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Health Care Associated Infections in Colorado

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EXECUTIVE SUMMARY

This report presents data on health care associated infections (HAI) reported by Colorado health facilities. HAI are infections that are not present or developing when a patient is admitted to a health care facility and include infections associated with surgeries, central lines and dialysis treatment. HAI can be devastating to patients and families causing a significant financial burden due to additional medications, treatments, procedures, lost wages, short- and long-term illnesses, as well as pain, suffering and death.[1] Recognizing the seriousness of HAI, Colorado passed the HAI Disclosure Law (House Bill 06-1045) in 2006. This statute requires acute care hospitals, rehabilitation hospitals, long term acute care hospitals, selected hospital units, ambulatory surgery centers and outpatient dialysis treatment centers to report designated HAI data as a condition of their state licensure.

This report was written to fulfill reporting requirements set forth in the Disclosure Law and is the eighth annual report published by the Colorado Department of Public Health and Environment. It is submitted each year to the Colorado Legislature by January 15. The report presents information about HAI reporting requirements, processes and limitations; functions of implementing the Disclosure Law; and HAI data submitted by Colorado health care facilities on surgical site infections (SSI), central line associated bloodstream infections (CLABSI), *Clostridium difficile* infections (CDI), and dialysis-related infections.

Key findings described in this report are summarized in Table 1 and include the following:

- Of reportable surgeries in Colorado, the three most common surgeries performed between August 1, 2013 and July 31, 2014 were knee replacements (n=14,567 in hospitals and 635 in ambulatory surgery centers), breast procedures (n=9,899 in hospitals and 5,476 in ambulatory surgery centers) and hip replacements (n=9,740 and 278 in ambulatory surgery centers).
- Most Colorado health facilities had HAI rates similar to national rates for most reportable HAI.
- Statewide aggregate SSI rates for coronary artery bypass surgeries were better than national rates this year.
- Statewide aggregate SSI rates for colon surgeries, abdominal hysterectomies, and hip and knee replacement surgeries performed in hospitals have been better than national rates for the last three years.
- Statewide aggregate SSI rates for hernia repairs performed in ambulatory surgery centers have been better than national rates for the last three years.
- Statewide aggregate rates for breast surgeries performed in hospitals have been worse than national rates for the last three years.
- Ambulatory surgery centers traditionally report fewer infections than hospitals, which might be due in part to reduced opportunity to conduct post surgical follow-up with patients and surgeons.
- Statewide aggregate CLABSI rates in long-term acute care hospitals were better than the national average. CLABSI rates for adult critical care units, neonatal critical care units, and rehabilitation hospitals remained steady and the same as national rates.
- Statewide, Colorado's aggregate dialysis access related bloodstream infection rates have been the same as national rates in the last two reporting years.
- Statewide aggregate rates for CDI were similar to national rates in the last reporting year.

Table 1: Healthcare Associated Infections Summary Table – Colorado, August 2013-July 2014

Health Care Associated Infection Type	No. of Facilities Reporting Data	No. of Facilities Reporting Zero Infections	No. of Facilities *Better* than National Rate	No. of Facilities *Worse* than National Rate	Comparison: Colorado to National Rate
Surgical Site Infections in Hospitals Procedure Type					
Breast Surgery	62	20	0	4	Worse
Colon Surgery	55	3	7	1	Better
Coronary Artery Bypass	17	5	1	0	Better
Hip Replacement	58	21	2	1	Better
Knee Replacement	60	18	2	0	Better
Abdominal Hysterectomy	55	12	1	0	Better
Vaginal Hysterectomy	56	24	0	1	Same
Surgical Site Infections in Ambulatory Surgery Centers Procedure Type					
Breast Procedure	32	13	0	1	Same
Hernia Repair	33	19	0	0	Better
Hip Replacement	2	2	0	0	Same
Knee Replacement	6	6	0	0	Same
Vaginal Hysterectomy	4	4	0	0	Same
Central Line Associated Bloodstream Infections Unit Type					
Adult Critical Care Units	60	28	0	0	Same
Neonatal Critical Care Units	18	10	0	1	Same
Long Term Acute Care Hospitals	9	3	0	0	Better
Inpatient Rehabilitation Hospitals or Wards	17	15	0	0	Same
Dialysis Related Infections Infection Type					
Access Related Bloodstream Infections	71	10	1	6	Same
Local Access Infections	71	8	National rate not yet available		
***Clostridium difficile* Infections in Acute Care Hospitals**					
Facility Wide-Lab Identified	53	7	6	9	Same

While this report only includes information on a subset of HAI, the information provided can be used as an important indicator of health care quality and infection prevention efforts in Colorado facilities. Beyond the number and rate of HAI for each facility, consumers can see the volume of procedures performed at each facility, which can be an indicator of experience and practice.

The Colorado Department of Public Health and Environment will continue its work to reduce HAI in Colorado through various activities, including the tracking and publishing of HAI data, completion of HAI data validation studies, implementation of HAI prevention collaboratives, maintenance of communication vehicles for HAI related information and collaboration with internal and external partners committed to patient safety. It is hoped health care facilities will use the data in this report to target and improve infection prevention efforts and consumers will use the data to make informed health care choices.

Health Facility-Acquired Infections Report

Overview of HAI Reporting

INTRODUCTION

Health care associated infections (HAI) are infections that are not present or developing when a patient is admitted to a health care facility. They include infections associated with surgeries, central lines and dialysis treatment. HAI can be devastating to patients and families causing significant financial burden due to additional medications, treatments, procedures, lost wages, short- and long-term illnesses, as well as pain, suffering and death.[1] Colorado recognizes the seriousness of this public health threat and passed HAI reporting legislation in 2006. Colorado's HAI Disclosure Law (House Bill 06-1045) requires hospitals, including acute care, rehabilitation, and long term acute care hospitals, hospital units, ambulatory surgery centers and dialysis treatment centers to report designated HAI data as a condition of state licensure.

The Disclosure Law mandates that certain health care facilities report their HAI data through the National Health Care Safety Network (NHSN)[2], a national web-based surveillance and reporting system managed by the Centers for Disease Control and Prevention (CDC). The use of NHSN potentially improves the validity of reported HAI data because facilities must use standard definitions and reporting rules. Reporting consistency allows facility HAI data to be compared to national rates and be more easily understood by health care facilities and the public.

As consumer demand for HAI-related information has increased, policymakers nationwide have acknowledged the need for publishing HAI data in consumer-focused health care quality reports. This report is the eighth annual report published by the Colorado Department of Public Health and Environment's Health Facility Infection Surveillance Unit (formerly known as the Patient Safety Program) and is due to the Health and Human Services Committees of the Colorado Senate and House of Representatives on January 15, 2015.

The report presents information about HAI reporting requirements, processes and limitations; functions of implementing the Disclosure Law; and HAI data submitted by Colorado health care facilities on selected surgical site infections (SSI), central line associated bloodstream infections (CLABSI), *Clostridium difficile* infections (CDI) and dialysis-related infections. The SSI data presented in this report occurred in patients having surgeries anytime from August 1, 2011 through July 31, 2014. The CLABSI and dialysis-related infections presented occurred in patients who received medical treatment from August 1, 2011 through July 31, 2014 and the CDI presented occurred in patients who were hospitalized anytime from January 1, 2013 through July 31, 2014.

HAI DISCLOSURE LAW IMPLEMENTATION

Implementing Colorado's HAI Disclosure Law involves four main functions, as described below:

1. Appointment and coordination of an HAI advisory committee;
2. Selection of clinical metrics;
3. Oversight and validation of data entered into NHSN, and;
4. Reporting results.

1: APPOINTMENT AND COORDINATION OF AN HAI ADVISORY COMMITTEE

Colorado's Disclosure Law requires the department's executive director to appoint an 11-member HAI advisory committee, the Colorado Health Facility-Acquired Infections Advisory Committee, with the following composition: one representative each from a public and private hospital; a representative of a health insurer; a consumer/purchaser of health insurance; a representative of a health consumer organization; four infection control practitioners (one from a stand-alone ambulatory surgery center (ASC) and three infection preventionists board certified in infection control and epidemiology); a board certified or board eligible physician who is licensed in Colorado, affiliated with a Colorado hospital or medical school, and an active member of a national organization specializing in health care epidemiology or infection control; and a Master or PhD level medical statistician or clinical microbiologist.

Advisory Committee Members

1. **Dawn Benham,** RN, BSN, CIC
   East Morgan County Hospital
2. **Ryan Biehle**
   Colorado Consumer Health Initiative
3. **Linda Burton,** RN, BSN, CIC
   University of Colorado Health
4. **Colleen Casaceli,** BSN, MPH, CIC
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5. **Carole Hemmelgarn,** MS
   Pfizer
6. **Paul Poduska,** BS, M(ASCP), CIC
   Poudre Valley Hospital
7. **Allison Lee Sabel,** MD, PhD
   Denver Health Medical Center
8. **Peggy SaBell,** RN, MS, CIC
   Kaiser Permanente
9. **Deborah Teetzel,** RN, MSN
   Rocky Mountain Surgery Center
10. **Cindy Thistel,** RN, MSN, CIC
    Littleton Adventist Hospital
11. **Heather Young,** MD
    Denver Health Medical Center

The committee's mission is to provide oversight of legislatively mandated HAI reporting to ensure accountability and improvement of patient health care through education, validation of data and review of reporting requirements and surveillance practices. The committee's goals are to:

- Ensure all components of the Colorado Disclosure Law are implemented;
- Provide guidance in selecting HAI reporting metrics;
- Evaluate relevancy, accuracy of reporting requirements;
- Establish priorities for completing data validation studies;
- Provide input on outreach activities, research projects and other HAI-related projects as needed;
- Provide guidance regarding the Annual Report and other reports developed for consumers and health care personnel, and;
- Promote safe health care for Colorado citizens.

2: SELECTION OF CLINICAL METRICS

The HAI reporting metrics selected include infections related to central lines, surgeries and outpatient dialysis treatment. Central line-associated bloodstream infections (CLABSI) are associated with the presence of central lines in patients. A central line is an intravascular catheter (tube in a vein) that terminates at or close to the heart or in one of the great vessels (i.e., aorta, superior vena cava). Central lines, which may be temporary or permanent, are used to infuse fluids and medications, withdraw blood or monitor fluid volume in patients. The surgeries for which surgical site infections (SSI) are reported were selected based on their high volume and risk for infection. Dialysis related infections include bloodstream infections and localized infections of the vascular access site. Dialysis is a method for removing waste products and fluid from a patient's blood when the kidneys are failing. Because of frequent hospitalizations and weakened immune systems, dialysis patients are at high risk for infection. *Clostridium difficile* infections (CDI) continue to be a growing problem in health care, causing an estimated 14,000 deaths each year. Based on its high incidence and potential severity, Colorado's HAI Advisory Committee added CDI to state reporting requirements for acute care hospitals. Table 2 below depicts Colorado's selected reporting metrics. In selecting metrics, the following factors were considered:[3]

- Impact – extent to which the infection affects the patient or family (disability, mortality and economic costs);
- Improvability – extent to which reporting infection improves practice to prevent the infection;
- Inclusiveness – range of individuals affected by the infection type (e.g., age, gender, socioeconomic status and ethnicity/race);
- Frequency – how often the infection occurs;
- Feasibility – ability for the data to be collected with minimal burden on the facilities;
- Functionality – extent to which the intended audience (patients, care providers and hospital administrators) can understand and apply the results.

Table 2: Colorado Health Care Associated Infection Reporting Metrics

Facility Type	Reported HAI	Reporting Hospital Unit(s)
Acute Care and Critical Access Hospitals	• Breast Surgical Site Infections (SSI) • Colon SSI • Coronary Bypass Graft SSI • Hip Replacement SSI • Knee Replacement SSI • Hysterectomy Abdominal SSI • Hysterectomy Vaginal SSI	Inpatient and Outpatient Surgical Wards
	• Central Line Associated Bloodstream Infections (CLABSI) • *Clostridium difficile* infections*	Adult Critical Care Units
		Neonatal Critical Care Units Level II/III and III
		Inpatient Rehabilitation Units
Rehabilitation Hospitals	• CLABSI	Facility Wide
Long Term Acute Care Hospitals	• CLABSI	Facility Wide
Ambulatory Surgery Centers	• Breast SSI • Hernia Repair SSI • Knee Replacement SSI • Hysterectomy Abdominal SSI • Hysterectomy Vaginal SSI	Not Applicable
Outpatient Dialysis Centers	• Dialysis Events	Not Applicable

*Acute care hospitals only excluding critical access hospitals

3: OVERSIGHT AND VALIDATION OF DATA ENTERED INTO NHSN

Colorado health facilities grant the Colorado Department of Public Health and Environment access to the data they enter into the NHSN so the department can monitor, analyze and produce public reports. The NHSN maintains stringent controls to ensure data security, integrity and confidentiality, and also has the capacity to enable facilities to share data in a timely manner with each other and with public health agencies.

Colorado's Disclosure Law requires health facilities to report HAI data within 30 days of each month's end, and the department provides guidance and technical assistance to ensure the timely and accurate reporting of data. The department also performs systematic monitoring and validation of the HAI data submitted, which allows for the identification and correction of incomplete and incorrectly entered data. The department has completed data validation studies for CLABSI, SSI and dialysis-related infections and will conduct validation studies of additional infections as funding and staffing permit. See Appendix A for a description of validation studies and HAI prevention projects completed or underway.

The Disclosure Law also specifies requirements for health care facility employees who collect and report HAI data. These individuals must be certified in infection control and epidemiology[4] or become certified within six months of becoming eligible to take the certification exam. These certification requirements do not apply to staff in hospitals with 50 beds or less, dialysis centers or ASC. However, staff members in these facilities must complete specified NHSN educational programs before enrolling in NHSN, complete 10 hours of relevant infection prevention education annually and maintain a log of the completed education.

4: REPORTING RESULTS

The final function of implementation is the publication of annual public reports and semi-annual bulletins. The current report is the eighth annual report published by the department. Semi-annual bulletins provide additional data, research, and information applicable to HAI in Colorado. All HAI reports and bulletins can be found at https://www.colorado.gov/pacific/cdphe/health-care-facility-infection-data.

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PARTICIPATING FACILITIES

This past year, 75 hospitals, 9 long term acute care hospitals (LTAC), 5 rehabilitation hospitals, 55 ASC and 71 dialysis treatment clinics reported HAI data into NHSN. Table 3 shows the number of hospitals that report CLABSI by type of critical care unit and Table 4 lists Colorado's reportable surgical procedures and the numbers of hospitals and ASC that report them.

Table 3: Number of Hospitals Reporting Central Line Associated Bloodstream Infections (CLABSI) by Type of Critical Care Unit – Colorado, August 2013-July 2014

Critical Care Unit	Number of Hospitals
Medical	7
Surgical	1
Medical/Surgical	43
Cardiothoracic surgery	3
Burn	1
Trauma	3
Neurosurgical	4
Level II/III Neonatal Critical Care	13
Level III Neonatal Critical Care	5
Long-term Acute Care Hospitals	9
Inpatient Rehabilitation Hospitals	5
Inpatient Rehabilitation Hospital Units	12

Table 4: Number of Hospitals and Ambulatory Surgery Centers Performing Reportable Procedures – Colorado, August 2013-July 2014

Procedure	Number of Hospitals	Number of Ambulatory Surgical Centers	Total Number of Facilities
Breast Surgery	62	32	94
Colon Surgery	55	NA[2]	55
Coronary Artery Bypass Graft	17	NA[2]	17
Hernia Repair	NA[1]	33	33
Hip Replacement	58	2	60
Knee Replacement	60	6	66
Hysterectomy Abdominal	55	NA[2]	55
Hysterectomy Vaginal	56	4	60

NA = Not applicable
[1] Hospitals no longer report hernia repairs.
[2] Ambulatory Surgery Centers do not perform these procedures.

Health Facility-Acquired Infections Report

Infection Data

INFECTION DATA FORMAT AND CAUTIONS

Data presented in this report cover SSI in patients undergoing surgeries from August 1, 2011 through July 31, 2014; CLABSI and dialysis-related infections in patients receiving medical care from Aug. 1, 2011 through July 31, 2014; and CDI in patients receiving medical care from January 1, 2013 through July 31, 2014. Two forms of HAI data are presented: infection rates that combine all Colorado facilities (aggregate data) and infection rates for each individual facility (facility-specific data). The report further classifies HAI data by procedure and/or device so that facilities can readily identify areas in need of process improvements and target infection prevention efforts.

New in this year's report, *Clostridium difficile* infection (CDI) data are included from acute care hospitals. In addition, the Standardized Infection Ratio (SIR), a summary measure that describes a facility's performance, while taking into account the risk of the facility's patient population, is reported for all infection types except dialysis infections. Conventionally, rates rather than SIRs are reported for dialysis infections.

The SIR is a ratio that compares a facility's observed number of infections to the expected number of infections based on the national average (as determined by historical data collected by the NHSN). A SIR of 1 means that a facility's observed number of infections is equal to the expected number of infections. If the SIR value is greater than 1, there are more infections than expected, and if the SIR is less than 1, there are fewer infections than expected.

The following tables of data include the facility name and city, and for each facility, the number of infections and depending on the type of infection, the number of surgeries (for SSI), patient line days (for CLABSI), patient months (for dialysis-related infections), and patient days (for CDIs).

National Comparison. For all types of infections in this report, a national comparison is shown for each facility, which compares the facility's observed number of infections to the expected number of infections based on the national rate, denominator size (i.e., number of procedures, number of patient months, etc.) and a statistical test of difference between numerical values. The statistical test, known as a Poisson test, calculates the magnitude of difference between a facility's observed and expected number of infections. If there is no significant difference between the facility's observed and expected number of infections, the facility's infection rate is designated as "**SAME."** If the difference is statistically significant and the SIR is greater than 1, the facility has significantly more infections than expected and is designated as "**WORSE."** If the difference is statistically significant and the SIR is less than 1, the facility has significantly fewer HAI than expected and is designated as "**BETTER."** For a more detailed explanation of how the SIR is calculated, see Appendix B.

Cautions. The Colorado Department of Public Health and Environment and the Colorado HAI Advisory Committee recommend caution be used when drawing conclusions from these data for multiple reasons. For one, direct comparisons between facilities may not provide the most accurate assessment because infection rates are influenced by the types of patients treated. Facilities that treat higher volumes of severely ill patients may have higher infection rates regardless of their prevention efforts. While the NHSN system provides the best risk adjustment possible to account for this at present, there always will be patient risk factors that cannot be measured (e.g., individual ability to heal, smoking cessation days), especially in severely ill patients with higher risks of infection.

Second, NHSN surveillance manuals are developed by CDC subject matter experts. Although the definitions and criteria are updated each year, they can be challenging to apply to patients with complicated medical histories. Additionally, facilities use different surveillance techniques to find infections. Some infection preventionists have more resources for surveillance, thus may find and report more infections than other facilities. In those cases, higher infection rates may be based on better surveillance practices rather than poor infection control practices. It is noteworthy that ambulatory surgery centers (ASC) traditionally report lower numbers of SSI than hospitals, which may be due, in part, to reduced opportunity to conduct post surgical follow-up with patients and surgeons.

Finally, users of this report should note that the data presented are self-reported by each facility and that data validation studies have only been completed thus far for selected CLABSI, SSI and dialysis related infections. It is recommended that conclusions regarding health care quality be made in conjunction with other quality indicators and that consumers consult with doctors, health care facilities, health insurance carriers, health care websites from reputable sources (e.g., Hospital Compare, Colorado Hospital Report Card, Leap Frog), and with their families and friends before deciding where to receive care. It is hoped that facilities will use the data in this report to target and improve infection prevention efforts and that consumers will use the data to make more informed health care decisions.

COLORADO AGGREGATE HEALTH CARE-ACQUIRED INFECTION DATA

AGGREGATE SURGICAL SITE INFECTION DATA

Surgical site infections (SSI) are infections directly related to a surgical procedure. Table 5 below shows the statewide aggregate number of SSI and SIRs for reportable procedures by three separate reporting years from August 1, 2011 through July 31, 2014. SSI data are presented for both hospitals and ASC.

Statewide aggregate SSI rates for colon surgeries, abdominal hysterectomies and hip and knee replacement surgeries have been better than national rates for the last three years. The statewide SSI rate for breast surgeries in hospitals has been worse than the national average for the past three years.

Hospitals. When combined statewide, Colorado hospitals had better than national SSI rates for coronary artery bypass surgeries this year. Statewide aggregate SSI rates for colon surgeries, abdominal hysterectomies and hip and knee replacement surgeries have been better than national rates for the last three years. The statewide aggregate SSI rate for breast surgeries in hospitals has been worse than the national average for the past three years.

Ambulatory surgery centers. In general, ASC reported lower rates of SSI than hospitals and as a whole, performed the same or better than national averages. Breast and hernia surgeries were the most common procedure reported by ASC, and the SSI rates for breast surgeries were the same as the national average. For hernia repairs in ASC, SSI rates were better than national averages for the last two reporting years. For the remaining procedures reported by ASC (hip and knee prostheses and vaginal hysterectomies) zero infections were reported across all three years.

Statewide, Colorado facilities have had CLABSI rates the same or better than national averages. This year (August 2013-July 2014), LTACs had better than national CLABSI rates.

AGGREGATE CLABSI DATA

Central line associated bloodstream infections (CLABSI) are associated with specific intravascular catheters used to infuse fluids or medications, withdraw blood or monitor fluid volume in patients. Table 6 shows the statewide aggregate CLABSI central line days, infection counts and SIRs for adult critical care units, neonatal critical care units, long-term acute care hospitals (LTAC), rehabilitation hospitals and rehabilitation wards in Colorado from August 1, 2011 through July 31, 2014.

Statewide, Colorado's CLABSI rates have been the same or better than national averages and this past year, LTACs had better than national CLABSI rates.

Colorado dialysis ARB rates have been similar to national rates for the last two years.

AGGREGATE DIALYSIS INFECTION DATA

Table 7 shows statewide aggregate data for access-related bloodstream infections (ARB) and local access infections (LAI) in Colorado outpatient dialysis centers from August 1, 2011 through July 31, 2014. An ARB, which poses more serious health implications and requires higher levels of care, is

determined by the presence of a microorganism identified in a blood culture, and the source of infection is reported as the vascular access site. An LAI is defined as the presence of pus, redness or swelling of the vascular access site without the presence of an ARB.

In last year's report, dialysis ARB rates appeared better than national rates. Validation studies were conducted in 2012 and 2014 by CDPHE in Colorado dialysis facilities (see Appendix A). These studies identified unreported infections, and facilities subsequently revised their data. The new data show that Colorado dialysis ARB rates have been similar to national rates for the last two reporting years. While the statewide LAI rate is 1.3 per 100 patient months, national LAI rates are not yet available to provide comparisons.

AGGREGATE *CLOSTRIDIUM DIFFICILE* INFECTION DATA

Clostridium difficile is a spore forming bacteria that can cause symptoms ranging from bloating, diarrhea, fever, and abdominal pain to life-threatening colon inflammation, sepsis and even death. Table 8 shows statewide aggregate data for hospital onset *Clostridium difficile* infections (CDI) in Colorado acute care hospitals from January 1, 2013 through July 31, 2014 (CDI data were not available before January 1, 2013). While Colorado hospitals as a whole reported worse than national averages in the first seven months of reporting (January 2012 through July 2013), this year (August 2013 through July 2014) CDI rates were the same as national rates.

TABLE 5: Number of Surgical Site Infections and Standardized Infection Ratios in Hospitals and Ambulatory Surgery Centers – Colorado, August 2011-July 2014

Facility Type and Procedure	August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Hospitals:												
Breast Surgery	9,083	94	1.3	Worse	9,704	101	1.3	Worse	9,899	110	1.3	Worse
Colon Surgery	3,287	128	0.7	Better	4,556	195	0.8	Better	4,707	165	0.6	Better
Coronary Artery Bypass Graft	1,538	26	0.9	Same	1,536	20	0.7	Same	1,620	20	0.7	Better
Hip Replacement	8,735	85	0.8	Better	8,898	90	0.8	Better	9,740	88	0.7	Better
Knee Replacement	13,129	102	0.8	Better	13,407	102	0.8	Better	14,567	90	0.6	Better
Abdominal Hysterectomy	5,217	60	0.7	Better	6,455	76	0.7	Better	6,794	69	0.6	Better
Vaginal Hysterectomy	4,303	45	1.3	Same	2,992	24	1.0	Same	2,943	23	0.9	Same
Ambulatory Surgery Centers:												
Breast Surgery	5,771	19	0.7	Same	5,826	16	0.6	Better	5,476	30	1.1	Same
Hernia	5,700	15	0.6	Better	5,598	9	0.3	Better	6,029	9	0.3	Better
Hip Replacement	169	0	0	Same	203	0	0	Same	278	0	0	Same
Knee Replacement	367	0	0	Same	471	0	0	Same	635	0	0	Same
Vaginal Hysterectomy	36	0	0	Same	44	0	0	Same	46	0	0	Same

SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors.

TABLE 6: Number of Central Line Associated Bloodstream Infections (CLABSI) and Standardized Infection Ratios in Hospitals by Unit Type – Colorado, August 2011-July 2014

Unit Type	August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
	Central Line Days	No. of Infections	SIR	National Comparison	Central Line Days	No. of Infections	SIR	National Comparison	Central Line Days	No. of Infections	SIR	National Comparison
Adult Critical Care Unit	110,923	112	1.0	Same	109,279	89	0.8	Better	110,506	99	0.8	Same
Neonatal Critical Care Unit	19,319	20	0.9	Same	19,101	20	0.8	Same	19,246	17	0.7	Same
Long-Term Acute Care Facility	44,205	38	0.9	Better	38,465	35	0.9	Same	32,750	14	0.4	Better
Inpatient Rehab Facility/Ward	7,591	2	0.3	Same	10,143	2	0.2	Same	10,137	2	0.4	Same

SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors.

TABLE 7: Number of Dialysis Infections and Standardized Infection Ratios in Outpatient Dialysis Facilities by Infection Type – Colorado, August 2011-July 2014

Infection Type	August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
	Patient Months	No. of Infections	Rate	National Comparison	Number of Patients	No. of Infections	Rate	National Comparison	Number of Patients	No. of Infections	Rate	National Comparison
Access-Related Bloodstream (ARB)	39,977	223	0.6	Better	39,969	258	0.6	Same	34,088	275	0.8	Same
Local Access Infection (LAI)	39,977	361	0.9	NA	39,969	568	1.4	NA	34,088	446	1.3	NA

Note: ARB infection= presence of a microorganism identified in a blood culture, and the source of infection is reported as the vascular access. LAI= presence of pus, redness or swelling of the vascular access site.

TABLE 8: Number of Hospital-Onset *Clostridium difficile* infections and Standardized Infection Ratios in Hospitals – Colorado, January 2013-July 2014

	January - July 2013				August 2013- July 2014			
	Patient Days	No. of Infections	SIR	National Comparison	Patient Days	No. of Infections	SIR	National Comparison
***Clostridium difficile* infection**	942,556	752	1.1	Worse	1,626,386	1,177	1.0	Same

SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for patient and facility risk factors.

COLORADO FACILITY SPECIFIC HEALTH CARE-ACQUIRED INFECTION DATA - SURGICAL SITE INFECTION OVERVIEW

Surgical site infections (SSI) are infections directly related to a surgical procedure. It is estimated that more than 20 percent of HAI are attributed to SSI, equating to infections in approximately two percent of all surgical procedures nationally.[5] The impact from an SSI can be devastating, often leading to a longer hospital stay, additional treatment and higher costs.[6] The economic toll per patient occurrence is estimated to be between $3,000 and $25,500 depending on the procedure and pathogen(s) involved.[1,7] Overall in the United States, SSI can cost consumers and health care payers from 3 to 10 billion dollars each year.[1]

Surgical procedures required for SSI reporting are selected because they are (1) performed at a high volume, (2) performed at a variety of facilities, and (3) associated with a high risk for SSI. The surgeries monitored for SSI in Colorado include cardiac procedures, hip and knee replacements, hernia repairs, hysterectomies (abdominal and vaginal), and breast and colon procedures. The NHSN manual defines reportable procedures for surveillance as those that occur in a single trip to an operating room where the incision is closed following the procedure.[2] Surgeries are performed as either inpatient or outpatient procedures.

Reportable infections occur within 30 or 90 days of the procedure, depending on the type of procedure and infection depth. Common signs of infection include fever, pain or tenderness, drainage from the incision site, redness, or presence of an abscess. In NHSN, SSI are classified into three different categories based on the depth of the infection.

- Superficial incision infection, which involves only the top layers of the skin.
- Deep incision, which involves deeper soft tissues (e.g., fascia and muscle layers).
- Organ space, which involves any part of the body that is opened or manipulated during the surgical procedure, excluding the top layers of skin, fascia or muscle layers.

Every table presenting SSI data below lists each facility in Colorado that performed the designated procedure, its city, the number of procedures performed, number of infections, standardized infection ratio (SIR) and a comparison to national infection data. For a detailed explanation of how the SIR is calculated, see Appendix B. There are three categories that indicate how a facility's own infection rate compares to the national infection rate. These are:

1. Statistically fewer infections than expected based on national infection rates (**better**);
2. Statistically similar infections as expected based on the national infection rates (**same)**; or
3. Statistically more infections than expected based on national infection rates (**worse**).

CARDIAC PROCEDURES

BACKGROUND

A heart bypass, also known as a coronary artery bypass graft, is a surgery used to bypass blocked heart arteries by creating new passages for blood to flow to the heart muscle. Arteries or veins from other parts of the body are used as grafts to create alternative blood-flow pathways. There are two types of coronary artery bypass graft surgeries: one that has both chest and donor site incisions (CBGB) and one that uses a chest incision only (CBGC). Both types involve replacing damaged sections of one or more coronary arteries with undamaged arteries or veins such as the internal mammary artery (thoracic) and saphenous vein (leg) to increase cardiac blood flow. The majority of cardiac operative procedures performed in Colorado hospitals are CBGB. Based on the small number of CBGC surgeries performed, most SSI data associated with CBGC had to be suppressed to protect confidential health information and therefore, CBGC data are not presented in this report.

Seventeen hospitals reported a total of 1,620 CBGB procedures this past year. Five hospitals reported zero SSI. One hospital had a CBGB SSI rate better than the national average; all other hospitals' rates were the same as the national average.

RESULTS

Table 9 shows facility-specific data for SSI attributed to CBGB surgeries performed in hospitals from August 1, 2013 through July 31, 2014. Historical data for two previous reporting years are also provided.

Seventeen hospitals reported a total of 1,620 **CBGB** surgeries this past year. Five hospitals reported zero SSI. One hospital had a CBGB SSI rate better than the national average; all other hospitals' rates were the same as the national rate.

TABLE 9: Number of Surgical Site Infections and Standardized Infection Ratios for Coronary Artery Bypass Grafts with Chest and Donor Site Incisions By Specific Hospital – Colorado, August 2011-July 2014

Surgical Site Infections in Coronary Artery Bypass Grafts With Chest And Donor Site Incisions: August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Boulder Community Hospital	Boulder	65	1	0.8	Same	54	0	0	Same	56	1	0.9	Same
Centura Penrose St Francis Health	Colorado Springs	221	4	1.1	Same	183	3	1	Same	226	2	0.5	Same
Centura Porter Adventist Hospital	Denver	110	4	2.4	Same	96	1	0.7	Same	98	4	3	Same
Centura St Anthony Hospital	Lakewood	71	1	0.6	Same	64	0	0	Same	74	0	0	Same
Exempla Lutheran MC	Wheat Ridge	89	0	0	Same	89	0	0	Same	78	1	0.6	Same
Exempla St Joseph Hospital	Denver	166	1	0.3	Same	230	0	0	Better	213	0	0	Better
Longmont United Hospital	Longmont	15	***	***	***	0	***	***	***	0	***	***	***
MC of Aurora	Aurora	66	0	0	Same	58	3	2.4	Same	80	0	0	Same
MC of the Rockies	Loveland	152	4	1.1	Same	169	0	0	Better	249	5	0.9	Same
Memorial Hospital Central	Colorado Springs	151	0	0	Same	168	2	0.8	Same	151	2	0.9	Same
North Colorado MC	Greeley	68	3	2.4	Same	54	3	2.9	Same	64	0	0	Same
Parkview MC	Pueblo	60	3	2.6	Same	56	0	0	Same	15	***	***	***
Presbyterian St Luke's MC	Denver	13	***	***	***	15	***	***	***	11	***	***	***
Rose MC	Denver	19	***	***	***	15	***	***	***	15	***	***	***
Sky Ridge MC	Lone Tree	16	***	***	***	22	0	0	Same	23	0	0	Same
St Mary's Hospital	Grand Junction	124	1	0.5	Same	111	2	1.2	Same	110	1	0.6	Same
Swedish MC	Englewood	54	2	2.4	Same	56	2	2.2	Same	65	2	1.8	Same
University of Colorado Hospital	Aurora	78	1	0.5	Same	96	3	1.2	Same	92	2	0.8	Same

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.
National comparison based on the indirect adjustment of modeled risk factors for each procedure type.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
Source: National Health Care Safety Network (NHSN) Database.

ORTHOPEDIC PROCEDURES

BACKGROUND

A total or partial hip replacement is a surgery for people with severe hip damage or pain related to chronic osteoarthritis, rheumatoid arthritis, or other degenerative processes involving the hip joint. The surgical procedure for a hip replacement (HR) involves removing the damaged cartilage and bone from the hip joint and replacing them with an artificial device. The procedure consists of placing a cup, which is typically plastic, ceramic or metal, to replace the hip socket, a metal or ceramic ball to replace the head of the thighbone, and a metal stem to attach to the bone.

A total or partial knee replacement (KR) is a surgery for people with severe knee damage and pain related to osteoarthritis, rheumatoid arthritis or traumatic arthritis. A total knee replacement involves removing the damaged cartilage and bone from the surface of the knee joint and replacing them with an artificial device. In this procedure, the patella (kneecap) is removed, the femur (thigh bone) and tibia (shin bone) are cut down, and a metal, ceramic or plastic prosthesis is put in place.

Fifty-eight hospitals reported 9,740 HR procedures last year. Twenty one reported zero HR SSI. Two hospitals had HR SSI rates better than the national average and one had worse rates.

RESULTS

Tables 10 and 11 show facility specific data for SSI attributed to **hip and knee procedures** performed in hospitals (inpatient and outpatient) and ASC (outpatient only) from August 1, 2013 through July 31, 2014. Historical data for two previous reporting years are also provided.

Fifty-eight hospitals reported 9,740 HR procedures this past year, 21 of which reported zero HR SSI. Two hospitals had HR SSI rates better than the national average and one had worse rates.

Two ASC reported a total of 278 HR procedures this past year; both ASC reported zero HR SSI.

Sixty hospitals reported 14,567 KR procedures this past year; 18 reported zero KR SSI. Two hospitals had KR SSI rates better than the national average, and all others had rates similar to the national average.

Sixty hospitals reported 14,567 KR procedures this past year; 18 reported zero KR SSI. Two hospitals had KR SSI rates better than the national average.

Six ASC reported 635 KR procedures this year and all reported zero infections.

TABLE 10: Number of Surgical Site Infections and Standardized Infection Ratios for Hip Replacement (Total or Partial) by Specific Hospital and Ambulatory Surgery Center (ASC) – Colorado, August 2011-July 2014

Surgical Site Infections in Hip Replacement Procedures in Hospitals and Ambulatory Surgery Centers: August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	50	0	0	Same	159	0	0	Same	119	0	0	Same
Arkansas Valley Regional MC	La Junta	18	***	***	***	11	***	***	***	16	***	***	***
Aspen Valley Hospital	Aspen	9	***	***	***	51	0	0	Same	59	0	0	Same
Boulder Community Hospital	Boulder	321	4	1.3	Same	244	2	0.9	Same	325	2	0.6	Same
Castle Rock Adventist Hospital	Castle Rock	Not yet operating				Not yet operating				73	0	0	Same
Centura Avista Adventist Hospital	Louisville	113	1	1	Same	99	4	4	Worse	94	3	2.8	Same
Centura Littleton Adventist Hospital	Littleton	104	1	0.7	Same	115	0	0	Same	149	1	0.5	Same
Centura Penrose St Francis Health	Colorado Springs	525	3	0.5	Same	480	1	0.2	Same	494	1	0.2	Better
Centura Porter Adventist Hospital	Denver	576	7	1.3	Same	620	5	0.9	Same	713	12	1.5	Same
Centura St Anthony Hospital	Lakewood	146	4	1.9	Same	150	3	0.8	Same	174	1	0.3	Same
Centura St Anthony North Hospital	Westminster	66	1	1.2	Same	103	3	2.4	Same	82	0	0	Same
Centura St Francis MC	Colorado Springs	117	2	1.3	Same	135	2	1.3	Same	194	2	0.8	Same
Centura St Mary Corwin MC	Pueblo	144	3	1.5	Same	124	1	0.6	Same	148	2	1	Same
Centura St Thomas More Hospital	Canon City	42	2	4.3	Same	39	1	2	Same	29	3	8.1	Worse
Children's Hospital Colorado	Aurora	33	0	0	Same	19	***	***	***	29	1	1.3	Same
Colorado Plains MC	Fort Morgan	25	0	0	Same	32	0	0	Same	29	0	0	Same
Community Hospital	Grand Junction	80	0	0	Same	62	1	1.2	Same	77	1	0.8	Same
Delta County Memorial Hospital	Delta	62	2	2.6	Same	54	1	1.4	Same	52	0	0	Same
Denver Health MC	Denver	114	2	1.1	Same	111	4	2	Same	90	0	0	Same
East Morgan County Hospital	Brush	9	***	***	***	0	***	***	***	11	***	***	***
Estes Park MC	Estes Park	7	***	***	***	10	***	***	***	9	***	***	***
Exempla Good Samaritan MC	Lafayette	314	0	0	Better	302	5	1.3	Same	422	4	0.8	Same
Exempla Lutheran MC	Wheat Ridge	171	6	2.5	Same	161	6	2.3	Same	169	2	0.8	Same

Surgical Site Infections in Hip Replacement Procedures in Hospitals and Ambulatory Surgery Centers: August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Exempla St Joseph Hospital	**Denver**	708	4	0.5	Same	674	4	0.5	Same	838	2	0.2	Better
Family Health West Hospital	**Grand Junction**	2	***	***	***	1	***	***	***	0	***	***	***
Grand River MC	**Rifle**	5	***	***	***	11	***	***	***	13	***	***	***
Gunnison Valley Hospital	**Gunnison**	1	***	***	***	6	***	***	***	10	***	***	***
Heart of the Rockies Regional MC	**Salida**	10	***	***	***	21	0	0	Same	40	0	0	Same
Longmont United Hospital	**Longmont**	121	0	0	Same	133	1	0.5	Same	128	0	0	Same
McKee MC	**Loveland**	161	2	1.2	Same	150	1	0.6	Same	157	0	0	Same
MC of Aurora	**Aurora**	180	3	1.3	Same	260	4	1.3	Same	219	2	0.7	Same
MC of the Rockies	**Loveland**	107	0	0	Same	134	4	2.5	Same	131	4	2.1	Same
Memorial Hospital Central	**Colorado Springs**	310	1	0.3	Same	252	1	0.4	Same	225	4	1.2	Same
Memorial Hospital North	**Colorado Springs**	135	1	0.8	Same	131	1	0.8	Same	168	0	0	Same
Mercy Regional MC	**Durango**	94	0	0	Same	75	0	0	Same	86	0	0	Same
Montrose Memorial Hospital	**Montrose**	67	0	0	Same	68	0	0	Same	77	0	0	Same
North Colorado MC	**Greeley**	146	3	1.6	Same	186	0	0	Same	246	2	0.6	Same
North Suburban MC	**Thornton**	64	0	0	Same	89	1	0.8	Same	36	0	0	Same
OrthoColorado Hospital at St. Anthony Medical Campus	**Lakewood**	387	4	1.2	Same	454	1	0.2	Same	533	3	0.6	Same
Orthopedic Center of the Rockies ASC	**Ft Collins**	169	0	0	Same	200	0	0	Same	239	0	0	Same
Pagosa Springs MC	**Pagosa Springs**	1	***	***	***	1	***	***	***	6	***	***	***
Parker Adventist Hospital	**Parker**	103	2	1.6	Same	132	2	1	Same	155	1	0.5	Same
Parkview MC	**Pueblo**	208	4	1.4	Same	216	2	0.6	Same	183	0	0	Same
Pikes Peak Regional Hospital	**Woodland Park**	7	***	***	***	4	***	***	***	5	***	***	***
Platte Valley MC	**Brighton**	10	0	0	Same	14	***	***	***	33	0	0	Same
Poudre Valley Hospital	**Ft Collins**	562	2	0.3	Same	482	4	0.7	Same	511	6	0.9	Same
Presbyterian St Luke's MC	**Denver**	322	2	0.6	Same	366	2	0.5	Same	344	10	1.9	Same
Rocky Mountain Surgery Center ASC	**Englewood**	1	***	***	***	0	***	***	***	0	***	***	***

Surgical Site Infections in Hip Replacement Procedures in Hospitals and Ambulatory Surgery Centers: August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Rose MC	**Denver**	347	3	0.8	Same	305	3	1	Same	325	2	0.6	Same
San Luis Valley Regional MC	**Alamosa**	26	1	2.9	Same	34	0	0	Same	32	2	3.8	Same
Sky Ridge MC	**Lone Tree**	637	8	1.2	Same	803	13	1.6	Same	764	6	0.7	Same
Southwest Memorial Hospital	**Cortez**	22	1	3.7	Same	15	***	***	***	12	***	***	***
St Anthony Summit MC	**Frisco**	1	***	***	***	1	***	***	***	0	***	***	***
St Mary's Hospital	**Grand Junction**	265	0	0	Same	275	1	0.3	Same	292	0	0	Same
Sterling Regional MC	**Sterling**	36	0	0	Same	30	2	4.6	Same	34	0	0	Same
Surgical Center at Premier	**Colorado Springs**	Not yet operating				Not yet operating				39	0	0	Same
Swedish MC	**Englewood**	282	5	1.4	Same	275	1	0.3	Same	253	3	0.9	Same
The Memorial Hospital	**Craig**	7	***	***	***	1	***	***	***	1	***	***	***
University of Colorado Hospital	**Aurora**	255	1	0.2	Same	262	3	0.7	Same	317	3	0.5	Same
Vail Valley MC	**Vail**	11	***	***	***	7	***	***	***	1	0	0	Same
Valley View Hospital	**Glenwood Springs**	58	0	0	Same	41	0	0	Same	69	0	0	Same
Wray Community Hospital	**Wray**	6	***	***	***	10	***	***	***	4	***	***	***
Yampa Valley MC	**Steamboat Springs**	74	0	0	Same	58	0	0	Same	52	0	0	Same

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.
National comparison based on the indirect adjustment of modeled risk factors for each procedure type.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
Source: National Health Care Safety Network (NHSN) Database.

TABLE 11: Number of Surgical Site Infections and Standardized Infection Ratios for Knee Replacement (Total or Partial) in Hospitals and Ambulatory Surgery Centers (ASC) – Colorado, August 2011-July 2014

Surgical Site Infections in Knee Replacement Procedures in Hospitals and ASCs: August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	115	0	0	Same	128	0	0	Same	185	0	0	Same
Arkansas Valley Regional MC	La Junta	36	0	0	Same	21	0	0	Same	25	0	0	Same
Aspen Valley Hospital	Aspen	27	0	0	Same	65	1	1.9	Same	122	1	1.1	Same
Boulder Community Hospital	Boulder	268	5	2.1	Same	246	1	0.4	Same	381	4	1.3	Same
Castle Rock Adventist Hospital	Castle Rock	Not yet operating				Not yet operating				106	0	0	Same
Centura Avista Adventist Hospital	Louisville	168	1	0.8	Same	159	3	2.5	Same	167	0	0	Same
Centura Littleton Adventist Hospital	Littleton	141	1	0.6	Same	177	0	0	Same	194	1	0.5	Same
Centura Penrose St Francis Health	Colorado Springs	479	5	1.1	Same	455	2	0.5	Same	455	1	0.2	Same
Centura Porter Adventist Hospital	Denver	978	7	0.8	Same	1,082	7	0.7	Same	1,143	5	0.5	Same
Centura St Anthony Hospital	Lakewood	138	2	1.3	Same	132	0	0	Same	137	3	1.6	Same
Centura St Anthony North Hospital	Westminster	77	1	1.3	Same	90	2	2.5	Same	74	1	1.6	Same
Centura St Francis MC	Colorado Springs	243	8	3.2	Worse	318	0	0	Same	448	3	0.7	Same
Centura St Mary Corwin MC	Pueblo	212	1	0.5	Same	222	2	1	Same	238	1	0.5	Same
Centura St Thomas More Hospital	Canon City	73	1	1.7	Same	73	0	0	Same	61	0	0	Same
Children's Hospital Colorado	Aurora	8	***	***	***	5	***	***	***	4	***	***	***
Colorado Plains MC	Fort Morgan	57	0	0	Same	52	1	2.3	Same	44	0	0	Same
Community Hospital	Grand Junction	132	1	0.7	Same	118	0	0	Same	120	0	0	Same
Delta County Memorial Hospital	Delta	113	0	0	Same	77	0	0	Same	107	1	1.1	Same
Denver Health MC	Denver	133	2	1.4	Same	133	0	0	Same	173	1	0.5	Same
East Morgan County Hospital	Brush	14	***	***	***	0	***	***	***	22	1	5.6	Same
Estes Park MC	Estes Park	8	***	***	***	2	***	***	***	8	***	***	***
Exempla Good Samaritan MC	Lafayette	520	3	0.6	Same	494	4	0.9	Same	713	3	0.5	Same
Exempla Lutheran MC	Wheat Ridge	117	2	1.6	Same	124	1	0.8	Same	146	2	1.6	Same
Exempla St Joseph Hospital	Denver	835	3	0.4	Same	904	3	0.3	Better	1,010	5	0.5	Same
Family Health West Hospital	Grand Junction	10	***	***	***	2	***	***	***	0	***	***	***

Surgical Site Infections in Knee Replacement Procedures in Hospitals and ASCs: August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Grand River MC	**Rifle**	8	***	***	***	2	***	***	***	18	***	***	***
Gunnison Valley Hospital	**Gunnison**	3	***	***	***	7	***	***	***	8	***	***	***
Heart of the Rockies Regional MC	**Salida**	15	***	***	***	50	0	0	Same	56	2	2.9	Same
Middle Park Medical Center of Kremmling	**Kremmling**	1	***	***	***	1	***	***	***	0	***	***	***
Longmont Surgery Center ASC	**Longmont**	1	***	***	***	0	***	***	***	0	***	***	***
Longmont United Hospital	**Longmont**	243	2	0.9	Same	248	0	0	Same	253	1	0.4	Same
Loveland Surgery Center ASC	**Loveland**	1	***	***	***	0	***	***	***	1	***	***	***
McKee MC	**Loveland**	285	3	1.4	Same	301	2	0.9	Same	305	2	0.9	Same
MC of Aurora	**Aurora**	297	2	0.6	Same	360	6	1.5	Same	290	3	0.9	Same
MC of the Rockies	**Loveland**	116	1	0.6	Same	151	4	2.2	Same	178	3	1.6	Same
Memorial Hospital Central	**Colorado Springs**	491	1	0.2	Same	359	4	1.2	Same	215	3	1.3	Same
Memorial Hospital North	**Colorado Springs**	393	3	0.9	Same	364	5	1.6	Same	444	1	0.2	Same
Mercy Regional MC	**Durango**	149	0	0	Same	164	1	0.8	Same	135	0	0	Same
Montrose Memorial Hospital	**Montrose**	140	0	0	Same	137	1	1	Same	115	1	1	Same
North Colorado MC	**Greeley**	306	5	1.4	Same	283	1	0.3	Same	326	3	0.8	Same
North Suburban MC	**Thornton**	151	1	0.7	Same	145	5	3.1	Same	86	1	1.4	Same
Ortho Colorado Hospital at St. Anthony Medical Campus	**Lakewood**	893	2	0.3	Same	1049	11	1.4	Same	1,117	3	0.4	Same
Orthopedic Center of the Rockies ASC	**Ft Collins**	349	0	0	Same	408	0	0	Same	446	0	0	Same
Pagosa Springs MC	**Pagosa Springs**	0	***	***	***	0	***	***	***	7	***	***	***
Parker Adventist Hospital	**Parker**	167	0	0	Same	200	2	0.7	Same	254	1	0.4	Same
Parkview MC	**Pueblo**	368	9	2.3	Worse	335	2	0.5	Same	355	0	0	Better
Pikes Peak Regional Hospital	**Woodland Park**	44	0	0	Same	27	0	0	Same	26	0	0	Same
Platte Valley MC	**Brighton**	67	2	3.9	Same	63	3	6	Worse	71	0	0	Same
Poudre Valley Hospital	**Ft Collins**	986	4	0.4	Same	988	7	0.7	Same	1,034	5	0.5	Same

Surgical Site Infections in Knee Replacement Procedures in Hospitals and ASCs: August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Presbyterian St Luke's MC	**Denver**	362	1	0.3	Same	354	4	1	Same	370	5	0.9	Same
Rocky Mountain Surgery Center ASC	**Englewood**	5	***	***	***	0	***	***	***	0	***	***	***
Rose MC	**Denver**	556	5	0.9	Same	595	3	0.5	Same	551	2	0.4	Same
Rose Surgical Center	**Denver**	0	***	***	***	0	***	***	***	18	***	***	***
San Luis Valley Regional MC	**Alamosa**	25	0	0	Same	38	1	2.7	Same	31	0	0	Same
Sky Ridge MC	**Lone Tree**	716	5	0.7	Same	741	6	0.9	Same	818	9	1.2	Same
Skyline Surgery Center ASC	**Loveland**	5	***	***	***	0	***	***	***	9	***	***	***
Southwest Memorial Hospital	**Cortez**	55	0	0	Same	25	1	5.0	Same	28	0	0	Same
St Anthony Summit MC	**Frisco**	65	0	0	Same	36	0	0	Same	47	0	0	Same
St Mary's Hospital	**Grand Junction**	333	1	0.3	Same	326	0	0	Same	381	0	0	Better
Sterling Regional MC	**Sterling**	45	0	0	Same	37	0	0	Same	41	0	0	Same
Surgery Center At Lutheran ASC	**Wheat Ridge**	1	***	***	***	12	***	***	***	28	0	0	Same
Surgical Center at Premier ASC	**Colorado Springs**	4	***	***	***	37	0	***	***	89	0	0	Same
Swedish MC	**Englewood**	326	2	0.6	Same	431	4	1	Same	406	4	1	Same
The Memorial Hospital	**Craig**	29	0	0	Same	9	***	***	***	2	***	***	***
University of Colorado Hospital	**Aurora**	331	8	1.8	Same	294	2	0.5	Same	338	6	1.3	Same
Vail Valley MC	**Vail**	132	0	0	Same	141	0	0	Same	139	1	1	Same
Valley View Hospital	**Glenwood Springs**	115	1	1	Same	91	0	0	Same	105	0	0	Same
Wray Community Hospital	**Wray**	20	0	0	Same	19	***	***	***	9	***	***	***
Yampa Valley MC	**Steamboat Springs**	111	1	1	Same	84	0	0	Same	112	0	0	Same

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.
National comparison based on the indirect adjustment of modeled risk factors for each procedure type.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
Source: National Health Care Safety Network (NHSN) Database.

ABDOMINAL PROCEDURES

BACKGROUND

The surgeries presented in this section are hernia repairs, colon surgeries and hysterectomies (abdominal and vaginal). These surgeries can be performed as inpatient or outpatient procedures.

A hernia procedure involves the repair of a hernia or bulging of internal organs or tissues that protrude through an abnormal opening in the muscle wall. Reportable NHSN hernia procedures include inguinal, femoral, umbilical or anterior abdominal wall repairs.

In Colorado, hernia repairs were removed from mandatory reporting in acute care hospitals based on new national reporting requirements by the Centers for Medicare and Medicaid Services (CMS). To fulfill CMS reimbursement requirements, facilities nationwide began reporting certain colon procedures on January 1, 2013. Since facilities already were reporting colon surgeries to fulfill CMS requirements, Colorado removed the mandatory reporting of hernia repairs in hospitals, replacing it with colon surgeries. Hernia repair remains a reportable surgery for ASC and colon procedures only are reportable for hospitals.

Colon surgeries involve the excision of abnormal tissue in the large intestines. The intestines, which are muscular tubes that extend from the end of the stomach to the rectum, carry food, products of digestion and bacteria that help break down food in the digestive process. Since the intestines house bacteria, colon surgeries have a high risk for contamination and infection.

Hysterectomies are reported both by hospitals and ASC and involve the surgical removal of the uterus and occasionally, one or both fallopian tubes and/or ovaries. Indications for hysterectomy typically include benign fibroid tumors, cancerous tumors, uterine prolapse (uterus slips down into the vagina), endometriosis (cells from the uterine lining grow outside the uterus, causing pain and bleeding), chronic pelvic pain, and others.

Number of procedures, number of infections and SIRs for hernia repairs, colon surgeries and hysterectomies are presented in Tables 12-15 below.

HERNIA REPAIRS

Hernia procedures involve the repair of bulging internal organs or tissues that protrude through an abnormal opening in the muscle wall. Reportable NHSN hernia procedures include inguinal, femoral, umbilical or anterior abdominal wall repairs. Since January 2013, hospitals no longer are required to report hernia repairs; therefore, hernia repairs are only reported for ambulatory surgery centers (ASC).

Individually, all ASC had hernia SSI rates similar to the national average. When examining all ASC combined, the state aggregate had a better hernia SSI rate than the national average all three reporting years.

RESULTS

Table 12 shows facility specific data for SSI attributed to hernia repairs performed in ASC from August 1, 2013 through July 31, 2014, along with historical data for two previous reporting years.

Thirty-three ASC reported 6,029 **hernia repairs** this past year; 19 ASC reported zero SSI. Individually, all ASC had hernia SSI rates similar to the national average. However, when examining all ASC combined (see Table 5), the statewide hernia SSI rate has been better than the national average all three reporting years.

TABLE 12: Number of Surgical Site Infections and Standardized Infection Ratios for Hernia Repairs in Ambulatory Surgery Centers - Colorado, August 2011 – July 2014

Surgical Site Infections in Hernia Repairs in Ambulatory Surgery Centers (ASC): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
ASC Durango at Mercy MC	Durango	146	0	0	Same	91	0	0	Same	90	0	0	Same
Aberdeen Ambulatory Surgical Center	Pueblo	3	***	***	***	4	***	***	***	1	***	***	***
Arkansas Valley Surgery Center	Canon City	82	0	0	Same	92	0	0	Same	90	0	0	Same
Audubon Ambulatory Surgery Center	Colorado Springs	38	1	5.9	Same	18	***	***	***	38	0	0	Same
Audubon Ambulatory Surgery Center at St. Francis	Colorado Springs	561	3	1.1	Same	475	0	0	Same	552	1	0.4	Same
Black Canyon Surgical Center	Montrose	39	0	0	Same	37	0	0	Same	33	0	0	Same
Centrum Surgical Center	Greenwood Village	7	***	***	***	13	***	***	***	20	0	0	Same
Children's North Surgery Center	Broomfield	56	0	0	Same	73	0	0	Same	71	0	0	Same
Clear Creek Surgery Center	Wheat Ridge	386	2	1.1	Same	369	0	0	Same	311	0	0	Same
Crown Point Surgery Center	Parker	244	0	0	Same	312	0	0	Same	307	0	0	Same
Denver Midtown Surgery Center	Denver	273	0	0	Same	179	0	0	Same	215	0	0	Same
First Choice Outpatient Surgery Center at Community Hospital	Grand Junction	83	1	2.5	Same	78	1	2.8	Same	55	0	0	Same
Grand Valley Surgical Center	Grand Junction	213	1	0.9	Same	182	0	0	Same	199	1	1	Same
Harmony Ambulatory Surgery Center	Ft Collins	536	4	1.5	Same	486	2	0.9	Same	498	3	1.2	Same
Kaiser Permanente Ambulatory Surgery Center	Denver	685	1	0.3	Same	676	5	1.5	Same	708	1	0.3	Same
Lincoln Surgery Center	Parker	55	0	0	Same	55	0	0	Same	19	***	***	***
Longmont Surgery Center	Longmont	153	0	0	Same	126	0	0	Same	104	1	2.1	Same
Midvalley Ambulatory Surgery Center LLC	Basalt	6	***	***	***	4	***	***	***	8	***	***	***
North Suburban Surgery Center	Thornton	178	0	0	Same	193	0	0	Same	181	0	0	Same
Parkwest Surgery Center	Pueblo	9	***	***	***	11	***	***	***	9	***	***	***
Peak One Surgery Center	Frisco	71	2	6.1	Same	60	0	0	Same	56	0	0	Same
Pueblo Surgery Center	Pueblo	18	***	***	***	7	***	***	***	1	***	***	***

Surgical Site Infections in Hernia Repairs in Ambulatory Surgery Centers (ASC): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Red Rocks Surgery Center	**Golden**	115	0	0	Same	254	0	0	Same	327	0	0	Same
Renewal Surgery Center	**Lone Tree**	2	***	***	***	3	***	***	***	0	***	***	***
Rocky Mountain Surgery Center	**Englewood**	355	0	0	Same	279	0	0	Same	354	0	0	Same
Rose Surgical Center	**Denver**	418	0	0	Same	399	0	0	Same	456	0	0	Same
Sky Ridge Surgical Center	**Lone Tree**	221	0	0	Same	330	0	0	Same	506	0	0	Same
Skyline Surgery Center	**Loveland**	179	0	0	Same	128	0	0	Same	161	0	0	Same
Southwest Colorado Surgical Center	**Cortez**	13	***	***	***	13	***	***	***	14	***	***	***
Summit View Surgery Center	**Littleton**	321	0	0	Same	346	0	0	Same	323	1	0.7	Same
Surgery Center At Lutheran	**Wheat Ridge**	58	0	0	Same	5	***	***	***	1	***	***	***
Surgery Center Of Ft Collins	**Ft Collins**	15	***	***	***	13	***	***	***	10	***	***	***
Surgical Center at Premier	**Colorado Springs**	66	0	0	Same	83	0	0	Same	74	0	0	Same
UCH Memorial Surgery Center At Printers Park	**Colorado Springs**	15	***	***	***	132	1	1.6	Same	237	0	0	Same

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.
National comparison based on the indirect adjustment of modeled risk factors for each procedure type.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
Source: National Health Care Safety Network (NHSN) Database.

COLON SURGERIES

Colon surgeries involve the small and large intestines, muscular tubes that extend from the end of the stomach to the rectum. The intestines carry bacteria as part of the digestive process, and therefore have a high risk for contamination and infection. Facilities began reporting colon procedures on January 1, 2013, as part of the Centers for Medicare and Medicaid Services (CMS) reporting requirements.

When combining data across all Colorado hospitals, the statewide aggregate rate for colon SSI has been better than the national average in all reporting periods.

RESULTS

Table 13 shows facility specific data for SSI attributed to colon surgeries performed from January 1, 2013 through July 31, 2014.

Fifty-five hospitals reported 4,707 **colon surgeries** this past year and three hospitals reported zero SSI. Seven hospitals had colon SSI rates better than the national average, and one hospital had a rate worse than the national average; all others had rates similar to the national average. When combining data across all Colorado hospitals (Table 5), the statewide aggregate rate for colon SSI has been better than the national average in all reporting periods.

TABLE 13: Number of Surgical Site Infections and Standardized Infection Ratios for Colon Surgeries in Hospitals - Colorado, January 2012 – July 2014

Surgical Site Infections in Colon Procedures in Hospitals: January 1, 2013 – July 31, 2014													
Health Facility and City		January 2012-July 2012*				August 2012-July 2013				August 2013-July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional MC	La Junta	8	***	***	***	12	***	***	***	12	***	***	***
Aspen Valley Hospital	Aspen	7	***	***	***	6	***	***	***	6	***	***	***
Boulder Community Hospital	Boulder	39	1	0.5	Same	75	4	0.9	Same	102	4	0.7	Same
Boulder Community Hospital-Foothills	Boulder	2	***	***	***	14	***	***	***	2	***	***	***
Castle Rock Adventist Hospital	Castle Rock	Not yet operating				Not yet operating				23	2	1.5	Same
Centura Avista Adventist Hospital	Louisville	18	***	***	***	39	2	0.9	Same	32	1	0.5	Same
Centura Littleton Adventist Hospital	Littleton	60	2	0.6	Same	102	4	0.7	Same	83	4	0.8	Same
Centura Penrose St Francis Health	Colorado Springs	257	12	0.9	Same	214	7	0.6	Same	211	19	1.7	Worse
Centura Porter Adventist Hospital	Denver	60	6	1.7	Same	82	4	0.9	Same	67	3	0.8	Same
Centura St Anthony Hospital	Lakewood	114	6	0.9	Same	128	13	1.7	Same	115	5	0.8	Same
Centura St Anthony North Hospital	Westminster	42	3	1.4	Same	75	4	1	Same	86	3	0.6	Same
Centura St Francis MC	Colorado Springs	57	2	0.7	Same	68	2	0.6	Same	91	1	0.2	Same
Centura St Mary Corwin MC	Pueblo	42	0	0	Same	52	3	1	Same	53	3	0.9	Same
Centura St Thomas More Hospital	Canon City	25	0	0	Same	44	4	1.7	Same	47	4	1.6	Same
Children's Hospital Colorado	Aurora	26	***	***	***	74	1			106	2	0.3	Same
Colorado Plains MC	Fort Morgan	16	***	***	***	19	***	***	***	15	***	***	***
Community Hospital	Grand Junction	22	0	0	Same	41	4	1.8	Same	52	2	0.7	Same
Delta County Memorial Hospital	Delta	23	0	0	Same	28	2	1.2	Same	37	2	1	Same
Denver Health MC	Denver	162	9	0.8	Same	147	18	1.6	Same	122	14	1.6	Same
East Morgan County Hospital	Brush	2	***	***	***	0	***	***	***	4	***	***	***
Estes Park MC	Estes Park	2	***	***	***	0	***	***	***	0	***	***	***

Surgical Site Infections in Colon Procedures in Hospitals: January 1, 2013 – July 31, 2014													
Health Facility and City		January 2012-July 2012*				August 2012-July 2013				August 2013-July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Exempla Good Samaritan MC	Lafayette	120	6	0.9	Same	181	3	0.3	Better	166	6	0.6	Same
Exempla Lutheran MC	Wheat Ridge	111	6	1	Same	152	5	0.6	Same	172	6	0.5	Same
Exempla St Joseph Hospital	Denver	287	3	0.2	Better	363	17	0.9	Same	337	6	0.3	Better
Grand River MC	Rifle	6	***	***	***	4	***	***	***	0	***	***	***
Gunnison Valley Hospital	Gunnison	2	***	***	***	0	***	***	***	1	***	***	***
Heart of the Rockies Regional MC	Salida	6	***	***	***	16	***	***	***	14	***	***	***
Longmont United Hospital	Longmont	69	6	1.7	Same	98	3	0.5	Same	100	3	0.5	Same
McKee MC	Loveland	30	3	2	Same	76	2	0.5	Same	82	5	1.2	Same
MC of Aurora	Aurora	91	3	0.6	Same	122	10	1.5	Same	110	3	0.5	Same
MC of the Rockies	Loveland	118	0	0	Better	127	0	0	Better	163	0	0	Better
Memorial Hospital Central	Colorado Springs	66	2	0.5	Same	143	6	0.7	Same	211	9	0.7	Same
Memorial Hospital North	Colorado Springs	35	3	1.8	Same	56	0	0	Same	55	4	1.5	Same
Mercy Regional MC	Durango	24	0	0	Same	46	0	0	Same	41	0	0	Same
Montrose Memorial Hospital	Montrose	21	0	0	Same	41	2	0.8	Same	30	0	0	Same
Mt San Rafael Hospital	Trinidad	1	***	***	***	1	***	***	***	0	***	***	***
North Colorado MC	Greeley	108	5	0.8	Same	149	10	1.1	Same	156	9	1	Same
North Suburban MC	Thornton	38	1	0.4	Same	62	1	0.3	Same	75	1	0.2	Same
Pagosa Springs MC	Pagosa Springs	1	***	***	***	1	***	***	***	6	***	***	***
Parker Adventist Hospital	Parker	73	2	0.5	Same	128	4	0.5	Same	126	2	0.3	Same
Parkview MC	Pueblo	90	4	0.9	Same	110	4	0.7	Same	124	4	0.6	Same
Pikes Peak Regional Hospital	Woodland Park	5	***	***	***	8	***	***	***	4	***	***	***
Platte Valley MC	Brighton	18	***	***	***	33	4	2.1	Same	23	2	1.7	Same
Poudre Valley Hospital	Ft Collins	167	10	1.1	Same	169	5	0.6	Same	161	4	0.5	Same
Presbyterian St Luke's MC	Denver	90	1	0.2	Same	131	2	0.3	Same	107	1	0.2	Better
Prowers MC	Lamar	1	***	***	***	1	***	***	***	4	***	***	***
Rose MC	Denver	133	4	0.6	Same	192	4	0.4	Same	228	2	0.2	Better
San Luis Valley Regional MC	Alamosa	16	***	***	***	15	***	***	***	12	***	***	***
Sky Ridge MC	Lone Tree	115	6	1	Same	150	9	1.1	Same	168	3	0.3	Better

Surgical Site Infections in Colon Procedures in Hospitals: January 1, 2013 – July 31, 2014													
Health Facility and City		January 2012-July 2012*				August 2012-July 2013				August 2013-July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Southwest Memorial Hospital	**Cortez**	16	***	***	***	0	***	***	***	18	***	***	***
St Anthony Summit MC	**Frisco**	6	***	***	***	6	***	***	***	8	***	***	***
St Mary's Hospital	**Grand Junction**	130	4	0.7	Same	184	3	0.3	Same	200	2	0.2	Better
Sterling Regional MC	**Sterling**	6	***	***	***	17	***	***	***	11	***	***	***
Swedish MC	**Englewood**	224	12	1	Same	296	15	0.9	Same	328	12	0.7	Same
University of Colorado Hospital	**Aurora**	112	1	0.1	Better	222	6	0.3	Better	294	3	0.1	Better
Vail Valley MC	**Vail**	20	0	0	Same	15	***	***	***	9	***	***	***
Valley View Hospital	**Glenwood Springs**	19	***	***	***	26	3	1.9	Same	46	3	1.1	Same
Wray Community Hospital	**Wray**	3	***	***	***	0	***	***	***	0	***	***	***
Yampa Valley MC	**Steamboat Springs**	3	***	***	***	9	***	***	***	8	***	***	***

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.
National comparison based on the indirect adjustment of modeled risk factors for each procedure type.
*Hospitals began reporting colon procedures January, 2012.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
Source: National Health Care Safety Network (NHSN) Database.

HYSTERECTOMIES

Hysterectomies have traditionally been performed by making a large abdominal incision to access the uterus and surrounding anatomy. This traditional, open abdominal surgery often causes significant pain, threat to surrounding organs and nerves, long recovery periods and a higher risk of bleeding and infection[8]. Based on these negative outcomes, surgeons began using less invasive techniques such as vaginal hysterectomies. In traditional vaginal hysterectomies, the procedure is completed through the vagina with no abdominal incisions. Compared to traditional, open abdominal hysterectomies, vaginal hysterectomies have been shown to result in fewer surgical complications and infections[9]. This report presents SSI for both abdominal and vaginal hysterectomies.

When numbers for all facilities are combined, the state's abdominal hysterectomy SSI rate has been better than the national average for the last three reporting years.

RESULTS

Tables 14 and 15 show facility specific data for SSI attributed to abdominal and vaginal hysterectomies performed from Aug. 1, 2011 through July 31, 2014.

Of the 56 hospitals reporting VHYS, 24 reported zero SSI this past year. One hospital's SSI rate was worse than the national average and all others had rates similar to the national average.

Fifty-five hospitals reported 6,794 **abdominal hysterectomies (AHYS)** in this reporting period. Of those facilities, 12 reported zero infections. One facility had an SSI rate better than the national average, and all others had SSI rates similar to the national average. However, when numbers for all facilities are combined (Table 5), the state's AHYS SSI rate has been better than the national average for the last three reporting years.

Fifty-six hospitals and four ASC reported 2,943 and 46 **vaginal hysterectomies (VHYS)**, respectively. Of the 55 hospitals reporting VHYS, 24 reported zero SSI this past year. One hospital's SSI rate was worse than the national average and all others had rates similar to the national average. Four ASC reported 46 VHYS and all reported zero infections.

Table 14: Number of Surgical Site Infections and Standardized Infection Ratios for Abdominal Hysterectomies in Hospitals and Ambulatory Surgery Centers – Colorado, August 2011 – July 2014

Surgical Site Infections in Abdominal Hysterectomies in Hospitals and **Ambulatory Surgery Centers** (ASC; **In- and Outpatient Combined): August 1, 2011 – July 31, 2014**													
Health Facility and City		**August 2011- July 2012**				**August 2012- July 2013**				**August 2013- July 2014**			
		No. of Procedures	**No. of Infections**	**SIR**	**National Comparison**	**No. of Procedures**	**No. of Infections**	**SIR**	**National Comparison**	**No. of Procedures**	**No. of Infections**	**SIR**	**National Comparison**
Animas Surgical Hospital	**Durango**	17	***	***	***	13	***	***	***	8	***	***	***
Arkansas Valley Regional MC	**La Junta**	4	***	***	***	5	***	***	***	7	***	***	***
Aspen Valley Hospital	**Aspen**	3	***	***	***	6	***	***	***	10	***	***	***
Boulder Community Hospital	**Boulder**	17	***	***	***	37	2	2.6	Same	31	0	0	Same
Boulder Community Hospital-Foothills	**Boulder**	36	0	0	Same	28	0	0	Same	4	***	***	***
Castle Rock Adventist Hospital	**Castle Rock**	Not yet operating				Not yet operating				15	***	***	***
Centura Avista Adventist Hospital	**Louisville**	67	0	0	Same	49	3	2.8	Same	84	0	0	Same
Centura Littleton Adventist Hospital	**Littleton**	77	0	0	Same	155	1	0.4	Same	109	0	0	Same
Centura Penrose St Francis Health	**Colorado Springs**	189	8	2	Same	234	3	0.7	Same	329	6	1	Same
Centura Porter Adventist Hospital	**Denver**	165	0	0	Same	111	1	0.5	Same	104	0	0	Same
Centura St Anthony Hospital	**Lakewood**	18	***	***	***	27	0	0	Same	26	1	2.3	Same
Centura St Anthony North Hospital	**Westminster**	13	***	***	***	13	***	***	***	16	***	***	***
Centura St Francis MC	**Colorado Springs**	224	2	0.5	Same	325	3	0.6	Same	357	6	1.1	Same
Centura St Mary Corwin MC	**Pueblo**	94	0	0	Same	146	1	0.4	Same	139	2	0.8	Same
Centura St Thomas More Hospital	**Canon City**	15	***	***	***	13	***	***	***	33	0	0	Same
Colorado Plains MC	**Fort Morgan**	40	0	0	Same	38	1	1.6	Same	19	***	***	***
Community Hospital	**Grand Junction**	17	***	***	***	13	***	***	***	26	1	2.2	Same
Crown Point Surgery Center ASC	**Parker**	0	***	***	***	4	***	***	***	0	***	***	***
Delta County Memorial Hospital	**Delta**	14	***	***	***	58	0	0	Same	51	1	1	Same

Surgical Site Infections in Abdominal Hysterectomies in Hospitals and Ambulatory Surgery Centers (ASC; In- and Outpatient Combined): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Denver Health MC	**Denver**	70	2	1.5	Same	70	1	0.6	Same	78	4	2.2	Same
Estes Park MC	**Estes Park**	1	***	***	***	2	***	***	***	1	***	***	***
Exempla Good Samaritan MC	**Lafayette**	175	2	0.8	Same	180	0	0	Same	219	3	0.9	Same
Exempla Lutheran MC	**Wheat Ridge**	305	7	1.6	Same	320	4	0.9	Same	342	2	0.4	Same
Exempla St Joseph Hospital	**Denver**	280	5	0.9	Same	455	11	1.1	Same	480	3	0.3	Better
Grand River MC	**Rifle**	10	***	***	***	6	***	***	***	7	***	***	***
Gunnison Valley Hospital	**Gunnison**	15	***	***	***	5	***	***	***	14	***	***	***
Heart of the Rockies Regional MC	**Salida**	11	***	***	***	1	***	***	***	0	***	***	***
Longmont United Hospital	**Longmont**	29	0	0	Same	150	2	0.8	Same	204	4	1.4	Same
McKee MC	**Loveland**	162	0	0	Same	233	0	0	Same	187	1	0.3	Same
MC of Aurora	**Aurora**	109	0	0	Same	97	1	0.7	Same	93	0	0	Same
MC of the Rockies	**Loveland**	61	0	0	Same	45	0	0	Same	88	1	0.7	Same
Melissa Memorial	**Holyoke**	0	***	***	***	1	***	***	***	0	***	***	***
Memorial Hospital Central	**Colorado Springs**	162	3	1.2	Same	272	4	0.9	Same	224	2	0.6	Same
Memorial Hospital North	**Colorado Springs**	139	4	2.2	Same	132	0	0	Same	107	1	0.7	Same
Mercy Regional MC	**Durango**	104	0	0	Same	106	1	0.8	Same	67	0	0	Same
Montrose Memorial Hospital	**Montrose**	119	0	0	Same	120	2	1.3	Same	100	2	1.4	Same
Mt San Rafael Hospital	**Trinidad**	2	***	***	***	6	***	***	***	6	***	***	***
North Colorado MC	**Greeley**	170	2	0.9	Same	221	1	0.3	Same	192	2	0.7	Same
North Suburban MC	**Thornton**	155	2	0.8	Same	149	0	0	Same	184	0	0	Same
Parker Adventist Hospital	**Parker**	123	1	0.5	Same	131	1	0.5	Same	145	1	0.4	Same
Parkview MC	**Pueblo**	121	1	0.7	Same	126	0	0	Same	145	0	0	Same
Pikes Peak Regional Hospital	**Woodland Park**	1	***	***	***	0	***	***	***	0	***	***	***
Platte Valley MC	**Brighton**	22	1	3.2	Same	26	1	2.3	Same	27	1	1.9	Same
Poudre Valley Hospital	**Ft Collins**	255	2	0.5	Same	264	1	0.3	Same	300	2	0.5	Same
Presbyterian St Luke's MC	**Denver**	60	1	0.8	Same	64	2	1.6	Same	84	0	0	Same
Prowers MC	**Lamar**	31	0	0	Same	12	***	***	***	15	***	***	***

Surgical Site Infections in Abdominal Hysterectomies in Hospitals and Ambulatory Surgery Centers (ASC; In- and Outpatient Combined): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Rose MC	**Denver**	393	6	1	Same	491	5	0.7	Same	497	4	0.6	Same
San Luis Valley Regional MC	**Alamosa**	7	***	***	***	11	***	***	***	19	***	***	***
Sky Ridge MC	**Lone Tree**	216	5	1.2	Same	409	6	0.8	Same	454	3	0.4	Same
Southwest Memorial	**Cortez**	1	***	***	***	15	***	***	***	24	1	***	***
St Anthony Summit MC	**Frisco**	24	0	0	Same	16	***	***	***	13	***	***	***
St Mary's Hospital	**Grand Junction**	265	1	0.2	Same	299	1	0.2	Same	207	3	0.8	Same
Sterling Regional MC	**Sterling**	5	***	***	***	1	***	***	***	3	***	***	***
Swedish MC	**Englewood**	451	4	0.5	Same	541	7	0.8	Same	582	6	0.7	Same
The Memorial Hospital	**Craig**	3	***	***	***	0	***	***	***	1	***	***	***
University of Colorado Hospital	**Aurora**	199	0	0	Better	225	4	0.6	Same	316	4	0.5	Same
Vail Valley MC	**Vail**	13	***	***	***	12	***	***	***	25	0	0	Same
Valley View Hospital	**Glenwood Springs**	14	***	***	***	15	***	***	***	35	1	1.3	Same
Yampa Valley MC	**Steamboat Springs**	11	***	***	***	24	0	0	Same	27	0	0	Same

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.
National comparison based on the indirect adjustment of modeled risk factors for each procedure type.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
Source: National Health Care Safety Network (NHSN) Database.

TABLE 15: Number of Surgical Site Infections and Standardized Infection Ratios for Vaginal Hysterectomies in Hospitals and Ambulatory Surgery Centers - Colorado, August 2011 – July 2014

Surgical Site Infections in Vaginal Hysterectomies in Hospitals and Ambulatory Surgery Centers (ASC; In- and Outpatient Combined): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	Durango	27	0	0	Same	29	0	0	Same	26	0	0	Same
Arkansas Valley Regional Medical Center	La Junta	0	***	***	***	0	***	***	***	2	***	***	***
Aspen Valley Hospital	Aspen	19	***	***	***	13	***	***	***	17	***	***	***
Audubon Ambulatory Surgery Center ASC	Colorado Springs	1	***	***	***	1	***	***	***	0	***	***	***
Boulder Community Hospital	Boulder	35	1	4.7	Same	1	***	***	***	2	***	***	***
Boulder Community Hospital-Foothills	Boulder	13	***	***	***	19	***	***	***	2	***	***	***
Castle Rock Adventist Hospital	Castle Rock	Not yet operating								10	***	***	***
Centura Avista Adventist Hospital	Louisville	34	1	***	***	37	0	0	Same	15	***	***	***
Centura Littleton Adventist Hospital	Littleton	150	0	0	Same	80	0	0	Same	115	1	1.4	Same
Centura Penrose St Francis Health	Colorado Springs	78	2	5.2	Same	30	0	0	Same	31	0	0	Same
Centura Porter Adventist Hospital	Denver	121	2	3	Same	75	1	2.4	Same	42	0	0	Same
Centura St Anthony Hospital	Lakewood	0	***	***	***	3	***	***	***	3	***	***	***
Centura St Anthony North Hospital	Westminster	64	0	0	Same	29	0	0	Same	31	0	0	Same
Centura St Francis MC	Colorado Springs	305	3	1.8	Same	138	1	1.4	Same	153	2	2.5	Same
Centura St Mary Corwin MC	Pueblo	62	0	0	Same	23	0	0	Same	43	0	0	Same
Centura St Thomas More Hospital	Canon City	13	***	***	***	34	0	0	Same	30	1	5.8	Same
Colorado Plains MC	Fort Morgan	22	0	0	Same	19	***	***	***	11	***	***	***
Community Hospital	Grand Junction	80	1	2.5	Same	58	0	0	Same	69	1	2.8	Same
Crown Point Surgery	Parker	0	***	***	***	0	***	***	***	10	***	***	***
Delta County Memorial Hospital	Delta	22	0	0	Same	8	***	***	***	10	***	***	***

Surgical Site Infections in Vaginal Hysterectomies in Hospitals and Ambulatory Surgery Centers (ASC; In- and Outpatient Combined): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Denver Health MC	Denver	59	3	3.9	Same	65	1	1.1	Same	67	1	1.1	Same
Estes Park MC	Estes Park	7	***	***	***	12	***	***	***	7	***	***	***
Exempla Good Sam	Lafayette	138	2	2.7	Same	115	1	1.6	Same	132	0	0	Same
Exempla Lutheran MC	Wheat Ridge	190	3	2.9	Same	164	0	0	Same	169	2	2.2	Same
Exempla St Joseph Hospital	Denver	311	1	0.2	Same	216	3	0.9	Same	179	0	0	Same
Grand River MC	Rifle	11	***	***	***	32	0	0	Same	39	0	0	Same
Heart of the Rockies Regional MC	Salida	2	***	***	***	3	***	***	***	3	***	***	***
Longmont United Hospital	Longmont	83	1	2.1	Same	34	1	4.7	Same	34	1	4.1	Same
McKee MC	Loveland	119	1	1.4	Same	2	***	***	***	2	***	***	***
MC of Aurora	Aurora	89	0	0	Same	49	2	6.9	Same	41	0	0	Same
MC of the Rockies	Loveland	11	***	***	***	9	***	***	***	50	0	0	Same
Memorial Hospital Central	Colorado Springs	205	1	0.9	Same	176	0	0	Same	129	0	0	Same
Memorial Hospital North	Colorado Springs	195	2	2	Same	188	1	1	Same	196	0	0	Same
Mercy Regional MC	Durango	27	0	0	Same	16	***	***	***	14	***	***	***
Montrose Memorial Hospital	Montrose	34	0	0	Same	24	0	0	Same	38	0	0	Same
Mt San Rafael Hospital	Trinidad	10	***	***	***	11	***	***	***	15	***	***	***
North Colorado MC	Greeley	154	1	1.2	Same	66	0	0	Same	17	***	***	***
North Suburban MC	Thornton	70	0	0	Same	25	0	0	Same	37	0	0	Same
Pagosa Springs MC	Pagosa Springs	0	***	***	***	1	***	***	***	3	***	***	***
Parker Adventist	Parker	67	4	10.1	Worse	102	2	2.9	Same	110	0	0	Same
Parkview MC	Pueblo	200	0	0	Same	200	0	0	Same	216	2	0.7	Same
Peak One Surgery Center ASC	Frisco	13	***	***	***	16	***	***	***	2	***	***	***
Pikes Peak Regional Hospital	Woodland Park	6	***	***	***	1	***	***	***	0	***	***	***
Platte Valley MC	Brighton	31	0	0	Same	33	3	17.8	Worse	39	0	0	Same
Poudre Valley Hospital	Ft Collins	141	5	2.7	Same	95	1	0.8	Same	89	0	0	Same
Presbyterian St Luke's	Denver	38	1	2.1	Same	57	0	0	Same	35	0	0	Same
Prowers MC	Lamar	1	***	***	***	5	***	***	***	8	***	***	***

Surgical Site Infections in Vaginal Hysterectomies in Hospitals and Ambulatory Surgery Centers (ASC; In- and Outpatient Combined): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011- July 2012				August 2012- July 2013				August 2013- July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Pueblo Surgery Center	Pueblo	0	***	***	***	4	***	***	***	0	***	***	***
Rose MC	Denver	173	1	0.4	Same	99	0	0	Same	114	0	0	Same
San Luis Valley Regional MC	Alamosa	34	0	0	Same	18	***	***	***	38	0	0	Same
Sky Ridge MC	Lone Tree	321	4	2.1	Same	161	2	2.2	Same	132	0	0	Same
Southwest Memorial Hospital	Cortez	1	***	***	***	12	***	***	***	9	***	***	***
St Anthony Summit MC	Frisco	5	***	***	***	8	***	***	***	17	***	***	***
St Mary's Hospital	Grand Junction	130	0	0	Same	126	2	1.2	Same	127	3	1.7	Same
Sterling Regional MC	Sterling	9	***	***	***	6	***	***	***	6	***	***	***
Surgery Center At Lutheran	Wheat Ridge	2	***	***	***	8	***	***	***	2	***	***	***
Surgery Center Of Ft Collins	Ft Collins	16	***	***	***	15	***	***	***	28	0	0	Same
Swedish MC	Englewood	210	0	0	Same	167	2	2.3	Same	168	2	2.3	Same
The Memorial Hospital	Craig	4	***	***	***	0	***	***	***	0	***	***	***
University of Colorado Hospital	Aurora	141	2	0.9	Same	113	0	0	Same	101	0	0	Same
UCH Memorial Outpatient Surgery Center At Printers Park	Colorado Springs	4	***	***	***	0	***	***	***	4	***	***	***
Vail Valley MC	Vail	17	***	***	***	16	***	***	***	24	0	0	Same
Valley View Hospital	Glenwood Springs	56	1	2.9	Same	34	1	4.5	Same	20	0	0	Same
Wray Community Hospital	Wray	1	***	***	***	0	***	***	***	0	***	***	***
Yampa Valley MC	Steamboat Springs	31	0	0	Same	34	0	0	Same	32	2	8.9	Worse

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.
National comparison based on the indirect adjustment of modeled risk factors for each procedure type.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
Source: National Health Care Safety Network (NHSN) Database.

BREAST PROCEDURES

BACKGROUND

Breast procedures for purposes of surveillance and reporting into NHSN involve those procedures with at least one incision to the skin in either male or female patients performed in either inpatient or outpatient surgery locations. There are 36 types breast procedures that qualify in this category and can include an open biopsy of the breast, local excision of a lesion of the breast, insertion and removal of breast implants and radical mastectomies to name a few.

RESULTS

Tables 16 and 17, show facility-specific data for SSI attributed to **breast procedures** in hospitals and ASC, respectively, performed from August 1, 2011 through July 31, 2014.

When numbers from all hospitals were combined, the statewide breast SSI rate has been worse than the national average for the last 3 reporting years.

In this past reporting year, 62 hospitals reported 9,899 breast surgeries; 20 hospitals reported zero infections. Four hospitals (two more than last year) had breast SSI rates worse than the national average; all other hospitals had SSI rates similar to the national average. When numbers from all hospitals were combined (Table 5), the statewide breast SSI rate has been worse than the national average for the last 3 reporting years.

Thirty-two ASC reported 5,476 breast surgeries. Thirteen ASC reported zero SSI. This reporting year, one ASC has a breast SSI rate worse than the national average. All other ASC had breast SSI rates similar to the national average.

This reporting year, one ASC had a breast SSI rate worse than the national average.

TABLE 16: Number of Surgical Site Infections and Standardized Infection Ratios for Breast Surgeries in Hospitals – Colorado, August 1, 2011 – July 31, 2014

Surgical Site Infections in Breast Procedures in Hospitals (In- and Outpatient Combined): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Animas Surgical Hospital	**Durango**	123	0	0	Same	159	0	0	Same	159	0	0	Same
Arkansas Valley Regional MC	**La Junta**	4	***	***	***	7	***	***	***	4	***	***	***
Aspen Valley Hospital	**Aspen**	25	0	0	Same	20	0	0	Same	10	***	***	***
Boulder Community Hospital	**Boulder**	171	1	0.7	Same	111	0	0	Same	249	8	2.9	Worse
Boulder Community Hospital-Foothills	**Boulder**	351	3	1	Same	234	0	0	Same	11	***	***	***
Castle Rock Adventist Hospital	**Castle Rock**	Not yet operating								56	0	0	Same
Centura Avista Adventist Hospital	**Louisville**	160	1	0.7	Same	154	4	2.5	Same	227	1	0.5	Same
Centura Littleton Adventist Hospital	**Littleton**	282	5	3.8	Worse	307	4	2.7	Same	301	1	0.7	Same
Centura Penrose St Francis Health	**Colorado Springs**	101	0	0	Same	158	0	0	Same	380	0	0	Same
Centura Porter Adventist Hospital	**Denver**	564	3	1.4	Same	348	6	3	Worse	116	2	2.6	Same
Centura St Anthony Hospital	**Lakewood**	169	6	6.5	Worse	234	7	5.3	Worse	342	0	0	Same
Centura St Anthony North Hospital	**Westminster**	49	2	2.8	Same	44	1	1.7	Same	41	1	1.4	Same
Centura St Francis MC	**Colorado Springs**	135	0	0	Same	317	1	0.3	Same	147	0	0	Same
Centura St Mary Corwin MC	**Pueblo**	130	1	0.7	Same	149	2	1.2	Same	172	1	0.6	Same
Centura St Thomas More Hospital	**Canon City**	36	0	0	Same	14	***	***	***	21	0	0	Same
Children's Hospital Colorado	**Aurora**	17	***	***	***	7	***	***	***	11	***	***	***
Colorado Plains MC	**Fort Morgan**	11	***	***	***	10	***	***	***	14	***	***	***
Community Hospital	**Grand Junction**	80	1	1.2	Same	97	1	0.9	Same	79	1	1.2	Same
Delta County Memorial Hospital	**Delta**	47	2	4	Same	45	0	0	Same	50	0	0	Same
Denver Health MC	**Denver**	197	2	0.6	Same	167	3	1	Same	144	3	1.1	Same

Surgical Site Infections in Breast Procedures in Hospitals (In- and Outpatient Combined): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
East Morgan County Hospital	Brush	7	***	***	***	19	***	***	***	14	***	***	***
Estes Park MC	Estes Park	1	***	***	***	0	***	***	***	0	***	***	***
Exempla Good Samaritan MC	Lafayette	470	6	2.8	Worse	503	4	1.4	Same	506	5	1.9	Same
Exempla Lutheran MC	Wheat Ridge	464	4	1.7	Same	430	4	1.9	Same	443	9	4.1	Worse
Exempla St Joseph Hospital	Denver	618	4	1	Same	923	8	1.4	Same	1,030	12	1.5	Same
Family Health West Hospital	Grand Junction	12	***	***	***	54	0	0	Same	25	0	0	Same
Grand River MC	Rifle	16	***	***	***	20	0	0	Same	41	0	0	Same
Gunnison Valley Hospital	Gunnison	1	***	***	***	0	***	***	***	0	***	***	***
Heart of the Rockies Regional MC	Salida	14	***	***	***	18	***	***	***	32	0	0	Same
Kit Carson Memorial Hospital	Burlington	0	***	***	***	1	***	***	***	1	***	***	***
Longmont United Hospital	Longmont	55	0	0	Same	93	2	2.1	Same	70	1	1.6	Same
McKee MC	Loveland	160	0	0	Same	143	1	0.8	Same	139	0	0	Same
MC of Aurora	Aurora	324	1	0.8	Same	283	3	2.6	Same	259	3	2.8	Same
MC of the Rockies	Loveland	246	1	0.3	Same	266	3	0.9	Same	242	2	0.6	Same
Memorial Hospital Central	Colorado Springs	43	0	0	Same	27	0	0	Same	39	2	9	Worse
Memorial Hospital North	Colorado Springs	192	4	1.7	Same	288	2	0.7	Same	255	2	0.7	Same
Mercy Regional MC	Durango	96	1	1	Same	132	0	0	Same	110	0	0	Same
Montrose Memorial Hospital	Montrose	55	0	0	Same	80	1	1.2	Same	83	2	2.3	Same
Mt San Rafael Hospital	Trinidad	10	***	***	***	2	***	***	***	0	***	***	***
North Colorado MC	Greeley	156	0	0	Same	135	0	0	Same	179	3	3.6	Same
North Suburban MC	Thornton	37	0	0	Same	49	0	0	Same	58	0	0	Same
Pagosa Springs MC	Pagosa Springs	0	***	***	***	2	***	***	***	2	***	***	***
Parker Adventist Hospital	Parker	76	0	0	Same	47	1	1.2	Same	75	4	3.8	Worse
Parkview MC	Pueblo	222	1	1.2	Same	230	2	2.2	Same	189	0	0	Same
Pioneers MC	Meeker	4	***	***	***	0	***	***	***	3	***	***	***

Surgical Site Infections in Breast Procedures in Hospitals (In- and Outpatient Combined): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Platte Valley MC	**Brighton**	96	1	1.2	Same	69	1	1.7	Same	65	0	0	Same
Poudre Valley Hospital	**Ft Collins**	138	2	2	Same	193	3	2.1	Same	240	4	2.4	Same
Presbyterian St Luke's MC	**Denver**	440	0	0	Same	480	2	1.1	Same	533	0	0	Same
Prowers MC	**Lamar**	1	***	***	***	0	***	***	***	5	***	***	***
Rose MC	**Denver**	1,523	8	1.1	Same	1,413	9	1.4	Same	1,537	3	0.4	Same
San Luis Valley Regional MC	**Alamosa**	36	0	0	Same	30	0	0	Same	42	0	0	Same
Sky Ridge MC	**Lone Tree**	313	6	0.8	Same	496	4	0.5	Same	562	8	0.6	Same
Southeast Colorado Hospital	**Springfield**	2	***	***	***	2	***	***	***	1	***	***	***
Southwest Memorial Hospital	**Cortez**	2	***	***	***	3	***	***	***	1	***	***	***
Spanish Peaks Regional Health Center	**Walsenburg**	3	***	***	***	0	***	***	***	3	***	***	***
St Anthony Summit MC	**Frisco**	3	***	***	***	4	***	***	***	1	***	***	***
St Mary's Hospital	**Grand Junction**	177	1	1	Same	186	1	1.1	Same	145	1	1.4	Same
Sterling Regional MC	**Sterling**	7	***	***	***	20	2	6.7	Same	17	***	***	***
Swedish MC	**Englewood**	49	1	1.1	Same	102	0	0	Same	98	0	0	Same
The Memorial Hospital	**Craig**	5	***	***	***	0	***	***	***	0	***	***	***
University of Colorado Hospital	**Aurora**	298	7	1.1	Same	415	2	0.2	Better	435	4	0.5	Same
Vail Valley MC	**Vail**	143	0	0	Same	102	3	2.7	Same	92	2	2	Same
Valley View Hospital	**Glenwood Springs**	141	0	0	Same	138	0	0	Same	73	0	0	Same
Wray Community Hospital	**Wray**	1	***	***	***	2	***	***	***	1	***	***	***
Yampa Valley MC	**Steamboat Springs**	18	***	***	***	28	0	0	Same	28	0	0	Same
Yuma District Hospital	**Yuma**	6	***	***	***	4	***	***	***	5	***	***	***

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.
National comparison based on the indirect adjustment of modeled risk factors for each procedure type.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
Source: National Health Care Safety Network (NHSN) Database.

Table 17: Number of Surgical Site Infections and Standardized Infection Ratios Breast Surgeries in Ambulatory Surgery Centers – Colorado, August 2011 –July 2014

Surgical Site Infections in Breast Procedures in ASCs (Outpatient): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
ASC Durango at Mercy MC	Durango	50	0	0	Same	15	***	***	***	15	***	***	***
Aberdeen Ambulatory Surgical Center	Pueblo	348	0	0	Same	354	0	0	Same	310	0	0	Same
Arkansas Valley Surgery Center	Canon City	6	***	***	***	8	***	***	***	4	***	***	***
Audubon Ambulatory Surgery Center	Colorado Springs	252	0	0	Same	83	0	0	Same	5	***	***	***
Audubon Ambulatory Surgery Center at St. Francis	Colo Springs	5	***	***	***	12	***	***	***	6	***	***	***
Avista Surgery Center	Boulder	432	1	0.5	Same	455	1	0.5	Same	491	4	2	Same
Black Canyon Surgical Center	Montrose	3	***	***	***	0	***	***	***	2	***	***	***
Boulder Medical Center	Boulder	30	0	0	Same	0	***	***	***	0	***	***	***
Centrum Surgical Center	Greenwood Village	516	1	0.4	Same	504	0	0	Same	456	2	1.2	Same
Clear Creek Surgery Center	Wheat Ridge	22	0	0	Same	13	***	***	***	16	***	***	***
Colorado Springs Surgery Center	Colorado Springs	134	0	0	Same	110	1	1.9	Same	161	1	1.3	Same
Crown Point Surgery Center	Parker	58	0	0	Same	126	0	0	Same	228	1	0.9	Same
Denver Midtown Surgery Center	Denver	73	0	0	Same	33	0	0	Same	22	0	0	Same
1st Choice Outpatient Surgery Center at Comm. Hosp.	Grand Junction	168	0	0	Same	129	0	0	Same	65	0	0	Same
Grand Valley Surgical Center	Grand Junction	254	2	1.6	Same	233	1	1	Same	300	2	1.3	Same
Harmony Ambulatory Surgery Center	Ft Collins	349	1	0.5	Same	372	3	1.2	Same	340	0	0	Same
Kaiser Permanente Ambulatory Surgery Center	Denver	258	3	2	Same	215	0	0	Same	202	1	0.9	Same
Longmont Surgery Center	Longmont	115	0	0	Same	115	0	0	Same	105	0	0	Same
Midvalley Ambulatory Surgery Center LLC	Basalt	0	***	***	***	2	***	***	***	0	***	***	***
North Suburban Surgery Center	Thornton	52	0	0	Same	31	0	0	Same	35	0	0	Same
Park Meadows Cosmetic Surgery	Lone Tree	197	1	0.8	Same	213	1	0.8	Same	218	0	0	Same

Surgical Site Infections in Breast Procedures in ASCs (Outpatient): August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Parkwest Surgery Center	**Pueblo**	2	***	***	***	6	***	***	***	4	***	***	***
Peak One Surgery Center	**Frisco**	2	***	***	***	0	***	***	***	0	***	***	***
Pueblo Surgery Center	**Pueblo**	16	***	***	***	14	***	***	***	27	0	0	Same
Red Rocks Surgery Center	**Golden**	119	0	0	Same	133	0	0	Same	66	0	0	Same
Renewal Surgery Center	**Lone Tree**	535	0	0	Same	205	0	0	Same	Did not report			
Rocky Mountain Surgery Center	**Englewood**	5	***	***	***	3	***	***	***	4	***	***	***
Rose Surgical Center	**Denver**	205	0	0	Same	171	0	0	Same	151	0	0	Same
Sky Ridge Surgical Center	**Lone Tree**	2	***	***	***	1	***	***	***	1	***	***	***
Skyline Surgery Center	**Loveland**	26	0	0	Same	131	0	0	Same	170	0	0	Same
Southwest Colorado Surgical Center	**Cortez**	2	***	***	***	4	***	***	***	1	***	***	***
Summit View Surgery Center	**Littleton**	48	1	5.2	Same	68	0	0	Same	123	1	1.8	Same
Surgery Center At Lutheran	**Wheat Ridge**	129	0	0	Same	133	2	3.5	Same	81	0	0	Same
Surgery Center Of Ft Collins	**Ft Collins**	111	0	0	Same	162	2	1.7	Same	129	1	1	Same
Surgical Center At Premier	**Colorado Springs**	586	0	0	Same	603	0	0	Same	357	0	0	Same
UCH Memorial Surgery Center At Printers Park	**Colorado Springs**	503	9	3.4	Worse	590	4	1.2	Same	621	11	3.4	Worse

The standardized infection ratio (SIR) is the ratio of observed to expected infections adjusted for procedure risk factors. National comparison based on the indirect adjustment of modeled risk factors for each procedure type.

*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.

Infections for facilities performing less than 20 procedures per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.

Source: National Health Care Safety Network (NHSN) Database.

CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS OVERVIEW

BACKGROUND

Central line associated bloodstream infections (CLABSI) are associated with specific intravascular catheters or central lines that must be in place at the time of, or within 48 hours before the onset of the infection. A central line is an intravascular catheter (tube in a vein or artery) that terminates at or close to the heart or in one of the great vessels (e.g., aorta, superior vena cava). A peripheral line is a similar tube in a vein or artery that does not enter a great vessel, is a smaller diameter tube, and is typically used for shorter periods of intravenous access. Both central lines and peripheral lines can be used to infuse fluids or medications, withdraw blood or monitor fluid volume in patients. However, central lines are typically placed when intravenous access is needed for longer time periods, larger volumes of fluids, or access for dialysis is needed. An umbilical catheter (i.e., a tube placed in the umbilical cord) is a central vascular catheter inserted through the umbilical artery or vein in a neonate (infant $\leq$ 30 days old). Central lines can be either permanent or temporary. Permanent lines are those that are tunneled under the skin before entering a great vessel. These can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled.

All patients with central lines are at risk for CLABSI. However, certain groups are at higher risk for infection: elderly, neonates, dialysis patients, patients with weak immune systems (e.g., cancer patients, transplant patients), diabetics and patients with burn injuries[10-12].

Colorado requires that all adult critical care units, neonatal critical care units Level II/III and III, long-term acute care hospitals (LTAC), and inpatient rehabilitation hospitals and wards report CLABSI data into NHSN.

Every CLABSI data table below lists all Colorado hospitals and hospital unit(s) reporting central line use, their cities, number of central line days per year, number of infections, SIRs, and comparisons to national infection rates. The number of central line days is the total number of days a central line was in place for patients in the unit during the reporting period (for example, if 3 patients each had a central line for 10 days, the number of central line days is 30). The three categories summarizing how a Colorado facility compares to the national infection rate for that unit are:

1. Statistically lower infection rate than the national rate (**better**);
2. Statistically similar infection rate as the national rate (**same)**; or
3. Statistically higher infection rate than the national rate (**worse**).

ADULT CRITICAL CARE UNITS

Adult critical care units (CCU) report central line data by facility type, central line type and unit type. This differentiation enables fairer comparisons between health facilities by accounting for differences in care and patients' risk for infection that impact infection rates.

Hospitals identify their CCU by counting the type of patients cared for in the unit. For instance, if a medical CCU serves non-surgical patients and the majority of their critical care patients are non-surgical, that facility would have a medical CCU according to the NHSN definitions.

RESULTS

Table 18 shows facility specific data for **CLABSI** attributed to adult critical care units from August 1, 2011 through July 31, 2014.

No hospital had rates worse than the national average, compared to one hospital last year and two the year before.

Sixty-one adult critical care units in 47 Colorado hospitals reported 110,506 central line days in the last reporting year. Of the 61 hospital units, 28 reported zero CLABSI. This year, one hospital had CLABSI rates better than the national average and all others had rates similar to national rates. No hospital had rates worse than the national average, compared to one hospital last year and two the year before.

TABLE 18: Number of Central Line-Associated Bloodstream Infections in Adult Critical Care Units – Colorado, August 2011 – July 2014

Central Line-Associated Blood Stream Infections (CLABSI): August 1, 2011 – July 31, 2014														
Health Facility, City, Unit Type			August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
			No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison
Arkansas Valley Regional MC	**La Junta**	**MICU/SICU**	128	0	0	Same	61	0	0	Same	198	0	0	Same
Aspen Valley Hospital	**Aspen**	**MICU/SICU**	39	***	***	***	54	0	0	Same	25	***	***	***
Boulder Community Hospital	**Boulder**	**MICU/SICU**	1,756	0	0	Same	1,933	0	0	Same	1,926	0	0	Same
Boulder Community Hospital-Foothills	**Boulder**	**MICU**	206	0	0	Same	0	***	***	***	Closed			
Castle Rock Adventist	**Castle Rock**	**MICU**	Not yet operating				Not yet operating				463	0	0	Same
Centura Avista Adventist Hospital	**Louisville**	**MICU/SICU**	481	1	2.3	Same	613	0	0	Same	401	0	0	Same
Centura Littleton Adventist Hospital	**Littleton**	**MICU/SICU**	2,699	2	0.8	Same	2,787	2	0.8	Same	3,291	3	1	Same
Centura Penrose St Francis Health	**Colorado Springs**	**MICU/SICU**	3,428	5	1.6	Same	3,763	5	1.5	Same	3,922	2	0.6	Same
Centura Porter Adventist Hospital	**Denver**	**MICU/SICU**	4,167	5	1.3	Same	3,661	2	0.6	Same	4,043	0	0	Same
Centura St Anthony Hospital	**Lakewood**	**MICU**	2,281	4	1.6	Same	2,073	0	0	Same	2,401	1	0.4	Same
		MICU/SICU	1,442	0	0	Same	1,737	3	1.9	Same	1,895	2	1.2	Same
		NEURO ICU	2,205	2	0.8	Same	1,753	2	1	Same	1,931	2	0.9	Same
		CSICU	2,136	4	2.3	Same	2,074	0	0	Same	1,839	0	0	Same
		TraumaICU	2,205	2	0.6	Same	1,744	1	0.4	Same	1,572	4	1.6	Same
Centura St Anthony North Hospital	**Westminster**	**MICU**	2,445	2	0.6	Same	499	1	1.5	Same	0	***	***	***
		MICU/SICU	1,533	0	0	Same	1,335	1	0.4	Same	1,668	2	1	Same
Centura St Francis MC	**Colorado Springs**	**MICU/SICU**	337	0	0	Same	415	1	2.7	Same	431	0	0	Same
Centura St Mary Corwin MC	**Pueblo**	**MICU/SICU**	2,154	3	1.2	Same	1,658	2	1	Same	1,591	1	0.5	Same
Centura St Thomas More Hospital	**Canon City**	**MICU/SICU**	129	0	0	Same	106	0	0	Same	117	1	9.5	Same
Colorado Plains MC	**Fort Morgan**	**MICU/SICU**	60	0	0	Same	36	***	***	***	19	***	***	***
Community Hospital	**Grand Junction**	**MICU**	358	0	0	Same	268	0	0	Same	271	0	0	Same
		MICU/SICU	0	***	***	***	69	0	0	Same	0	***	***	***
Delta County Memorial Hospital	**Delta**	**MICU/SICU**	436	0	0	Same	372	0	0	Same	416	0	0	Same
Denver Health MC	**Denver**	**MICU**	3,415	0	0	Better	3,196	5	1.2	Same	3,335	3	0.7	Same

Central Line-Associated Blood Stream Infections (CLABSI): August 1, 2011 – July 31, 2014														
Health Facility, City, Unit Type			August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
			No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison
		TraumaICU	2,447	1	0.3	Same	2,794	0	0	Better	2,352	4	1.1	Same
Exempla Good Samaritan MC	Lafayette	MICU/SICU	2,228	0	0	Same	2,010	0	0	Same	1,562	1	0.7	Same
Exempla Lutheran MC	Wheat Ridge	MICU/SICU	4,864	6	1.4	Same	4,821	1	0.2	Same	3,691	0	0	Same
Exempla St Joseph Hospital	Denver	MICU/SICU	4,399	2	0.4	Same	3,698	0	0	Better	3,303	0	0	Better
Heart of the Rockies Regional MC	Salida	MICU/SICU	11	***	***	***	23	***	***	***	25	***	***	***
Longmont United Hospital	Longmont	MICU/SICU	3,130	1	0.4	Same	2,429	0	0	Same	2,671	0	0	Same
McKee MC	Loveland	MICU/SICU	710	0	0	Same	817	0	0	Same	714	0	0	Same
MC of Aurora	Aurora	MICU/SICU	4,715	2	0.5	Same	4,793	5	1.2	Same	5,012	8	1.8	Same
MC of the Rockies-South Wing	Loveland	MICU/SICU	3,667	2	1	Same	4,021	0	0	Same	4,028	2	0.8	Same
Memorial Hospital Central	Colorado Springs	MICU/SICU	5,179	2	0.4	Same	4,963	3	0.7	Same	4,759	3	0.7	Same
Memorial Hospital North	Colorado Springs	MICU/SICU	285	0	0	Same	268	0	0	Same	309	0	0	Same
Mercy Regional MC	Durango	MICU/SICU	1,135	2	1.5	Same	1,019	0	0	Same	959	0	0	Same
Montrose Memorial Hospital	Montrose	MICU/SICU	252	0	0	Same	345	0	0	Same	341	0	0	Same
North Colorado MC	Greeley	MICU/SICU	1,889	3	1.8	Same	2,338	0	0	Same	2,506	0	0	Same
North Suburban MC	Thornton	MICU/SICU	2,900	2	0.8	Same	2,382	4	1.9	Same	2,191	0	0	Same
Parker Adventist Hospital	Parker	MICU/SICU	1,688	1	0.7	Same	1,475	1	0.8	Same	1,401	0	0	Same
Parkview MC	Pueblo	MICU/SICU	1,470	11	7.5	Worse	1,579	3	2.1	Same	1,634	4	2.7	Same
		NEURO ICU	1,157	3	2.4	Same	1,147	1	0.8	Same	1,246	0	0	Same
Platte Valley MC	Brighton	MICU	867	0	0	Same	444	0	0	Same	290	0	0	Same
Poudre Valley Hospital	Fort Collins	MICU/SICU	1,466	1	0.6	Same	1,365	0	0	Same	1,446	0	0	Same
Presbyterian St Luke's MC	Denver	MICU/SICU	2,475	0	0	Same	2,215	2	0.8	Same	2,051	1	0.4	Same
Rose MC	Denver	MICU/SICU	2,068	0	0	Same	2,004	0	0	Same	1,754	1	0.5	Same
San Luis Valley Regional MC	Alamosa	MICU/SICU	249	0	0	Same	156	0	0	Same	235	0	0	Same
Sky Ridge MC	Lone Tree	MICU/SICU	2,601	2	0.9	Same	2,593	1	0.4	Same	2,302	0	0	Same
Southwest Memorial Hospital	Cortez	MICU/SICU	180	0	0	Same	119	0	0	Same	132	0	0	Same
St Anthony Summit	Frisco	MICU/SICU	79	0	0	Same	41	***	***	***	34	***	***	***

Central Line-Associated Blood Stream Infections (CLABSI): August 1, 2011 – July 31, 2014														
Health Facility, City, Unit Type			August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
			No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison
MC														
St Mary's Hospital	**Grand Junction**	**CSICU**	5,025	4	1	Same	5,869	1	0.2	Same	5,573	5	1.1	Same
Sterling Regional MC	**Sterling**	**MICU/SICU**	191	0	0	Same	197	0	0	Same	120	0	0	Same
Swedish MC	**Englewood**	**MICU/SICU**	4,565	10	3.6	Same	4,657	7	1.3	Same	4,185	6	1.2	Same
		NEURO ICU	1,245	0	0	Same	2,165	3	1.3	Same	2,502	1	0.4	Same
		TraumaICU	430	0	0	Same	720	2	1.7	Same	995	3	1.9	Same
University of Colorado Hospital	**Aurora**	**Burn ICU**	1,538	5	1	Same	1,263	5	1.2	Same	1,532	10	1.9	Same
		CCU	1,152	1	0.8	Same	1,352	4	2.7	Same	1,575	3	1.7	Same
		MICU	3,703	7	1.5	Same	3,771	10	2.7	Worse	4,562	11	1.9	Same
		NEURO ICU	2,755	8	2.9	Worse	3,410	3	0.8	Same	4,643	9	1.8	Same
		CSICU	Not yet operating				Not yet operating				3,137	0	0	Same
		SICU	3,720	6	1.3	Same	4,445	8	1.5	Same	2,517	6	2	Same
Vail Valley MC	**Vail**	**MICU/SICU**	213	0	0	Same	87	0	0	Same	148	0	0	Same
Valley View Hospital	**Glenwood Springs**	**MICU/SICU**	221	0	0	Same	255	0	0	Same	295	0	0	Same
Yampa Valley MC	**Steamboat Springs**	**MICU/SICU**	14	***	***	***	22	***	***	***	19	***	***	***

Note: CL=Central Line; SIR=standardized infection ratio, the ratio of observed to expected infections adjusted for procedure risk factors.
Note: MICU=Medical intensive care unit; SICU=Surgical intensive care unit; ICU= intensive care unit; CCU=Critical care unit; CSICU=Cardiothoracic surgical intensive care unit.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities with fewer than 50 central line days per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2012.
Source: National Health Care Safety Network (NHSN) Database.

LONG-TERM ACUTE CARE HOSPITALS

A long-term acute care hospital (LTAC) is a specialty care hospital that cares for patients with complex medical conditions requiring intense, specialized treatment for at least 25 days. These patients often transfer from critical care units in traditional hospitals. Patients in these facilities have a higher severity of illness often with multi-system complications posing a challenge for infection control.

LTAC report infection data for patients with either permanent or temporary central lines. As previously noted, permanent lines are those that are tunneled and can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled. Permanent lines are commonly used in LTAC patients and historically have had lower rates of infection than temporary lines.

This past year, nine LTAC reported 32,750 central line days; three hospitals reported zero CLABSI.

RESULTS

Table 19 shows facility specific data for CLABSI in LTAC. The table contains data from August 1, 2011 through July 31, 2014.

In Colorado this past year, nine LTAC reported 32,750 central line days; three LTAC reported zero CLABSI and all LTACs had rates the same as the national rates.

TABLE 19: Number of Central Line-Associated Bloodstream Infections in Long-Term Acute Care Hospitals – Colorado, August 2011 – July 2014

Central Line Associated Blood Stream Infections (CLABSI) in Long-Term Acute Care Hospitals: August 1, 2011 – July 31, 2014													
Health Facility and City		August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
		No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison
Advanced Care Hospital of Northern Colorado	**Johnstown**	4,018	7	1.7	Same	3,435	3	0.9	Same	3,295	0	0	Same
Colorado Acute Long Term Hospital	**Denver**	6,656	5	0.8	Same	5,902	7	1.2	Same	6,012	5	0.8	Same
Craig Hospital	**Englewood**	3,748	3	0.8	Same	3,283	3	0.9	Same	1,957	1	0.5	Same
Kindred Hospital	**Denver**	6,015	10	1.7	Same	5,540	10	1.8	Same	4,177	2	0.5	Same
Select Long Term Care Hospital	**Colorado Springs**	4,991	1	0.2	Better	4,070	0	0	Better	3,944	1	0.3	Same
Select Specialty Hospital South Campus	**Denver**	3,550	0	0	Better	2,641	1	0.4	Same	2,495	0	0	Same
Select Specialty Hospital	**Denver**	4,744	0	0	Better	3,278	0	0	Better	2,456	0	0	Same
Triumph Acute Long Term Care Hospital of Aurora	**Aurora**	4,398	9	2	Same	4,067	1	0.3	Same	3,458	1	0.3	Same
Vibra Long Term Acute Care Hospital	**Thornton**	6,085	3	0.5	Same	6,249	10	1.6	Same	4,956	4	0.8	Same

Note: CL=Central Line; SIR=standardized infection ratio, the ratio of observed to expected infections adjusted for procedure risk factors.
Note: MICU=Medical intensive care unit; SICU=Surgical intensive care unit; ICU= intensive care unit; CCU=Critical care unit; CSICU=Cardiothoracic surgical intensive care unit.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities with fewer than 50 central line days per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2012.
Source: National Health Care Safety Network (NHSN) Database.

REHABILITATION HOSPITALS AND INPATIENT REHABILITATION WARDS

Rehabilitation hospitals and inpatient rehabilitation wards care for patients who have lost function due to acute or chronic pain, musculoskeletal problems, stroke, brain or spinal cord dysfunction, catastrophic events resulting in complete or partial paralysis or need rehabilitation for other reasons. The goal for these areas is to evaluate, treat and restore optimal functioning of the patients physically and mentally.

Rehabilitation hospitals and wards report infection data for patients with either permanent or temporary central lines. Permanent lines are those that are tunneled under the skin before entering a great vessel. These can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled.

RESULTS

Table 20 shows facility specific data for CLABSI in rehab hospitals and wards. The table contains data from January 1, 2012 through July 31, 2014.

Five rehabilitation hospitals and 12 rehab wards reported 10,137 central line days this past year. All but two facilities reported zero infections and all facilities' rates were similar to the national average.

TABLE 20: Number of Central Line Associated Bloodstream Infections in Inpatient Rehabilitation Hospitals and Wards – Colorado, January 2012 – July 2014

Central Line Associated Blood Stream Infections (CLABSI) in Inpatient Rehabilitation Hospitals and Wards: January 1, 2012 – July 31, 2014													
Health Facility and City		January 2012 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
		No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison
Boulder Community Hospital	**Boulder**	283	0	0	Same	656	0	0	Same	506	0	0	Same
Centura Penrose St Francis Health	**Colo Springs**	284	0	0	Same	697	0	0	Same	426	0	0	Same
Centura Porter Adventist Hospital	**Denver**	490	1	3.4	Same	679	0	0	Same	728	0	0	Same
Centura St Anthony Hospital	**Lakewood**	252	0	0	Same	633	2	5.3	Same	475	0	0	Same
Centura St Mary Corwin MC	**Pueblo**	142	0	0	Same	202	0	0	Same	101	0	0	Same
Denver Health MC	**Denver**	240	0	0	Same	294	0	0	Same	270	1	6.2	Same
HealthSouth Rehabilitation Hospital of Colorado Springs	**Colo Springs**	255	0	0	Same	662	0	0	Same	701	0	0	Same
HealthSouth Rehabilitation Hospital of Denver	**Denver**	Not yet operating				59	0	0	Same	445	0	0	Same
Memorial Hospital Central	**Colo Springs**	478	0	0	Same	726	0	0	Same	1,027	0	0	Same
Montrose Memorial Hospital	**Montrose**	89	0	0	Same	136	0	0	Same	148	0	0	Same
North Colorado Medical Center	**Greeley**	49	***	***	***	No longer reporting							
Northern Colorado Rehabilitation Hospital	**Johnstown**	951	1	2.6	Same	911	0	0	Same	972	0	0	Same
Parkview Medical Center	**Pueblo**	248	0	0	Same	235	0	0	Same	350	0	0	Same
Poudre Valley Hospital	**Fort Collins**	125	0	0	Same	29	***	***	***	No longer reporting			
Spalding Rehabilitation Hospital	**Aurora**	1,211	0	0	Same	1,370	0	0	Same	932	0	0	Same
Spalding at PSL	**Denver**	851	0	0	Same	871	0	0	Same	1,146	0	0	Same
St Mary's Hospital	**Grand Junction**	371	0	0	Same	312	0	0	Same	46	***	***	***
Swedish MC	**Englewood**	284	0	0	Same	502	0	0	Same	515	0	0	Same
University of Colorado Hospital	**Aurora**	988	0	0	Same	1,169	0	0	Same	1,349	1	1.2	Same

Note: CL=Central Line; SIR=standardized infection ratio, the ratio of observed to expected infections adjusted for procedure risk factors.
Note: MICU=Medical intensive care unit; SICU=Surgical intensive care unit; ICU= intensive care unit; CCU=Critical care unit; CSICU=Cardiothoracic surgical intensive care unit.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities with fewer than 50 central line days per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2012.
Source: National Health Care Safety Network (NHSN) Database.

NEONATAL CRITICAL CARE UNITS

Neonatal critical care units (NCCU) provide intensive medical care for premature and ill newborn babies. Neonatal care is classified into four levels of care, and since Level 1 and II units care for healthy newborns, they are not required to report HAI. Colorado requires only level III and level II/III units to report CLABSI data. Level III NCCU provide personnel and equipment to ensure continuous life support and comprehensive care for extremely high-risk newborns with complex critical conditions. The designation between Level III and Level II/III is defined by the NHSN reporting guidelines. If a hospital unit does not separate infants receiving Level II care from those receiving Level III care, that NCCU is reported as a Level II/III.

NCCU infants will often have a central line inserted for several reasons: 1) their stay in the critical care unit can be prolonged; 2) they require intravenous nutrition and fluid replacement until their gastrointestinal system has matured or they can tolerate feedings by mouth; 3) their peripheral veins (those in the arms and legs) and scalp veins are small and unable to be used for fluids and medications for long periods of time; and 4) changing peripheral lines frequently can cause additional pain and stress for the infant and does not promote health. See above CLABSI section for descriptions of central lines versus peripheral lines. An umbilical catheter (i.e., a tube placed in the umbilical cord) is often inserted at birth as a means to provide nutrition while monitoring fluid balance. These catheters are a type of central line inserted through the umbilical artery or vein in a neonate (infant ≤ 30 days old).

Of 18 hospitals with NCCU, ten reported zero CLABSI and one had rates worse than national rates.

RESULTS

Table 21 shows the results of data collected in each NCCU from Aug. 1, 2011 through July 31, 2014.

Eighteen hospitals, including five Level III and 13 Level II/III NCCU, reported 19,246 central line days this past year. Of the 18 hospitals, ten reported zero CLABSI, one hospital infection rates worse than the national average, and all others had rates similar to national rates.

TABLE 21: Number of Central Line Associated Bloodstream Infections in Neonatal Critical Care Units – Colorado, August 1, 2011 – July 31, 2014

Central Line Associated Blood Stream Infections (CLABSI) in Neonatal Critical Care Units: August 1, 2011 – July 31, 2014														
Health Facility, City, NCCU Type/Level			August 2011 – July 2012				August 2012 – July 2013				August 2013 – July 2014			
			No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison
Centura Avista Adventist Hospital	**Louisville**	**II/III**	128	0	0	Same	165	0	0	Same	110	0	0	Same
Centura Littleton Adventist Hospital	**Littleton**	**III**	265	0	0	Same	156	0	0	Same	169	0	0	Same
Castle Rock Adventist	**Castle Rock**	**II/III**	Not yet operating				Not yet operating				3	***	***	***
Centura St Francis MC	**Colorado Springs**	**II/III**	1,487	1	0.7	Same	1,496	1	0.5	Same	1,431	1	0.6	Same
Children's Hospital Colorado	**Aurora**	**III**	4,153	6	1.5	Same	4,430	5	1.1	Same	4,894	4	0.8	Same
Children's Hospital Memorial	**Colorado Springs**	**II/III**	Not yet operating				751	3	3.0	Same	2,216	1	0.3	Same
Denver Health MC	**Denver**	**II/III**	734	1	1.5	Same	760	0	0	Same	910	4	5.5	Worse
Exempla Lutheran MC	**Wheat Ridge**	**II/III**	380	0	0	Same	227	0	0	Same	226	0	0	Same
Exempla St Joseph Hospital	**Denver**	**II/III**	926	4	3.5	Same	585	0	0	Same	1,126	3	2	Same
MC of Aurora	**Aurora**	**II/III**	100	1	13.9	Same	75	0	0	Same	58	0	0	Same
Memorial Hospital Central	**Colorado Springs**	**III**	2,294	5	1.7	Same	1,405	2	1.1	Same	No longer reporting			
Parker Adventist Hospital	**Parker**	**II/III**	222	0	0	Same	133	0	0	Same	85	0	0	Same
Poudre Valley Hospital	**Fort Collins**	**II/III**	1,032	1	1.4	Same	963	0	0	Same	755	0	0	Same
Presbyterian St Luke's MC	**Denver**	**III**	3,870	0	0	Better	4,434	4	0.7	Same	4,311	3	0.5	Same
Rose MC	**Denver**	**II/III**	375	0	0	Same	351	0	0	Same	257	1	2.9	Same
Sky Ridge MC	**Lone Tree**	**II/III**	113	0	0	Same	115	0	0	Same	188	0	0	Same
St Mary's Hospital	**Grand Junction**	**III**	745	0	0	Same	828	2	1.7	Same	622	0	0	Same
Swedish MC	**Englewood**	**II/III**	235	0	0	Same	296	0	0	Same	107	0	0	Same
University of Colorado Hospital	**Aurora**	**II/III**	2,260	1	0.3	Same	1,931	3	1.1	Same	1,778	0	0	Same

Note: CL=Central Line; SIR=standardized infection ratio, the ratio of observed to expected infections adjusted for procedure risk factors.
Note: MICU=Medical intensive care unit; SICU=Surgical intensive care unit; ICU= intensive care unit; CCU=Critical care unit; CSICU=Cardiothoracic surgical intensive care unit.
*** Indicates value not shown due to suppression of infection data, no national or historical rate available, or an expected infection count of less than 1.
Infections for facilities with fewer than 50 central line days per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.
National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2012.
Source: National Health Care Safety Network (NHSN) Database.

DIALYSIS RELATED-INFECTION OVERVIEW

BACKGROUND

According to the National Institute of Diabetes and Digestive and Kidney Diseases 2011 figures, more than 20 million people aged 20 and older have chronic kidney disease in the United States. In 2009, more than 871,000 patients in the United States received chronic dialysis treatment [13].

Surveillance for dialysis-related infections in Colorado occurs within outpatient dialysis centers only and excludes peritoneal and home dialysis. The outpatient facilities monitored may be dedicated, stand-alone facilities, hospital-based or affiliated units that primarily serve this patient population. The reporting of dialysis related infections began in March 2010, and currently there are 71 dialysis centers reporting to NHSN.

Dialysis centers in Colorado monitor patients for any of three specific events that must be reported: 1) an outpatient start of an intravenous antibiotic, 2) a positive blood culture, or 3) pus, redness or increased swelling at the vascular access site. This report depicts counts and rates for two types of dialysis related infections: access-related blood stream infections (ARB) and local access infections (LAI). An ARB, which poses more serious health implications and requires higher levels of care, is determined by the presence of a microorganism identified in a blood culture, and the source of infection is reported as the vascular access site. An LAI is defined as the presence of pus, redness or swelling of the vascular access site without the presence of an ARB. Although an LAI is not as severe as an ARB, antibiotics typically are given in either case.

Each table below lists the dialysis center's name, city, number of dialysis patients per month (patient months), numbers and rates of ARB and LAI, and comparisons to the national average (for ARB only). Currently, no national averages have been established for LAI. The infection rate used is the number of infections per 100 patient-months. The three categories that indicate how a Colorado dialysis center's infection rates compare to national infection rates are:

1. Statistically fewer infections than expected based on national infection rates (**better**);
2. Statistically similar infections as expected based on the national infection rates (**same)**; or
3. Statistically more infections than expected based on national infection rates (**worse**).

RESULTS

Tables 22 and 23 show the number and rates of ARB and LAI for each outpatient dialysis treatment center in Colorado. The reporting period is August 1, 2011 through July 31, 2014.

Seventy one dialysis treatment centers submitted dialysis infection data into NHSN this past year. Ten reported zero ARB infections, compared to six last year. Six centers had ARB rates worse than the national average, and one center had a better rate. The facility-specific LAI counts and rates presented in Table 22 below show six facilities with zero LAI; however, since no national rate for LAI has been established, comparisons are not yet available.

Ten centers reported zero ARB infections, compared to six last year. Six centers had ARB rates worse than the national average and one had a better rate.

In last year's report, Colorado dialysis ARB rates appeared better than national rates. After validation studies conducted in 2012 and 2014 identified unreported infections, Colorado dialysis facilities revised their data (see Appendix A). The new data show that aggregate Colorado dialysis ARB rates have been similar to national rates for the last two reporting years. While the statewide LAI rate is 1.3 per 100 patient months, national LAI rates are not yet available to provide comparisons.

TABLE 22: Number and Rates of Dialysis Access-Related Bloodstream Infections in Outpatient Dialysis Centers – Colorado, August 2011 – July 2014

Dialysis Access-Related Bloodstream infections: August 1, 2011 – July 31, 2014													
Dialysis Center and Region		August 2011- July 2012				August 2012-July 2013				August 2013- July 2014			
		No. of Patient Months	No. of Infections	Rate	National Comparison	No. of Patient Months	No. of Infections	Rate	National Comparison	No. of Patient Months	No. of Infections	Rate	National Comparison
AR Kidney Ctr of Arvada	Arvada	925	2	0.2	Same	1,072	3	0.3	Same	926	10	1.1	Same
AR Kidney Ctr of Bear Creek	Lakewood	241	2	0.8	Same	328	2	0.6	Same	302	1	0.3	Same
AR Kidney Ctr of Lafayette	Lafayette	546	2	0.4	Same	542	3	0.6	Same	456	1	0.2	Same
AR Kidney Ctr of Lakewood	Lakewood	785	3	0.4	Same	654	3	0.5	Same	756	2	0.3	Same
AR Kidney Ctr Longmont	Longmont	984	10	1	Same	922	7	0.8	Same	808	5	0.6	Same
AR Kidney Ctr Northridge	Westminster	Not yet operating				1	***	***	***	79	1	1.3	Same
AR Kidney Ctr Westminster	Westminster	1,359	5	0.4	Same	1,330	6	0.5	Same	1,147	3	0.3	Same
AR Kidney Ctr on Main	Longmont	124	0	0	Same	351	2	0.6	Same	303	0	0	Same
AR Parker Kidney Ctr	Douglas	Not yet operating				Not yet operating				101	0	0	Same
AR Thornton Kidney Ctr	Thornton	273	1	0.4	Same	449	2	0.4	Same	450	4	0.9	Same
Children's Hosptial Colorado	Aurora	131	10	7.6	Worse	183	2	1.1	Same	93	4	4.3	Same
Davita Alamosa	Alamosa	539	0	0	Same	543	4	0.7	Same	471	3	0.6	Same
Davita Arvada	Arvada	372	3	0.8	Same	421	2	0.5	Same	295	6	2	Worse
Davita Aurora	Aurora	1,450	20	1.4	Worse	1,468	22	1.5	Worse	1,212	12	1	Same
Davita Belcaro	Denver	695	7	1	Same	634	4	0.6	Same	489	7	1.4	Worse
Davita Black Canyon	Montrose	209	1	0.5	Same	257	1	0.4	Same	236	3	1.3	Same
Davita Boulder	Boulder	276	0	0	Same	282	0	0	Same	239	1	0.4	Same
Davita Brighton	Brighton	558	0	0	Same	512	5	1	Same	502	9	1.8	Worse
Davita Commerce City	Commerce City	627	2	0.3	Same	558	5	0.9	Same	372	5	1.3	Same
Davita Cortez	Cortez	801	1	0.1	Same	678	2	0.3	Same	562	2	0.4	Same
Davita Durango	Durango	342	1	0.3	Same	389	1	0.3	Same	315	4	1.3	Same
Davita East Aurora	Aurora	1,275	10	0.8	Same	1,129	6	0.5	Same	887	5	0.6	Same
Davita East Denver	Denver	836	2	0.2	Same	808	2	0.2	Same	668	6	0.9	Same
Davita Englewood	Englewood	583	6	1	Same	523	4	0.8	Same	460	2	0.4	Same
Davita Fountain	Fountain	408	0	0	Same	428	1	0.2	Same	327	0	0	Same
Davita Grand Junction	Grand Junction	775	2	0.3	Same	689	7	1	Same	630	2	0.3	Same
Davita Lakewood Crossing	Lakewood	1,200	11	0.9	Same	1,102	7	0.6	Same	859	10	1.2	Same
Davita Lakewood	Lakewood	1,048	7	0.7	Same	1,036	10	1	Same	824	12	1.5	Worse

Dialysis Access-Related Bloodstream infections: August 1, 2011 – July 31, 2014													
Dialysis Center and Region		August 2011- July 2012				August 2012-July 2013				August 2013- July 2014			
		No. of Patient Months	No. of Infections	Rate	National Comparison	No. of Patient Months	No. of Infections	Rate	National Comparison	No. of Patient Months	No. of Infections	Rate	National Comparison
Davita Littleton	**Littleton**	805	0	0	Better	768	3	0.4	Same	575	0	0	Same
Davita Lonetree-Skyridge	**Lone tree**	460	1	0.2	Same	343	0	0	Same	274	3	1.1	Same
Davita Longmont	**Longmont**	300	1	0.3	Same	256	3	1.2	Same	197	3	1.5	Same
Davita Loveland Central	**Larimer**	Not yet operating				60	3	5	Worse	138	8	5.8	Worse
Davita Lowry	**Lowry**	1,070	19	1.8	Worse	1,016	2	0.2	Same	845	3	0.4	Same
Davita Mesa County	**Grand Junction**	229	2	0.9	Same	327	2	0.6	Same	212	2	0.9	Same
Davita North Colorado Springs	**Colorado Springs**	134	1	0.7	Same	156	0	0	Same	185	1	0.5	Same
Davita North Metro	**Westminster**	387	2	0.5	Same	393	2	0.5	Same	418	5	1.2	Same
Davita Northeastern Co.	**Sterling**	369	2	0.5	Same	405	3	0.7	Same	318	5	1.6	Same
Davita Parker	**Parker**	339	1	0.3	Same	410	5	1.2	Same	357	4	1.1	Same
Davita Pikes Peak	**Colorado Springs**	1,042	3	0.3	Same	984	12	1.2	Same	807	5	0.6	Same
Davita Printers Place	**Colorado Springs**	182	0	0	Same	192	1	0.5	Same	171	3	1.8	Same
Davita Red Hawk	**Castle Rock**	13	***	***	***	85	1	1.2	Same	73	0	0	Same
Davita Sable Dialysis	**Aurora**	Not yet operating				529	9	1.7	Worse	704	6	0.9	Same
Davita South Denver	**Denver**	723	3	0.4	Same	608	3	0.5	Same	429	6	1.4	Same
Davita Southwest Denver	**Denver**	123	1	0.8	Same	291	1	0.3	Same	302	2	0.7	Same
Davita Thornton	**Thornton**	978	6	0.6	Same	827	6	0.7	Same	719	9	1.3	Worse
Davita West Lakewood	**Jefferson**	Not yet operating				Not yet operating				51	1	2	Same
Davita Westminster	**Westminster**	675	1	0.1	Same	505	1	0.2	Same	363	3	0.8	Same
Denver Women's Correctional Facility	**Denver**	287	0	0	Same	269	0	0	Same	241	0	0	Same
Dialysis Clinic Inc- Grand Junction	**Grand Junction**	182	0	0	Same	269	0	0	Same	268	0	0	Same
Dialysis Clinic Inc. Montrose	**Montrose**	376	1	0.3	Same	411	2	0.5	Same	348	1	0.3	Same
FMC Pueblo South	**Pueblo**	959	9	0.9	Same	1,010	15	1.5	Same	876	5	0.6	Same
FMC Pueblo West	**Pueblo**	286	0	0	Same	273	1	0.4	Same	246	0	0	Same
FMC Stapleton	**Denver**	520	2	0.4	Same	521	4	0.8	Same	456	7	1.5	Same
FMC Canon City	**Canon City**	413	6	1.5	Same	430	3	0.7	Same	370	1	0.3	Same
FMC Denver Central	**Denver**	1,247	11	0.9	Same	1,137	8	0.7	Same	777	2	0.3	Same
FMC East Denver	**Aurora**	1,256	2	0.2	Better	1,208	5	0.4	Same	1,059	15	1.4	Same
FMC Fort Collins	**Fort Collins**	984	0	0	Better	880	6	0.7	Same	640	5	0.8	Same
FMC Greeley	**Greeley**	1,367	0	0	Better	1,408	2	0.1	Better	1,188	2	0.2	Better

Dialysis Access-Related Bloodstream infections: August 1, 2011 – July 31, 2014													
Dialysis Center and Region		August 2011- July 2012				August 2012-July 2013				August 2013- July 2014			
		No. of Patient Months	No. of Infections	Rate	National Comparison	No. of Patient Months	No. of Infections	Rate	National Comparison	No. of Patient Months	No. of Infections	Rate	National Comparison
FMC La Junta	**La Junta**	433	2	0.5	Better	456	3	0.7	Better	347	0	0	Same
FMC Lamar	**Lamar**	266	4	1.5	Same	289	1	0.3	Same	238	1	0.4	Same
FMC Pueblo	**Pueblo**	716	0	0	Better	708	3	0.4	Same	586	5	0.9	Same
FMC Rocky Mountain	**Denver**	1,068	12	1.1	Same	984	7	0.7	Same	738	4	0.5	Same
FMC South Denver	**Denver**	Not yet operating				Not yet operating				4	***	***	***
FMC Walsenburg	**Walsenburg**	144	2	1.4	Same	179	3	1.7	Same	208	1	0.5	Same
FMC West Hampden	**Englewood**	Not yet operating				40	***	***	***	38	***	***	***
Liberty Castle Rock	**Castle Rock**	130	0	0	Same	133	1	0.8	Same	102	0	0	Same
Liberty Colorado Springs Central	**Colorado Springs**	1,174	4	0.3	Better	1,078	7	0.6	Same	952	8	0.8	Same
Liberty Colorado Springs North	**Colorado Springs**	455	0	0	Better	461	2	0.4	Same	416	1	0.2	Same
Liberty Colorado Springs South	**Colorado Springs**	595	3	0.5	Same	686	1	0.1	Same	668	12	1.8	Same
Liberty Pueblo	**Pueblo**	530	3	0.6	Same	495	2	0.4	Same	408	2	0.5	Same
Loveland Dialysis	**Colorado Springs**	692	6	0.9	Same	644	5	0.8	Same	492	6	1.2	Same
Reliant Renal Care - Colorado Springs	**Colorado Springs**	167	1	0.6	Same	34	***	***	***	Closed			
Reliant Renal Care - Trinidad	**Trinidad**	141	0	0	Same	52	0	0	Same	Closed			
UC Hospital Chronic Dialysis Unit	**Denver**	384	4	1	Same	236	2	0.8	Same	Closed			

Note: AR=American Renal, FMC=Fresenius Medical Care. Facility dialysis-related infection rates are per 100 patient months.
Data are limited to the following access types: fistula, graft, tunneled central line, and non-tunneled central line.
National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2006.
See "Dialysis Surveillance Report: National Healthcare Safety Network (NHSN) - Data Summary for 2006", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention
*** Indicates value not shown due to suppression of infections data.
Infection data for dialysis centers with fewer than 50 patients in a twelve-month period are suppressed to protect confidential health information. These dialysis centers have met the reporting requirements.
Source: National Healthcare Safety Network (NHSN) Database.

TABLE 23: Number and Rates of Dialysis Local Access Infections in Outpatient Dialysis Centers - Colorado, August 2011 – July 2014

Dialysis-Related Infections: Local Access Infections: August 1, 2011 – July 31, 2014										
Dialysis Center and City		August 2011- July 2012			August 2012-July 2013			August 2013- July 2014		
		No. of Patient Months	No. of Infections	Rate	No. of Patient Months	No. of Infections	Rate	No. of Patient Months	No. of Infections	Rate
AR Kidney Center of Arvada	Arvada	925	22	2.4	1,072	21	2	926	21	2.3
AR Kidney Center of Bear Creek	Lakewood	241	9	3.7	328	12	3.7	302	7	2.3
AR Kidney Center of Lafayette	Lafayette	546	0	0	542	1	0.2	456	0	0
AR Kidney Center of Lakewood	Lakewood	785	12	1.5	654	10	1.5	756	24	3.2
AR Kidney Center of Longmont	Longmont	984	10	1	922	4	0.4	808	4	0.5
AR Kidney Center of Northridge	Westminster	Not yet operating			1	***	***	79	1	1.3
AR Kidney Center of Westminster	Westminster	1,359	18	1.3	1,330	16	1.2	1,147	23	2
AR Kidney Center on Main	Longmont	124	2	1.6	351	8	2.3	303	6	2
AR Parker Kidney Center	Douglas	Not yet operating			Not yet operating			101	2	2
AR Thornton Kidney Center	Thornton	273	3	1.1	449	5	1.1	450	11	2.4
Children's Hospital Colorado	Aurora	131	1	0.8	183	0	0	93	2	2.2
Davita Alamosa	Alamosa	539	2	0.4	543	11	2	471	6	1.3
Davita Arvada	Arvada	372	1	0.3	421	11	2.6	295	6	2
Davita Aurora	Aurora	1,450	6	0.4	1,468	16	1.1	1,212	12	1
Davita Belcaro	Denver	695	6	0.9	634	13	2.1	489	1	0.2
Davita Black Canyon	Montrose	209	1	0.5	257	9	3.5	236	3	1.3
Davita Boulder	Boulder	276	1	0.4	282	6	2.1	239	5	2.1
Davita Brighton	Brighton	558	0	0	512	10	2	502	12	2.4
Davita Commerce City	Commerce City	627	5	0.8	558	7	1.3	372	4	1.1
Davita Cortez	Cortez	801	3	0.4	678	6	0.9	562	9	1.6
Davita Durango	Durango	342	7	2	389	14	3.6	315	6	1.9
Davita East Aurora	Aurora	1,275	14	1.1	1,129	13	1.2	887	12	1.4
Davita East Denver	Denver	836	7	0.8	808	31	3.8	668	23	3.4
Davita Englewood	Englewood	583	0	0	523	12	2.3	460	3	0.7
Davita Fountain	Fountain	408	3	0.7	428	4	0.9	327	1	0.3
Davita Grand Junction	Grand Junction	775	14	1.8	689	17	2.5	630	10	1.6
Davita Lakewood Crossing	Lakewood	1,200	10	0.8	1,102	22	2	859	13	1.5

Dialysis-Related Infections: Local Access Infections: August 1, 2011 – July 31, 2014										
Dialysis Center and City		August 2011- July 2012			August 2012-July 2013			August 2013- July 2014		
		No. of Patient Months	No. of Infections	Rate	No. of Patient Months	No. of Infections	Rate	No. of Patient Months	No. of Infections	Rate
Davita Lakewood	**Lakewood**	1,048	4	0.4	1,036	32	3.1	824	18	2.2
Davita Littleton	**Littleton**	805	1	0.1	768	10	1.3	575	4	0.7
Davita Lonetree-Skyridge	**Lone tree**	460	2	0.4	343	2	0.6	274	5	1.8
Davita Longmont	**Longmont**	300	7	2.3	256	5	2	197	4	2
Davita Loveland Central	**Larimer**	Not yet operating			60	1	1.7	138	1	0.7
Davita Lowry Dialysis	**Lowry**	1,070	1	0.1	1,016	14	1.4	845	12	1.4
Davita Mesa County	**Grand Junction**	229	1	0.4	327	9	2.8	212	10	4.7
Davita North Colorado Springs	**Colorado Springs**	134	2	1.5	156	1	0.6	185	1	0.5
Davita North Metro Dialysis Center	**Westminster**	387	4	1	393	7	1.8	418	13	3.1
Davita Northeastern Co. Dialysis	**Sterling**	369	0	0	405	7	1.7	318	2	0.6
Davita Parker Dialysis Center	**Parker**	339	0	0	410	14	3.4	357	11	3.1
Davita Pikes Peak	**Colorado Springs**	1,042	5	0.5	984	9	0.9	807	7	0.9
Davita Printers Place	**Colorado Springs**	182	0	0	192	2	1	171	0	0
Davita Red Hawk	**Castle Rock**	13	***	***	85	3	3.5	73	1	1.4
Davita Sable Dialysis	**Aurora**	Not yet operating			529	11	2.1	704	18	2.6
Davita South Denver	**Denver**	723	4	0.6	608	12	2	429	9	2.1
Davita Southwest Denver	**Denver**	123	2	1.6	291	6	2.1	302	7	2.3
Davita Thornton	**Thornton**	978	2	0.2	827	11	1.3	719	9	1.3
Davita West Lakewood	**Jefferson**	Not yet operating			Not yet operating			51	0	0
Davita Westminster	**Westminster**	675	2	0.3	505	12	2.4	363	3	0.8
Denver Women's Correctional Facility	**Denver**	287	0	0	269	0	0	241	0	0
Dialysis Clinic Inc. Grand Junction	**Grand Junction**	182	2	1.1	269	1	0.4	268	2	0.7
Dialysis Clinic Inc. Montrose	**Montrose**	376	1	0.3	411	7	1.7	348	6	1.7
FMC Pueblo South	**Pueblo**	959	15	1.6	1,010	4	0.4	876	5	0.6
FMC Pueblo West Dialysis	**Pueblo**	286	1	0.3	273	2	0.7	246	0	0

Dialysis-Related Infections: Local Access Infections: August 1, 2011 – July 31, 2014										
Dialysis Center and City		August 2011- July 2012			August 2012-July 2013			August 2013- July 2014		
		No. of Patient Months	No. of Infections	Rate	No. of Patient Months	No. of Infections	Rate	No. of Patient Months	No. of Infections	Rate
FMC Stapleton Dialysis	**Denver**	520	3	0.6	521	4	0.8	456	1	0.2
FMC Canon City	**Canon City**	413	2	0.5	430	1	0.2	370	1	0.3
FMC Denver Central Dialysis	**Denver**	1,247	32	2.6	1,137	14	1.2	777	9	1.2
FMC East Denver	**Aurora**	1,256	16	1.3	1,208	7	0.6	1,059	11	1
FMC Fort Collins	**Fort Collins**	984	19	1.9	880	15	1.7	640	7	1.1
FMC Greeley	**Greeley**	1,367	6	0.4	1,408	11	0.8	1,188	1	0.1
FMC La Junta	**La Junta**	433	2	0.5	456	2	0.4	347	0	0
FMC Lamar	**Lamar**	266	3	1.1	289	0	0	238	1	0.4
FMC Pueblo	**Pueblo**	716	6	0.8	708	10	1.4	586	2	0.3
FMC Rocky Mountain	**Denver**	1,068	25	2.3	984	9	0.9	738	6	0.8
FMC South Denver	**Denver**	Not yet operating			Not yet operating			4	***	***
FMC Walsenburg	**Walsenburg**	144	1	0.7	179	1	0.6	208	4	1.9
FMC West Hampden	**Englewood**	Not yet operating			40	***	***	38	***	***
Liberty Castle Rock	**Castle Rock**	130	1	0.8	133	3	2.3	102	0	0
Liberty Colorado Springs Central	**Colorado Springs**	1,174	5	0.4	1,078	14	1.3	952	16	1.7
Liberty Colorado Springs North	**Colorado Springs**	455	1	0.2	461	0	0	416	0	0
Liberty Colorado Springs South	**Colorado Springs**	595	0	0	686	0	0	668	5	0.7
Liberty Pueblo	**Pueblo**	530	4	0.8	495	4	0.8	408	3	0.7
Loveland	**Colorado Springs**	692	16	2.3	644	7	1.1	492	1	0.2
Reliant Renal Care - Colorado Springs	**Colorado Springs**	167	5	3	34	***	***	Closed		
Reliant Renal Care - Trinidad	**Trinidad**	141	0	0	52	1	1.9	Closed		
UC Hospital Chronic Dialysis Unit	**Denver**	384	1	0.3	236	1	0.4	Closed		

Note: AR=American Renal, FMC=Fresenius Medical Care. Facility dialysis-related infection rates are per 100 patient months.
Data are limited to the following access types: fistula, graft, tunneled central line, and non-tunneled central line.
*** Indicates value not shown due to suppression of infections data.
Infection data for dialysis centers with fewer than 50 patients in a twelve-month period are suppressed to protect confidential health information. These dialysis centers have met the reporting requirements.
Source: National Healthcare Safety Network (NHSN) Database.

CLOSTRIDIUM DIFFICILE INFECTION

Clostridium difficile infections (CDI) are a growing problem in health care. *C. difficile* is a spore forming bacteria that can cause symptoms ranging from bloating, diarrhea, fever, and abdominal pain to life-threatening colon inflammation, sepsis and even death. Between 2000 to 2009, the discharge diagnosis of CDI in hospitalized patients increased from approximately 139,000 to 336,000[14] , and is estimated to cause 14,000 deaths per year[15]. Risk factors for CDI include antibiotic administration, increasing age, duration of hospital stay, and severity of underlying diseases[16]. CDI also may be acquired outside of hospitals in the community, and exposures to other types of health care are also a risk factor. Although 94% of CDI are related to health care exposures, 75% of health-care associated CDI have their onset outside of hospitals[17].

Based on the high incidence and potential severity of CDI, Colorado's HAI Advisory Committee decided to add CDI to state reporting requirements for acute care hospitals. CDI data became available January 1, 2013, and therefore last year's data is only a partial year (January 1, 2013 through July 31, 2013). Hospital reported CDI data are classified as hospital-onset (HO), community-onset (CO), and community-onset health care facility associated (CO-HCFA). HO cases are laboratory positive specimens collected >3 days after admission to the facility (i.e., on or after day 4). CO include laboratory identified specimens collected in an outpatient location or an inpatient location ≤3 days after admission to the facility (i.e., days 1, 2, or 3 of admission). CO-HCFA cases include specimens collected from patients discharged from the facility ≤4 weeks prior to current date of stool specimen collection. Data from outpatient locations (e.g., outpatient encounters) are not included in this definition. Only laboratory-identified hospital-onset cases are presented in this report.

Of 53 hospitals reporting CDI this year, 7 reported zero hospital-onset infections. This year, 9 hospitals were worse than the national rate and 6 were better.

RESULTS

Table 24 presents laboratory identified hospital onset *C. difficile* cases reported by acute care hospitals from January 2013 through July 2014.

Fifty three hospitals submitted CDI data into NHSN this past year. Seven reported zero CDI. Nine hospitals had CDI rates worse than the national average and six had better rates.

Table 24: Number of *Clostridium difficile* Infections and Standardized Infection Ratios in Hospitals – Colorado, January 2013-July 2014

***Clostridium difficile* Infections in Hospitals (facility wide): January 1, 2013 – July 31, 2014**									
Health Facility and City		**January- July 2013**				**August 2013- July 2014**			
		No. of Patient Days	**No. of Infections**	**SIR**	**National Comparison**	**No. of Patient Days**	**No. of Infections**	**SIR**	**National Comparison**
Animas Surgical Hospital	**Durango**	679	0	0	Same	497	0	0	Same
Arkansas Valley Regional MC	**La Junta**	2,555	4	2.3	Same	3,816	0	0	Same
Boulder Community Hospital	**Boulder**	16,578	17	1.5	Same	28,197	18	1	Same
Boulder Community Hospital-Foothills	**Boulder**	3,926	8	3.3	Worse	6,602	4	1	Same
Castle Rock Adventist Hospital	**Castle Rock**	Not yet operating				7,232	2	0.4	Same
Centura Avista Adventist Hospital	**Louisville**	5,184	3	1	Same	10,704	4	0.6	Same
Centura Littleton Adventist Hospital	**Littleton**	21,665	12	1	Same	40,718	34	1.4	Same
Centura Penrose St Francis Health	**Colorado Springs**	29,658	16	0.9	Same	61,866	33	0.9	Same
Centura Porter Adventist Hospital	**Denver**	30,449	9	0.4	Better	51,440	24	0.7	Same
Centura St Anthony Central Hospital	**Denver**	34,003	31	2	Worse	61,048	40	1.1	Same
Centura St Anthony North Hospital	**Westminster**	13,561	19	1.9	Worse	23,492	17	1	Same
Centura St Francis MC	**Colorado Springs**	17,846	1	0.1	Better	31,303	11	0.7	Same
Centura St Mary Corwin MC	**Pueblo**	14,978	11	1.3	Same	25,750	5	0.4	Better
Centura St Thomas More Hospital	**Canon City**	3,503	2	1.2	Same	5,535	2	0.8	Same
Colorado Plains MC	**Fort Morgan**	4,100	4	1.6	Same	6,436	2	0.5	Same
Community Hospital	**Grand Junction**	3,023	2	1.1	Same	6,336	5	1.2	Same
Delta County Memorial Hospital	**Delta**	3,230	0	0	Same	3,504	1	0.5	Same
Denver Health MC	**Denver**	57,261	39	0.8	Same	98,350	70	0.8	Same
East Morgan County Hospital	**Brush**	1,248	0	0	Same	2,213	0	0	Same
Exempla Good Samaritan MC	**Lafayette**	28,721	16	1.2	Same	51,371	47	1.7	Worse
Exempla Lutheran MC	**Wheat Ridge**	45,599	41	1.6	Worse	65,362	35	0.9	Same
Exempla St Joseph Hospital	**Denver**	49,951	31	1	Same	76,381	61	1	Same
Kit Carson Memorial Hospital	**Burlington**	***	***	***	***	128	1	21	Same
Longmont United Hospital	**Longmont**	17,854	12	0.9	Same	28,667	16	0.8	Same
McKee Medical Center	**Loveland**	8,986	3	0.5	Same	14,328	5	0.5	Same
Medical Center of Aurora	**Aurora**	41,864	50	1.5	Worse	73,096	85	1.6	Worse

Clostridium difficile Infections in Hospitals (facility wide): January 1, 2013 – July 31, 2014									
Health Facility and City		**January- July 2013**				**August 2013- July 2014**			
		No. of Patient Days	**No. of Infections**	**SIR**	**National Comparison**	**No. of Patient Days**	**No. of Infections**	**SIR**	**National Comparison**
Medical Center of the Rockies	**Loveland**	22,805	26	1.5	Same	41,109	45	1.8	Worse
Memorial Hospital Central	**Colorado Springs**	40,349	7	0.3	Better	59,427	18	0.5	Better
Memorial Hospital North	**Colorado Springs**	6,277	2	0.7	Same	13,938	1	0.1	Better
Mercy Regional MC	**Durango**	7,853	5	1.3	Same	11,709	15	2.6	Worse
Montrose Memorial Hospital	**Montrose**	3,537	0	0	Same	8,672	4	0.8	Same
North Colorado MC	**Greeley**	32,267	16	0.7	Same	52,850	26	0.7	Better
North Suburban MC	**Thornton**	15,139	14	1.3	Same	24,481	17	1	Same
OrthoColorado Hospital at St. Anthony	**Lakewood**	2,710	0	0	Same	4,293	0	0	Same
Pagosa Springs MC	**Pagosa Springs**	Not yet operating				636	0	0	Same
Parker Adventist Hospital	**Parker**	12,868	12	2	Worse	24,407	14	1	Same
Parkview MC	**Pueblo**	44,994	26	0.6	Better	83,433	38	0.5	Better
Pikes Peak Regional Hospital	**Woodland Park**	1,299	1	1.5	Same	2,063	0	0	Same
Platte Valley MC	**Brighton**	5,474	3	1.1	Same	9,464	2	0.4	Same
Poudre Valley Hospital	**Ft Collins**	23,635	43	2.4	Worse	39,518	35	1.5	Worse
Presbyterian St Lukes MC	**Denver**	33,414	40	1.4	Same	54,745	56	1.6	Worse
Rose Medical Center	**Denver**	27,264	21	0.8	Same	39,499	24	0.8	Same
San Luis Valley Regional MC	**Alamosa**	2,623	0	0	Same	5,410	4	1.4	Same
Sky Ridge MC	**Lone Tree**	26,794	20	1	Same	44,209	45	1.4	Worse
Southwest Memorial Hospital	**Cortez**	2,172	1	0.7	Same	3,665	0	0	Same
St Anthony Summit MC	**Frisco**	1,610	0	0	Same	2,329	1	0.8	Same
St Marys Hospital	**Grand Junction**	31,836	16	0.6	Same	56,822	28	0.6	Better
Sterling Regional MC	**Sterling**	2,557	1	0.7	Same	3,778	1	0.3	Same
Swedish Medical Center	**Englewood**	53,003	74	1.7	Worse	91,285	108	1.7	Worse
University of Colorado Hospital	**Aurora**	73,538	89	1.3	Worse	142,031	164	1.4	Worse
Vail Valley MC	**Vail**	3,635	1	0.4	Same	5,610	2	0.5	Same
Valley View Hospital	**Glenwood Springs**	5,978	2	0.5	Same	10,103	4	0.6	Same
Yampa Valley MC	**Steamboat Springs**	2,503	1	0.7	Same	5,481	1	0.4	Same

Note: SIR=standardized infection ratio, the ratio of observed to expected infection adjusted for facility risk factors. National comparisons are based on the indirect adjustment of modeled risk factors applied to total patient days. See "Risk Adjustment for Healthcare Facility-Onset *C. difficile* and MRSA Bacteremia Laboratory-identified Event Reporting in NHSN" (CDC).
*** Indicates value not shown due to suppression of infections data, or no National or historical rate, or an expected count of zero, to which to compare facility rate.
Source: National Healthcare Safety Network (NHSN) Database.

CONCLUSIONS

Colorado mandated reporting of HAI in 2006. To date, eight annual reports have been submitted to the legislature and public demonstrating a commitment by the Colorado Department of Public Health and Environment and infection prevention professionals to track, monitor and report HAI data. Constant attention is needed to ensure patient safety in all types of health care facilities. Any success in reducing these serious infections will require continued effort from multiple stakeholders including patients and their families, care providers, administrators and state health departments.

Key findings described in this report include the following:

- Of reportable surgeries in Colorado, the three most common surgeries performed between August 1, 2013 and July 31, 2014 were knee replacements (n=14,567 in hospitals and 635 in ambulatory surgery centers), breast procedures (n=9,899 in hospitals and 5,476 in ambulatory surgery centers) and hip replacements (n=9,740 and 278 in ambulatory surgery centers).
- Most Colorado health facilities had HAI rates similar to national rates for most reportable HAI.
- Statewide aggregate SSI rates for coronary artery bypass surgeries were better than national rates this year.
- Statewide aggregate SSI rates for colon surgeries, abdominal hysterectomies, and hip and knee replacement surgeries performed in hospitals have been better than national rates for the last three years.
- Statewide aggregate SSI rates for hernia repairs performed in ambulatory surgery centers have been better than national rates for the last three years.
- Statewide aggregate rates for breast surgeries performed in hospitals have been worse than national rates for the last three years.
- Ambulatory surgery centers traditionally report fewer infections than hospitals, which might be due in part to reduced opportunity to conduct post surgical follow-up with patients and surgeons.
- Statewide aggregate CLABSI rates in long-term acute care hospitals were better than the national average. CLABSI rates for adult critical care units, neonatal critical care units, and rehabilitation hospitals remained steady and the same as national rates.
- Statewide, Colorado's aggregate dialysis access related bloodstream infection rates have been the same as national rates in the last two reporting years.
- Statewide aggregate rates for CDI were similar to national rates in the last reporting year.

While this report only includes information on a subset of HAIs, the information provided can be used as an important indicator of health care quality and infection prevention efforts in Colorado facilities. Beyond the number and rate of HAI for each facility, consumers can see the volume of procedures performed at each facility, which can be an indicator of experience and practice.

Users of this report should note that the data presented are self-reported by each facility and that data validation studies only have been completed thus far for selected CLABSI, SSI and dialysis-related infections (see Appendix A). It is recommended that conclusions regarding health care quality be made in conjunction with other quality indicators and that consumers consult with doctors, health care

facilities, health insurance carriers, health care websites from reputable sources (e.g., Hospital Compare, Colorado Hospital Report Card, or Leap Frog), and their families and friends before deciding where to receive care.

The department will continue its work to reduce HAI in Colorado through various activities, including the tracking and publishing of HAI data, completion of HAI data validation studies, implementation of HAI prevention collaboratives, maintenance of communication vehicles for HAI related information and collaboration with internal and external partners committed to patient safety.

It is hoped that facilities will use the data in this report to target and improve infection prevention efforts and that consumers will use these data to make more informed health care decisions.

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APPENDICES

APPENDIX A: HAI DATA VALIDATION STUDIES AND PREVENTION PROJECTS

DATA VALIDATION STUDIES

As part of a comprehensive reform to address HAI, many states, including Colorado, have mandated reporting to create greater transparency between health care facilities and the public while supporting greater accountability. According to Lin[18], inter-facility comparisons of the data are only valid when the methods of surveillance are uniform and reliable across institutions. The Health Facility Infection Surveillance Unit has conducted several validation studies including follow-up validation studies to date summarized in table below. A validation study for colon procedures is currently underway.

Study description	Initial study Year	Follow-up study Year
CLABSI	2011	2014
Dialysis Events	2012	2014
Hip and Knee	2012	n/a
Hernia	2014	n/a

Central Line Associated Bloodstream Infection (CLABSI)

A CLABSI data validation study completed in May 2011 and published in the American Journal of Infection Control in 2013 found that 33 percent of cases identified by trained reviewers were not reported. A wide variation in surveillance practices and in the application of definitions and criteria was also noted. A follow-up validation completed in July 2014 found that only two percent of cases were not reported. This improvement was noted along with observed improvement in infection preventionist's knowledge of surveillance definitions and practices.

Hernia Surgery Infections

An SSI data validation study was completed in 2012. The objectives were to learn how facilities conduct post-discharge surveillance following surgery, assess the accuracy of data reported for risk adjustment, and assess accuracy in which facility staff applied NHSN definitions and criteria. Forty-one facilities were visited (31 hospitals and 10 ambulatory surgery centers) to perform chart reviews of hernia procedures and infections reported through NHSN from January through June 2010. Of 438 charts reviewed, two non-reported events were found and eight events were over-reported.

Hip and Knee validation

Twenty five facilities participated in this study, including 21 facilities that reported at least one SSI during the study period. For each facility, all reported SSI plus an additional ten randomly selected patient charts (without SSI) were reviewed. A questionnaire was administered to infection preventionists to assess the adequacy of NHSN recommended surveillance methods and definitions. An exit interview was completed at the end of each site visit providing another opportunity for on-site education and clarification. The audit found no over or under reported SSI and a solid level of understanding and application of NHSN surveillance methods and definitions by infection preventionists. However, several facilities showed errors in classifying SSI depth (superficial versus deep), which may have been based on incomplete information available in the medical records, and lack of time and resources for additional review or update of SSI once entered in NHSN.

Dialysis Infections

In 2012, a validation study to assess reporting accuracy of dialysis event data was conducted. Of 65 operating dialysis treatment centers in Colorado, 25 were visited to perform patient chart reviews to identify non- and over-reported events. Of 467 charts reviewed in 25 facilities, 29 percent of events were found to be unreported while 13 percent of reported events were over-reported.

In 2014, a follow-up validation study was conducted in 24 dialysis facilities. Of 377 charts reviewed, 23 percent of events were non-reported and 4 percent of events were over-reported. In summary, from 2012 to 2014, the number of non-reported and over-reported events declined, and appeared to be related to observed improvements in facility administrators' knowledge and application of surveillance methods and definitions.

PREVENTION COLLABORATIVES

Surgical Site Infections and *Clostridium difficile* Infections

During 2011-2012, the Colorado Department of Public Health and Environment partnered with the Colorado Hospital Association (CHA) and Denver Health Medical Center to implement two HAI prevention collaboratives for surgical site infections (SSI) and *Clostridium difficile* infection (CDI). Seventeen and 16 facilities, respectively, participated in the SSI and CDI collaboratives. Participants piloted and implemented new HAI prevention strategies, engaged additional hospital staff (i.e., physicians, environmental services) and shared data—all in the effort to achieve the following HAI reduction goals:

- ≥ 15 percent reduction in the SSI rate from baseline
- ≥ 15 percent reduction in CDI rates from baseline
- ≥ 90-95 percent adherence rates to process measures (dependent upon metric)

The following targets were achieved:

- Most hospitals maintained at least 90 percent adherence to CDI process measures
- CDI Hospital Onset (HO) rates declined by 14 percent,
- Community Onset-Hospital Associated (CO-HA) CDI rates declined by 24 percent
- Combined HO/CO-HA CDI rates reduced by 17 percent
- Most facilities remained at 95 percent adherence to SSI process measures
- Some facilities for certain surgeries reduced their SIR from 2009 to 2011 by ≥ 10 percent
- Most facilities showed a decline in SSI of at least 15 percent in 2011

Dialysis Infections

In 2012-2013, the Colorado Department of Public Health and Environment partnered with the Intermountain End Stage Renal Disease Network to implement a Dialysis Infection Prevention Collaborative. Representatives from 30 outpatient dialysis treatment centers (DTC) across Colorado implemented interventions to improve hand hygiene (HH), conducted observations of HH practices, submitted results of HH audits and continued to submit dialysis event data into NHSN. Results showed declines in access-related bloodstream infections for both collaborative and non-collaborative facilities, and a decline in local access infections for collaborative facilities only.

Dialysis Patient Education

In 2013-2014, the department received federal funding to implement a Dialysis Patient Education Collaborative that developed a standardized curriculum of education that includes key steps in infection prevention, vascular access and general patient care. The education is intended to engage patients in their own care by teaching observation and communication methods that empower them to observe staff technique, ask questions and provide feedback.

SPECIAL PROJECTS

Hand Hygiene Partnership

According to the Centers for Disease Control and Prevention (CDC), hand hygiene is the most important measure to prevent the transmission of harmful germs. Studies show that health care workers follow hand hygiene guidelines only about 40 percent of the time[19].

The Colorado Department of Public Health and Environment partnered with Telligen (formerly, Colorado Foundation for Medical Care) and the Colorado Hospital Association to develop and distribute a new hand hygiene improvement toolkit for providers in a variety of health care settings including nursing homes, hospitals, ambulatory surgery centers, home health, physician offices and clinics[20-22].

Emerging Infections Program (EIP)

Colorado is one of 10 states that is part of the Centers for Disease Control and Prevention Emerging Infections Program (EIP). The 10-state network comprises a catchment area of approximately 44 million people, and is roughly representative of the U.S. population on the basis of demographic characteristics such as age, gender, race, and urban residence, as well as health indicators such as population density and percent at or below the poverty level. The EIP network is a national resource for surveillance, prevention, and control of emerging infectious diseases. EIP activities go beyond routine functions of health departments by:

- Addressing the most important issues in infectious diseases and selecting projects that the EIP network is particularly suited to investigate
- Maintaining sufficient flexibility for emergency response and addressing new problems as they arise
- Developing and evaluating public health interventions and ultimately transferring what is learned to public health agencies
- Incorporating training as a key function of EIP activities
- Giving high priority to projects that lead directly to the prevention of disease

Colorado EIP HAI projects include a survey to identify the prevalence of HAIs, population-based active surveillance of pathogens of interest including *Clostridium difficile* (Denver metropolitan area), carbapenem-resistant *Enterobacteriaceae* (statewide) and *Acinetobacter* (Denver metropolitan area), and other HAI projects.

APPENDIX B: STANDARDIZED INFECTION RATIO OVERVIEW

The Standardized Infection Ratio (SIR) is a risk adjusted summary measure used for central line associated bloodstream infection (CLABSI) data, umbilical catheter associated infection (UCABI – Neonatal Critical Care Units only), Surgical Site Infection (SSI) data and dialysis-related infection (DRI) data. The SIR describes a facility's performance, taking into account individual facility's patient population risk. The SIR is the number of infections reported by the facility divided by the expected number of infections. The expected number of infections is determined by historical data collected by the NHSN as well as an individual facility's patient population. See example calculations below.

CLABSI in adult critical care units and long-term acute care hospitals
CLABSI in neonatal critical care units
SSI in hospitals and ambulatory surgery centers (hernia procedures only)
SSI in ambulatory surgery centers (hip and knee replacement procedures)
DRI in dialysis centers

Interpretation of the SIR is done by comparing a facility's value to 1 (observed and expected number of SSI are the same). In other words, the number of infections is what was expected based on the national average. If the SIR value is greater than 1.0, there are more infections than expected, and if the SIR value is less than 1, there are fewer infections than expected.

The statistical significance of the difference between the observed and expected SSI based on the national average is tested using a Poisson test. A p-value is computed from the test and helps to determine if the difference in the HAI rate is due to chance alone. If the p-value is greater than or equal to 0.05, then there is no significant difference (**SAME**) between the facility's HAI count and the expected count based on the national rate.

If the p-value is less than 0.05, then the difference is statistically significant, and the value of the SIR determines whether the facility is better than or worse than the national average. If the SIR is greater than 1, then the facility has significantly more CLABSI than were expected based on the national average (**WORSE**). The converse also applies where if the SIR is less than 1, the hospital has significantly fewer CLABSI than were expected (**BETTER**).

APPENDIX C: GLOSSARY OF TERMS AND ABBREVIATIONS

Access-related Bloodstream Infection (ARB): The presence of bacteria in the blood verified by culture with the source identified as the vascular access site or is unknown.

Ambulatory Surgery Center (ASC): A facility which operates exclusively for the purpose of providing surgical services to patients not requiring hospitalization.

Bloodstream Infection (BSI): An infection of the blood.

Central Line (CL): A flexible tube (intravascular catheter) that terminates at or close to the heart or in one of the great vessels.

Central Line-Associated Bloodstream Infection (CLABSI): A primary bloodstream infection (BSI) in a patient that had a central line within the 48-hour period before the development of the BSI.

Central Line-Associated Bloodstream Infection (CLABSI) Rate: The total number of central line-associated bloodstream infections divided by the number of central line days multiplied by 1,000.

Central Line Days (Device Days): A daily count of patients with a central line in place is performed at the same time each day.

Coronary Artery Bypass Graft Surgery (CBGB): A surgical treatment for heart disease in which a vein or artery from another part of the body is used to create an alternate path for blood to flow to the heart bypassing a blocked artery.

Critical Care Unit (CCU): A nursing care area that provides intensive observation, diagnosis, and therapeutic procedures for adults and/or children who are critically ill.

Dialysis Event (DE): An event for a dialysis patient involving any one of three possible scenarios: 1) hospitalization; 2) intravenous (IV) antimicrobial start; or 3) a positive blood culture. Dialysis event reporting involves *outpatient* facilities only.

Fascia: A thin layer of connective tissue covering, supporting, or connecting the muscles or inner organs of the body.

Great Vessel: Based on NHSN criteria for reporting central line BSI, the following are considered great vessels: aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, common femoral veins, and in neonates, the umbilical artery and vein.

Health Facility Acquired Infection or Health Care-Associated Infection (HAI): An infection of a patient that occurs in a health care setting which was not present or incubating at the time of admission and is not related to a previous admission.

Hip Replacement Surgery: An elective procedure for people with severe hip damage or pain related to chronic osteoarthritis, rheumatoid arthritis or other degenerative processes involving the hip joint.

Implant: A nonhuman-derived object, material, or tissue that is permanently placed in a patient during an operation. Examples include: heart valves, metal rods, mesh, wires, screws, cements, hip replacements and other devices.

Infection: An invasion of the body tissues by an infectious agent.

Infection Preventionist (IP): A health professional that has special training in infection prevention and monitoring.

Inpatient: A patient whose date of admission to a health care facility and the date of discharge are different calendar days.

IV Antimicrobial Start: The first dose of a medication given intravenously to kill microscopic infectious organisms such as bacteria and viruses in the body.

Knee Replacement Surgery (arthroplasty): An elective procedure for people with severe knee damage and pain related to osteoarthritis, rheumatoid arthritis, and traumatic arthritis.

Local Access Infection (LAI): Pus, redness, or swelling of the vascular access site without the presence of access-associated bacteremia, patient hospitalization, or initiation of an IV antimicrobial agent.

Location of Attribution: The inpatient location where the patient was assigned on the date of the bloodstream infection (BSI) event, which is further defined as the date when the first clinical evidence appeared or the date the specimen used to meet the BSI criteria was collected, whichever came first.

Long-Term Acute Care Hospital (LTAC): A specialty care hospital that cares for patients with serious medical conditions that require intense, special treatment for long periods of time (an average length of stay is 25 days).

Metric: A measurement for calculating health outcomes. There are both process metrics that measure adherence to standard health care quality processes, and outcome metrics that measure the number of patients affected by specific medical treatments.

National Health Care Safety Network (NHSN): NHSN is a secure, internet-based surveillance (monitoring and reporting) system managed by the Centers for Disease Control and Prevention (CDC) Division of Health care Quality Promotion

NHSN Operative Procedure: A procedure that meets the following criteria: 1) performed on a patient who is a NHSN inpatient or outpatient; 2) takes place during an operation; and 3) included in the NHSN operative procedure categories.

Neonate: An infant less than or up to 30 days of age.

Neonatal Critical Care Unit (NCCU): Patient care area providing care to most critically ill infants.

Outpatient: Patient whose date of admission to the facility and date of discharge are the same day.

Patient Days: The total number of inpatients for a particular unit determined at the same time each day for every day of the month recorded as a total sum for the month.

Permanent Central Line: A catheter that is tunneled under the skin on the chest wall and includes certain dialysis catheters (e.g., Hickman, Groshong, and Broviac) and implantable venous access ports (e.g., Port-a-Cath). Some dialysis patients may still have a port used for dialysis; however, most dialysis patients do not use this type of access due to the increased risk of infection. Ports are frequently used for administration of chemotherapeutic agents.

Population: The total number of inhabitants of a geographic area or the total number of persons in a particular group (e.g., the number of persons engaged in a certain occupation).

Prevalence: The number or proportion of cases, events or attributes among a given population.

Rate: An expression of the relative frequency with which an event occurs among a defined population and specific time period calculated as the number of new cases or deaths during a specified period divided by either person-time or the average (mid-interval) population.

Risk: The probability that an adverse event will occur (e.g., that a person will be affected by, or die from, an illness, injury, or other health condition within a specified time or age span).

Risk Adjustment: Accounts for differences in patient populations, enabling comparisons between hospitals.

Risk-Adjusted Rate: For surgical site infections, the risk-adjusted rate is based on a comparison of the actual (observed) rate and the expected rate if nationwide the patients had the same distribution of risk factors as the hospital. For CLABSI, the adjusted rate is a comparison of the actual rate and the expected rate based on national rates for each ICU or within birth weight categories for neonates.

Risk Factor: An aspect of personal behavior or lifestyle, an environmental exposure, or a hereditary characteristic that is associated with an increase in the occurrence of a particular disease, injury, or other health condition.

Standardized Infection Ratio (SIR): A risk adjusted summary measure that accounts for the type of procedure and risk category. The SIR provides an overall score for a procedure at each health facility based on the expected number of infections after adjusting for the risk category.

Surgical Site Infections (SSI): Infections that are directly related to an operative procedure. Some SSI are minor and only involve the skin or subcutaneous tissue. Other SSI may be deeper and more serious.

Surgical Site Infection Rate: Surgical site infection rates per 100 operative procedures are found by dividing the number of SSI by the total number of specific operative procedures within a given reporting period. The results are then multiplied by 100. These calculations are performed separately for each type of surgical procedure. They are listed by risk level.

Symptom: Any indication of disease noticed or felt by a patient.

Temporary Central Line: A central line that is not tunneled.

The Department: The Colorado Department of Public Health and Environment (CDPHE).

Trend: Movement or change in frequency over time, usually upwards or downwards**.**

Validation: A method of assessing the completeness and accuracy of reported HAI data.

Vascular Access Infection: An infection that is either a local access infection or access-related bloodstream infection.

Wound Class: An assessment of the likelihood and degree of contamination of a surgical wound at the time of the operation. Wounds are divided into four classes: clean, clean-contaminated, contaminated, and dirty.