey to complete any remaining unanswered questions.

Participation in this survey is strictly voluntary. We are hoping that you will join us in the efforts to decrease SSI rates in the state by completing this survey.

Only one survey completion is requested per facility. **Please have this survey completed by Friday, April 14, 2023.**

Sincerely,

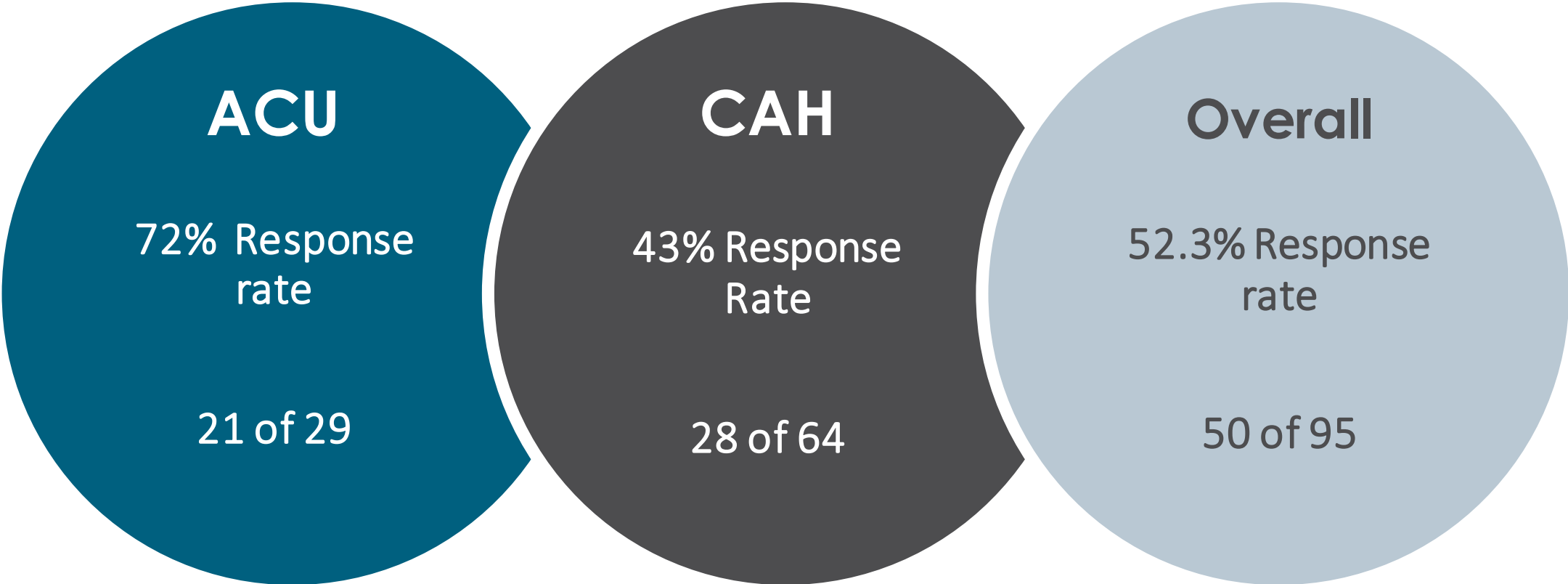
Nebraska DHHS HAI/AR Program and the Nebraska DHHS HAI/AR Advisory Council's SSI Subcommittee

**Facility Demographic Information**

Name(s) and Title(s) of Person/People Completing the Survey

\* must provide value

# Survey Response Rates



# Survey Question Topics

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Facility Demographics

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Auditing Practices

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Fingernails

---

Surgical Attire

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Preoperative Hair Removal

---

Staph Aureus Decolonization

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Surgical Hand Antisepsis

---

Maintaining Normothermia

---

Blood Glucose Control

---

Minimizing OR Traffic

---

Preoperative and Intraoperative Bathing

---

Intraoperative Skin Prep

---

Antimicrobial Prophylaxis

---

Aseptic Technique

---

Operating Room Design

---

Use of Robotics in the Operating Room

---

Incisional Negative Pressure Wound Dressings

# Survey Question Topics- Surgery Type Specific Questions

## Hysterectomy

- Perioperative screening for bacterial vaginosis
- Pre-and Intraoperative Antibiotics
- Vaginal Prep
- Uterine manipulation and glove changes
- Closing a HYST Case

## Caesarean Section (C-Section)

- Vaginal Prep
- Closing a C-Section Case

## Colon Procedure

- Preoperative Mechanical Bowel Preparation (MBP) Regimen
- Pre-and Intraoperative Antibiotics
- Closing a COLO Case



# Areas of Opportunity

# Auditing in the Perioperative Environment

## Fingernails

- Yes -46%
- No-48%
- Unsure-6%

Surgical Attire  
76-90 % Yes  
(multiple questions)

## Surgical Hand Antisepsis

Yes -62%  
No-30%  
Unsure-8%

## Minimizing OR Traffic

Yes -30%  
No-64%  
Unsure-6%

## Intraoperative Skin Prep

Yes -32%  
No-62%  
Unsure-6%

## Aseptic Technique

Yes -46%  
No-48%  
Unsure-6%

## Antimicrobial Prophylaxis For HYST

Yes -26%  
No-24%  
Unsure -50%

## Antimicrobial Prophylaxis For COLO

Yes -40%  
No-24%  
Unsure -26%

# Auditing Recommendations

Reference Source	
<a href="#">SHEA/IDSA/APIC Practice Recommendation Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update</a>	<p>Provide ongoing SSI rate feedback to surgical and perioperative personnel and leadership. (Quality of evidence: MODERATE)</p> <ul style="list-style-type: none"> <li>Routinely audit and provide confidential feedback on SSI rates or SIRs <b>AND</b> adherence to process measures to individual surgeons, the surgical division and/or department chiefs, and hospital leadership</li> </ul> <p>Measure and provide feedback to HCP regarding rates of compliance with process measures (Quality of evidence: LOW)</p> <ul style="list-style-type: none"> <li>Routinely provide feedback to surgical staff, perioperative personnel, and leadership regarding compliance with targeted process measures</li> </ul> <p>Observe and review operating-room personnel and the environment of care in the operating room and in central sterile reprocessing. (Quality of evidence: LOW)</p> <p><b>Perform direct observation audits of operating-room personnel to assess operating-room processes and practices to identify infection control lapses, including but not limited to adherence to process measures</b></p> <ul style="list-style-type: none"> <li>antimicrobial prophylaxis choice</li> <li>timing and duration protocols</li> <li>Hair removal</li> <li>surgical hand antisepsis</li> <li>patient skin preparation,</li> <li>operative technique</li> <li>surgical attire (wearing and/or laundering outside the operating room)</li> <li>level of operating- room traffic.</li> </ul>

# Blood Glucose Control

<b>BLOOD GLUCOSE CONTROL</b>		
	<b>Count</b>	<b>% of Answers (All Responses)</b>
The facility screens all patients for diabetes prior to surgery.		
Yes	31	62.00%
No	15	30.00%
In Progress	4	8.00%
The facility ensures that perioperative patient glycemic controls are in place. This includes maintaining blood glucose target levels that are: (31)		
Less than 200 mg/dL in patients with and without diabetes.	12	38.71%
Values between 110 and 150 mg/dL in patients with and without diabetes.	7	22.58%
Other target range per facility policy.	2	6.45%
Didn't Answer	10	32.26%



# Blood Glucose Control

Reference Source	
<p>ACOG Prevention of infection after gynecologic procedures. (2018). <i>The American College of Obstetricians and Gynecologists</i>, 131(6).</p>	<p>Preoperative diabetes screening can be performed for women at high risk who have not been recently screened Implement perioperative glycemic control and use blood glucose target levels of less than 200 mg/dL in patients with and without diabetes</p>
<p><a href="#">SHEA/IDSA/APIC Practice Recommendation Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update</a></p>	<p>Control blood-glucose level during the immediate postoperative period for all patients. (Quality of evidence: HIGH) Monitor and maintain postoperative blood-glucose level regardless of diabetes status. Maintain postoperative blood-glucose level between 110 and 150 mg/dL. Increased glucose levels during the operational procedure are associated with higher levels in the postoperative setting</p>
<p>JAMA (Journal of the American Medical Association) Surgical Site Infection Prevention A Review (2023)</p>	<p>Maintain and monitor blood glucose levels regardless of diabetes Status. Maintain blood glucose values between 110 and 150 mg/dL</p>
<p>ERAS Guidelines for Perioperative Care in Elective Colorectal Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations: 2018</p>	<p>Hyperglycaemia is a risk factor for complications and should therefore be avoided. Several interventions in the ERAS protocol prevent insulin resistance, thereby improving glycaemic control with no risk of causing hypoglycaemia. For in patients, insulin should be used judiciously to maintain blood glucose as low as feasible with the available resources.</p>
<p>CDC Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017</p>	<p>3A.1. Implement perioperative glycemic control and use blood glucose target levels less than 200 mg/dL in patients with and without diabetes. (Category IA—strong recommendation; high to moderate—quality evidence.) 3A.2. The search did not identify randomized controlled trials that evaluated lower (&lt;200mg/dL) or narrower blood glucose target levels than recommended in this guideline nor the optimal timing, duration, or delivery method of perioperative glycemic control for the prevention of SSI. (No recommendation/unresolved issue.) 3B. The search did not identify randomized controlled trials that evaluated the optimal hemoglobin A1C target levels for the prevention of SSI in patients with and without diabetes. (No recommendation/unresolved issue.)</p>
<p>ACS American College of Surgeons and Surgical Infection Society: Surgical Site Infection Guidelines, 2016 Update</p>	<p>Hyperglycemia in the immediate preoperative period is associated with an increased risk of SSI. Target perioperative blood glucose should be between 110-150 mg/dL in all patients, regardless of diabetic status, except in cardiac surgery patients where the target perioperative blood glucose is &lt;180 mg/dL Target blood glucose rates &lt;110mg/dL have been tied to adverse outcomes.</p>

# Antimicrobial Prophylaxis

ANTIMICROBIAL PROPHYLAXIS		
Antimicrobial Prophylaxis: Please indicate which of the following practices are being followed (Select all that apply)		
Dose is given within 1 hour prior to cut time (unless given vancomycin or fluoroquinolones, which are 2 hours)	45	90.00%
Dosing is weight-based	41	82.00%
Antibiotic prophylaxis is adjusted according to the planned procedure, with the addition of anaerobic coverage in the setting of pelvic cancer surgery or bowel surgery	28	56.00%
Redosing is performed as indicated based on duration of surgical case and blood loss	27	54.00%

# Antimicrobial Prophylaxis

Reference Source	
<p>ACOG Prevention of infection after gynecologic procedures. (2018). <i>The American College of Obstetricians and Gynecologists</i>, 131(6).</p>	<p>Antimicrobial prophylaxis generally is defined as a brief course of an antimicrobial agent initiated within 1 hour before a procedure begins. The use of a weight-based dosage is recommended. For lengthy procedures, additional intraoperative doses of an antibiotic, given at intervals of two times the half-life of the drug measured from the initiation of the preoperative dose, not from the onset of surgery, are recommended to maintain adequate levels throughout the operation In surgical cases with excessive blood loss, a second dose of the prophylactic antibiotic may be appropriate.</p>
<p><a href="#">SHEA/IDSA/APIC Practice Recommendation Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update</a></p>	<p>Administer antimicrobial prophylaxis according to evidence-based standards and guidelines. (Quality of evidence: HIGH) Increase dosing of prophylactic antimicrobial agent for morbidly obese patients. (Quality of evidence: HIGH) Administer only when indicated. Select appropriate agents based on surgical procedure, most common pathogens causing SSI for a specific procedure, and published recommendations. Administer within 1 hour of incision to maximize tissue concentration. Discontinue antimicrobial agents after incisional closure in the operating room Re-dose prophylactic antimicrobial agents for lengthy procedures and in cases with excessive blood loss during the procedure (i.e., &gt;1,500 mL).</p>
<p><a href="#">ERAS Guidelines for Perioperative Care in Elective Colorectal Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations: 2018</a></p>	<p>Intravenous antibiotic prophylaxis should be given within 60 min before incision as a single-dose administration to all patients undergoing colorectal surgery. In addition, in patients receiving oral mechanical bowel preparation, oral antibiotics should be given. No recommendation for the use of oral antibiotic decontamination can be given for patients having no bowel preparation.</p>

# Antimicrobial Prophylaxis continued

Reference Source	
<p><a href="#">CDC Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017</a></p>	<p><b>Parenteral Antimicrobial Prophylaxis</b></p> <p>1A.1. <b>Administer preoperative antimicrobial agents only when indicated based on published clinical practice guidelines</b> and timed such that a bactericidal concentration of the agents is established in the serum and tissues when the incision is made. (Category IB—strong recommendation; accepted practice.)</p> <p>1A.2. No further refinement of timing can be made for preoperative antimicrobial agents based on clinical outcomes. (No recommendation/unresolved issue.)</p> <p>1B. <b>Administer the appropriate parenteral prophylactic antimicrobial agents before skin incision in all cesarean section procedures.</b> (Category IA—strong recommendation; high-quality evidence.)</p> <p>1C. The literature search did not identify randomized controlled trials that evaluated the benefits and harms of weight-adjusted parenteral antimicrobial prophylaxis dosing and its effect on the risk of SSI. (No recommendation/unresolved issue.)</p> <p>1D. The search did not identify sufficient randomized controlled trial evidence to evaluate the benefits and harms of intraoperative redosing of parenteral prophylactic antimicrobial agents for the prevention of SSI. (No recommendation/unresolved issue.)</p> <p>1E. In clean and clean-contaminated procedures, do not administer additional prophylactic antimicrobial agent doses after the surgical incision is closed in the operating room, even in the presence of a drain. (Category IA—strong recommendation; high-quality evidence.)</p>

# HYST Vaginal Prep Practices

	Count	% of Answers (All Responses)
Please indicate vaginal prep/cleansing practices prior to hysterectomies at the facility.		
Vaginal prep/cleansing is done prior per facility policy prior to all hysterectomies.	11	22.00%
Vaginal prep/cleansing is done prior per physician order/preference.	16	32.00%
Vaginal prep/cleansing is not performed prior to hysterectomies.	6	12.00%
Didn't Answer	17	34.00%
For abdominal hysterectomy or (trans) vaginal procedures, the facility utilizes one (or more) of the following vaginal prep/cleansing products (Select all that apply). (27)		
Povidone iodine	15	55.56%
4% chlorhexidine gluconate (CHG)	7	25.93%
Unsure	2	7.41%
Other	3	11.11%

# C-Section Vaginal Prep Practices

	Count	% of Answers (All Responses)
Please indicate vaginal prep/cleansing practices prior to C-sections at the facility.		
Vaginal prep/cleansing is done if the patient is laboring, or the patient's water has broken.	3	6.00%
Vaginal prep/cleansing is done prior per physician order/preference prior to C-sections.	6	12.00%
Vaginal prep/cleansing is done prior per facility policy prior to all C-sections .	5	10.00%
Vaginal prep/cleansing is not performed prior to C-sections.	17	34.00%
Didn't Answer	19	38.00%
For C-section procedures, the facility utilizes one (or more) of the following vaginal prep/cleansing products (Select all that apply). (9)		
Povidone iodine	4	8.00%
4% chlorhexidine gluconate (CHG)	3	6.00%
Other	1	2.00%
Didn't Answer	1	2.00%

# Vaginal Prep Practices

Reference Source	
<p>ACOG Prevention of infection after gynecologic procedures. (2018). <i>The American College of Obstetricians and Gynecologists</i>, 131(6).</p>	<p><b>Vaginal cleansing with either 4% chlorhexidine gluconate or povidone–iodine should be performed before hysterectomy or vaginal surgery.</b> Currently, only povidone–iodine preparations are approved by the U.S. Food and Drug Administration (FDA) for vaginal surgical site antisepsis. In the United States, 4% chlorhexidine gluconate soap (containing 4% isopropyl alcohol) is often used off-label to prepare the vagina in women with iodine allergy, and some U.S. institutions prefer it for routine cases. To avoid irritation, chlorhexidine gluconate with high concentrations of alcohol (eg, 70% isopropyl alcohol, commonly used for skin preparation) is contraindicated for surgical preparation of the vagina. However, solutions that contain lower concentrations, such as the commonly used 4% chlorhexidine gluconate soap containing 4% alcohol, are usually well tolerated and may be used for vaginal surgical preparation as an alternative to iodine-based preparations in cases of allergy or when preferred by the surgeon.</p>
<p><a href="#">SHEA/IDSA/APIC Practice Recommendation Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update</a></p>	<p><b>Use antiseptic-containing preoperative vaginal preparation agents for patients undergoing cesarean delivery or hysterectomy.</b> (Quality of evidence: MODERATE)</p> <p>Use of povidone-iodine or CHG-based vaginal preparation agents immediately before cesarean delivery reduces endometritis by 59%, with possibly even greater benefit among women in labor. Products should be chosen and used in accordance with manufacturer’s instructions for use.</p> <p>Vaginal preparation with antiseptic solution is also recommended for elective hysterectomy</p>

# Preoperative Mechanical Bowel Preparation (MBP) Regimen

	Count	% of Answers (All Responses)
For colon procedures, does your facility outline in policies or protocols a patient preoperative mechanical bowel preparation (MBP) regimen?		
Yes	13	26.00%
No: Facility policies and protocols do not outline recommended a patient preoperative mechanical bowel preparation regimen. The decision is left to the surgeon.	19	38.00%
Unsure	5	10.00%
Other	3	6.00%
Didn't Answer	10	20.00%
<b>Policies and protocols for MBP and Antibiotics (13)</b>		
Policies and protocols outline a patient preoperative MPB in addition to the use of oral antibiotics.	7	53.85%
Policies and protocols only outline a patient preoperative MPB preparation.	4	30.77%
Didn't Answer	2	15.38%



# Preoperative Mechanical Bowel Preparation (MBP) Regimen

Reference Source	
<p>ASCRS and SAGES</p> <p>Clinical Practice Guidelines for Enhanced Recovery After Colon and Rectal Surgery From the American Society of Colon and Rectal Surgeons and the Society of American Gastrointestinal and Endoscopic Surgeons</p> <p>2023 update</p>	<p>Mechanical bowel preparation combined with preoperative oral antibiotics is typically recommended prior to elective colorectal resection. Grade of recommendation: strong recommendation based on moderate-quality evidence</p>
<p>ASCRS</p> <p>The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the Use of Bowel Preparation in Elective Colon and Rectal Surgery</p> <p>Updated 2019</p>	<p><b>MBP combined with preoperative oral antibiotics is typically recommended for elective colorectal resections. Grade of Recommendation: Strong recommendation based on moderate-quality evidence, 1B.</b></p> <p>Preoperative MBP alone, without oral antibiotics, is generally not recommended for patients undergoing elective colorectal surgery. Grade of Recommendation: Strong recommendation based on high-quality evidence, 1A.</p> <p>Preoperative oral antibiotics alone, without mechanical preparation, are generally not recommended for patients undergoing elective colorectal surgery. Grade of Recommendation: Weak recommendation based on low-quality evidence, 2C.</p> <p>Preoperative enemas alone, without MBP and oral antibiotics, are generally not recommended for patients undergoing elective colorectal surgery. Grade of Recommendation: Weak recommendation based on moderate-quality evidence, 2B.</p>
<p><a href="#">SHEA/IDSA/APIC Practice Recommendation Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update</a></p>	<p>Use a combination of parenteral and oral antimicrobial prophylaxis prior to elective colorectal surgery to reduce the risk of SSI. (Quality of evidence: HIGH)</p> <p>Mechanical bowel preparation without use of oral antimicrobial agents does not decrease the risk of SSI</p>
<p>ERAS</p> <p>Guidelines for Perioperative Care in Elective Colorectal Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations: 2018</p>	<p>Mechanical bowel preparation alone with systemic antibiotic prophylaxis has no clinical advantage and can cause dehydration and discomfort and should not be used routinely in colonic surgery but may be used for rectal surgery.</p> <p><b>There is some evidence from randomized controlled trials to support the use of a combination of MBP and oral antibiotics over MBP alone.</b></p> <p>In patients receiving oral mechanical bowel preparation, oral antibiotics should be given.</p> <p>No recommendation for the use of oral antibiotic decontamination can be given for patients having no bowel preparation.</p>

# Closing COLO Case

	Count	% of Answers (All Responses)
When closing a colon case, it is standard at our facility to change gloves (or remove outer gloves if double-gloving is practiced) and have a separate sterile field set-up for closing?		
Yes: change gloves (or remove outer gloves if double gloved) and use a separate sterile field set-up for closing.	17	34.00%
Only change gloves but do not use a separate sterile field set-up for closing.	5	10.00%
Only use a separate sterile field set-up for closing, but do not change gloves.	2	4.00%
Neither change gloves nor use a separate sterile field set-up for closing tray.	4	8.00%
Unsure of the practice.	8	16.00%
Didn't Answer	14	28.00%

# Closing COLO Case

Reference Source	
<p>ACS American College of Surgeons and Surgical Infection Society: Surgical Site Infection Guidelines, 2016 Update</p>	<p><b>Gloves/Gown Change</b> The use of double gloves is recommended. Changing gloves before closure in colorectal cases is recommended, however, rescrubbing before closure in colorectal cases is not recommended.</p> <p><b>New Closing Tray/Instrumentation</b> The use of new instruments for closure in colorectal cases is recommended.</p>
<p>ASCRS <a href="#">Reducing Surgical Site Infection: Where Do I Look?</a></p>	<p>Perioperative list of elements to consider in developing a comprehensible approach to reducing rates of SSI:</p> <ul style="list-style-type: none"> <li>• Gown/glove change</li> <li>• New closing trays</li> </ul>
<p>JAMA The Preventive Surgical Site Infection Bundle in Colorectal Surgery: An Effective Approach to Surgical Site Infection Reduction and Health Care Cost Savings</p>	<p>Colorectal surgery: At the time of wound closure, surgeons and scrub staff underwent a gown and glove change. (pg. 1047)</p> <p>Colorectal surgery: dedicated wound closure tray used to close the fascia and skin. (pg. 1047)</p>
<p>AORN <a href="#">An Incision Closure Bundle for Colorectal Surgery</a> 2018</p>	<p>Outer surgical glove change before incision closure. Use of a dedicated sterile incision closure instrument tray</p>

# References used for Survey Development

## ACOG (The American College of Obstetricians and Gynecologists)

- Prevention of infection after gynecologic procedures. (2018). The American College of Obstetricians and Gynecologists, 131(6).
- Not a free resource

## SHEA (Society for Healthcare Epidemiology of America)

- SHEA Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update
- Calderwood MS, Anderson DJ, Bratzler DW, et al. (2023). Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update. *Infection Control & Hospital Epidemiology*, 44: 695–720, doi: 10.1017/ice.2023.67
- Available at <https://infectioncontrol.ucsfmedicalcenter.org/sites/g/files/tkssra4681/f/strategies-to-prevent-surgical-site-infections-in-acute-care-hospitals-2022-update.pdf>

## JAMA (Journal of the American Medical Association) Review Article

- Seidelman JL, Mantyh CR, Anderson DJ. Surgical Site Infection Prevention: A Review. *JAMA*. 2023;329(3):244–252. doi:10.1001/jama.2022.24075
- Available at <https://jamanetwork.com/journals/jama/fullarticle/2800424>

## AORN (Association of periOperative Registered Nurses)

- AORN Article: An Incision Closure Bundle for Colorectal Surgery
  - Available at <https://aornjournal.onlinelibrary.wiley.com/doi/full/10.1002/aorn.12120>
- AORN eGuidelines+ Guidelines for Perioperative Practice:
  - Sterile Technique
  - Transmission-Based Precautions
  - Surgical Attire
  - Facility Operating Room Design and Maintenance
  - Hand Hygiene
  - Hypothermia
- Not a free resource
  - Available for members at: <https://aornguidelines.org/guidelines?bookid=2260>

# References used for Survey Development

## CDC (Centers for Disease Control and Prevention)

- Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017
- Available at <https://jamanetwork.com/journals/jamasurgery/fullarticle/2623725>

## APIC (Association for Professionals in Infection Control and Epidemiology)

- APIC Implementation Guide: Infection Preventionist's Guide to the OR
- Available at: <https://apic.org/Professional-Practice/Implementation-guides/>

## American College of Surgeons and Surgical Infection Society

- Seidelman JL, Mantyh CR, Anderson DJ. Surgical Site Infection Prevention: A Review. *JAMA*. 2023;329(3):244–252. doi:10.1001/jama.2022.24075
- Available at:  
[https://journals.lww.com/journalacs/citation/2017/01000/american\\_college\\_of\\_surgeons\\_and\\_surgical.8.aspx](https://journals.lww.com/journalacs/citation/2017/01000/american_college_of_surgeons_and_surgical.8.aspx)
- Not a free resource, and need to be a member to log in

## ERAS (Enhanced Recovery After Surgery Society)

- Gustafsson, U.O., Scott, M.J., Hubner, M. et al. Guidelines for Perioperative Care in Elective Colorectal Surgery: Enhanced Recovery After Surgery (ERAS®) Society Recommendations: 2018. *World J Surg* 43, 659–695 (2019). <https://doi.org/10.1007/s00268-018-4844-y>
- Available at <https://link.springer.com/article/10.1007/s00268-018-4844-y>

# References used for Survey Development

## AST (Association of Surgical Technologists)

- AST Standards of Practice for Surgical Attire, Surgical Scrub, Hand Hygiene and Hand Washing
- Available at [https://www.ast.org/uploadedFiles/Main\\_Site/Content/About\\_Us/Standard\\_Surgical\\_Attire\\_Surgical\\_Scrub.pdf](https://www.ast.org/uploadedFiles/Main_Site/Content/About_Us/Standard_Surgical_Attire_Surgical_Scrub.pdf)

## CMS (Centers for Medicare and Medicaid Services)

- Centers for Medicare and Medicaid Services Hospital Infection Control Worksheet (attachment 1)
- Available at: <https://www.cms.gov/medicare/provider-enrollment-and-certification/surveycertificationgeninfo/downloads/survey-and-cert-letter-15-12-attachment-1.pdf>

## Nebraska Title 175 Health Care Facilities And Services Licensure-Chapter 9 Hospitals

- Available at [https://www.nebraska.gov/rules-andregs/regsearch/Rules/Health\\_and\\_Human\\_Services\\_System/Title-175/Chapter-09%20Emergency%20Rule%20Effective%20Until%202011-30-2023.pdf](https://www.nebraska.gov/rules-andregs/regsearch/Rules/Health_and_Human_Services_System/Title-175/Chapter-09%20Emergency%20Rule%20Effective%20Until%202011-30-2023.pdf)
- Updated 9/1/202

## TJC (The Joint Commission)

- Attire - Determining Requirements for Operating Room / Surgical Attire
- Available at <https://www.jointcommission.org/standards/standard-faqs/ambulatory/leadership-ld/000002266/>

# Next Steps

# Next Steps to Decrease SSI

- Survey results will be used by the committee to develop guidance for best practices
- Offering onsite SSI-focused ICAR assessments to those with high SIR rates, as well as any facility interested.
- One-on-one outreach and assistance, as needed, is also available



# ICAR (infection Control Assessment and Response) Site Visits with ICAP

Visits are scheduled for both prevention and outbreak-related visits for all healthcare setting

The ICAP team evaluates infection prevention practices in a peer-to-peer, non-regulatory format.

ICAR evaluations are friendly, confidential, and free.

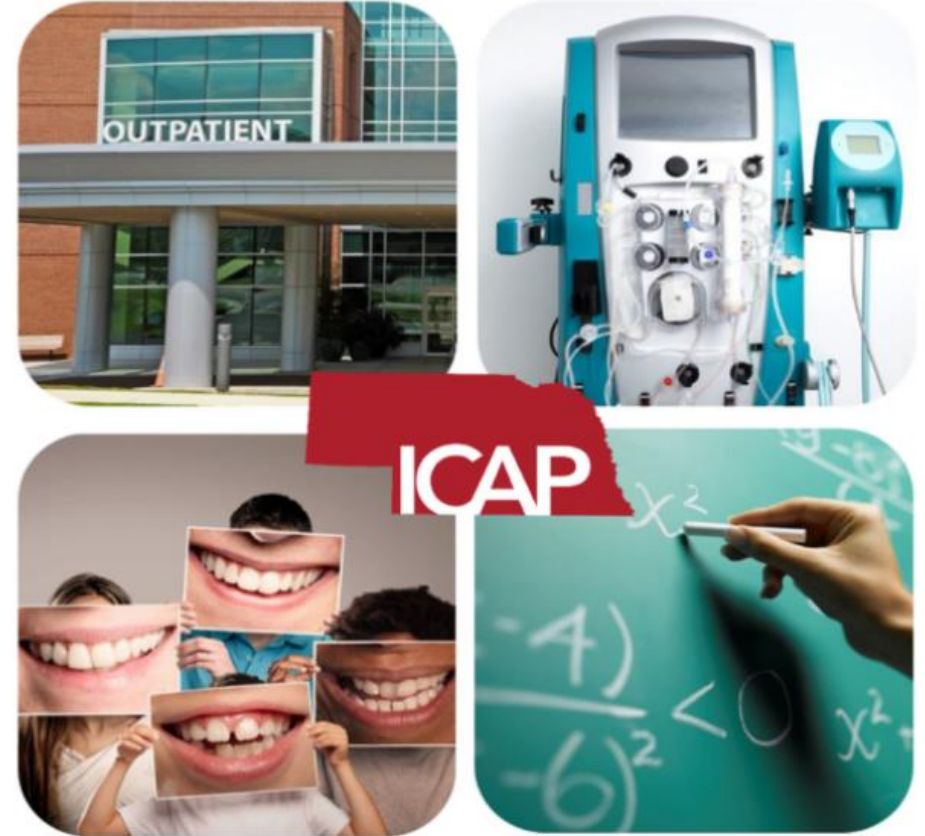
A visit generally takes 6 hours, but we are happy to customize the evaluation to any time frame that works best for the facility's schedule and can consider remote options.

Most facilities find the informal dialogue during the visit to be most helpful.

On the day of the ICAR, we initially start out by sitting down and discussing current procedures related to infection control.

Following, a portion of the visit will include touring the building and observing areas such as supply storage, laundry processing, hand hygiene, donning/doffing of PPE, point of care blood glucose testing and medication preparation areas .

Any facility leadership are welcome participate during the visit.



<https://icap.nebraskamed.com/icar-assessments/>

# What is Assessed during an SSI- Focused ICAR visit?

The visit would focus on the areas related to SSI prevention, including:

- Policies & Procedures related to Infection Prevention Control (IPC) and SSI Prevention
- Infection Control Training, Competency, and Audits
- Perioperative Environment
- Sterile Processing and Device Reprocessing
- Personal Protective Equipment
- Environmental Cleaning
- Hand Hygiene
- Medication Administration & Injection Safety



# Assessment Tools

	A	B	C	D	E
1	Domain	Question ID	Elements To Be Assessed	Assessment	Notes
47	Hand Hygiene	040100	Hand hygiene policies promote preferential use of alcohol-based hand rub (ABHR) over soap and water in most clinical situations. <i>Note: Soap and water should be used when hands are visibly soiled (e.g., blood, body fluids) and is also preferred after caring for a patient with known or suspected C. difficile or norovirus during an outbreak or if rates of C. difficile infection (CDI) in the facility are persistently high.</i>		
48	Hand Hygiene	040200	All personnel receive training and competency validation on HH at the time of employment.		
49	Hand Hygiene	040201	All personnel received training and competency validation on HH within the past 12 months.		
50	Hand Hygiene	040202	Facility maintains current documentation of hand hygiene competency for all personnel.		
51	Hand Hygiene	040300	The facility routinely audits (monitors and documents) adherence to hand hygiene. <i>Note: If yes, facility should describe auditing process and provide documentation of audits</i>		
52	Hand Hygiene	040301	The facility provides feedback to personnel regarding their hand hygiene performance. <i>Note: If yes, facility should describe feedback process and provide documentation of feedback reports</i>		
53	Hand Hygiene	040400	Supplies necessary for adherence to HH (e.g., soap, water, paper towels, alcohol-based hand rub) are readily accessible in resident care areas (i.e., nursing units, resident rooms, therapy rooms).		



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# ICAR Response Report

A Priority	B Infection Prevention & Control Domains	C Findings	D Recommendations	E References & Resources (Short Name)	P
8 Medium	Surveillance and Disease Reporting	<p>Facility does not use a standardized report form for inter-facility transfer that includes history of colonized infections (e.g., MRSA, VRE, ESBL, etc.)</p> <p>There is a spot on the facesheet that is included in the packet for resident transfers</p>	<p>Consider implementation of standardized report/ transfer form that includes infection status and history of colonized infections for any resident being admitted or transferring outside of facility (i.e. to hospital).</p> <p>The CDC reference listed in column E could be used in entirety or similar questions could be built into a facility specific communication tool.</p>	CDC - IC Transfer Form	
9 High	Environmental Cleaning	Containers of disinfect solutions, as well as other cleaning chemicals, are not labeled with an expiration date.	Containers used to store the prepared solutions should be clean, clearly labeled, and have an expiration date based on the manufacturer's instructions for stability. They should be clean and dried before refilling and new solution should not be added to old solution ("topping off")	CDC - Environmental Cleaning; CDC - Environmental Infection Control Guidelines	
0 Low	Infection Control Program and Infrastructure	<p>Overall, clean and/or sterile items were being stored in a safe manner throughout the facility, keeping items safe from contamination.</p> <p>Wire shelving noted in storage area without solid bottom.</p> <p>There was corrugated cardboard boxes noted throughout.</p>	<p>Store clean and sterile supplies in a designated area that is separate from other areas and is clean and dry, well-ventilated, and protected from dust, vermin, moisture, humidity extremes, and temperature extremes. Clean items cannot be stored with contaminated items or chemicals.</p> <p>External shipping containers and corrugated boxes should not be permitted in clean or sterile storage areas/rooms. These containers can collect dust, debris, and insects during shipment and can carry contaminants into the area.</p> <p>Items should not be stored directly on the ground to avoid contamination of clean or sterile products and to allow for cleaning of the floor.</p> <p>The bottom shelf of storage carts or shelving should be solid and 8-10 inches from the floor. A solid bottom prevents contaminants from the floor from reaching the content on the cart and prevents water from touching items on the bottom shelf when mopping.</p> <p>Recommend covering the bottom of wire shelving units with plastic/acrylic sheet for protection of items stored on bottom shelves.</p>	ASHE - Physical Environment; TJC - Environmental Infection Prevention	



# QUESTIONS?



# THANK YOU

## DIVISION OF PUBLIC HEALTH

NEBRASKA

Good Life. Great Mission.

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