State of Colorado
Status Report on the Health Facility Acquired Infections Disclosure Initiative

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Submitted to the Colorado General Assembly
By the Health Facilities and Emergency
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Environment

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of Public Health
and Environment

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Introduction

This report is being written to fulfill the initial reporting requirements set forth in Colorado Revised Statute title 25, article 3, part 6, the Hospital-Acquired Infections Disclosure Act. The Colorado General Assembly passed the Hospital-Acquired Infections Disclosure Act (House Bill 06-1045), in June 2006. The bill was sponsored by Representative Bob McClusky and Senator Maryanne Keller.

Note: This report uses the term "health facility-acquired infections" since the scope of the Colorado mandatory reporting law includes hospitals, hospital units, ambulatory surgery centers and dialysis treatment centers.

This bill requires hospitals, hospital units, ambulatory surgery centers and dialysis treatment centers to report health facility acquired infections data as a condition of their state licensure. The Colorado Department of Public Health and Environment (the department) is the lead state agency administering the initiative. The department is responsible for program implementation, oversight and reporting. The legislation requires the department's executive director to appoint an 11 member volunteer health facility acquired infections advisory committee to assist with these responsibilities.

The bill also requires that the department produce an annual report disclosing the results of the data submitted. This report serves as the second annual report, which is due to the Health and Human Services Committees of the House of Representatives and the Senate of the Colorado General Assembly by January 15, 2009.

This report describes:

- The disclosure initiative as described in the Act;
- The phased approach the department took in implementation;
- The initial reporting requirements and web-based reporting system;
- The limitations in appropriately implementing the initiative; and
- The data for Surgical Site Infections (SSIs), Adult Intensive Care Units (ICU) and Neonatal Intensive Care Units (NICU).

Not all health facilities targeted for reporting are doing so as:

1. The current reporting system only began accepting data from ambulatory surgery centers (ASCs) in October 2008.
2. The current reporting system only began accepting data from long term acute care centers (LTACs) in July 2008.
3. The initial clinical procedures selected for reporting did not include a dialysis treatment center measure.

Although there was no data available for the first annual report in January 2008, bulletins issued in July and October 2008 began to provide data on health facility acquired infections in Colorado. Reports released in 2009 and 2010 will begin to implement ASCs, LTACs and any

new hospitals' data to the reports as soon as a full year of data has been compiled. Dialysis treatment centers should begin reporting by the third quarter in 2009 and will be added to reports starting in 2010.

This report includes data from device-associated infections and procedure-associated infections. The device-associated infections are surgical site infections (SSIs); coronary artery bypass grafts with both chest and donor site incisions (CBGB), coronary artery bypass grafts with chest incision only (CBGC), hip prosthesis total and partial (HPRO) and knee prosthesis total and partial (KPRO). Herniorrhaphy (HER) will not be included on this report as data was not submitted until July 2008. In order to provide meaningful data on the infection rate of this procedure more time is needed to report but will be in the 2010 reports. Data from procedure-associated infections includes central line associated blood stream infections from all levels of adult and neonate locations. This includes adult medical/surgical critical care, medical cardiac critical care, surgical cardiothoracic critical care, medical critical care, and surgical critical care. For neonate central lines the report includes both level II/III and level III hospital care settings, but only reports on central lines, not umbilical catheters.

Health Facility Acquired Infections Disclosure Initiative

Health facility acquired infections are infections that occur during or after treatment for a separate medical condition in a health facility. The occurrence of health facility acquired infections is a growing concern among healthcare consumers, purchasers and workers. While the public is increasingly seeking information about health facility acquired infections, most hospitals and other healthcare facilities currently do not publicly report this data.

As consumer demand for public reporting of healthcare quality data continues to increase, policymakers across the nation have recognized this demand and the need for this information in consumer focused healthcare quality reports. This recognition has led 20 states to pass laws requiring mandatory public reporting of health facility acquired infections since 2004. Colorado's Hospital-Acquired Infections Disclosure Act (House Bill 06-1045) was approved in June 2006.

This law requires hospitals, hospital units, ambulatory surgery centers and dialysis treatment centers to report health facility acquired infections data as a condition of their state licensure. The law also calls for physicians to close the loop and ensure infections diagnosed during follow-up care visits are reported back to the facilities where the procedures were performed.

Many of these health facilities have collected and tracked health facility acquired infection data for decades, but this information was not released to the public. The intent of the law is to have all the targeted health facilities report infection data to one web-based system. The system will help to ensure facilities are using the same definitions and data constraints so that the information collected can be easily understood by the public and compared to national rates.

The Colorado Department of Public Health and Environment (the department) is the lead state agency administering the disclosure initiative. In accordance with the legislation, the department appointed an advisory committee to assist with initiative oversight, selecting the clinical procedures, assuring the quality and accuracy of the data, and developing and distributing the reports. The department is ultimately responsible for program implementation, oversight and reporting.

Implementing the Disclosure Initiative

Implementing the health facility acquired infections disclosure initiative is an in-depth process that has five main phases:

1. Appoint an advisory committee;
2. Select clinical metrics;
3. Provide technical assistance;
4. Evaluate the initiative; and
5. Report results.

Extensive work has gone into each phase of the implementation as described below.

Phase 1: Appoint an Advisory Committee

The legislation requires the executive director of the department to appoint an 11 member health facility acquired infections advisory committee. The Colorado Health Facility Acquired Infection Advisory Committee make-up is detailed in the appendices, Appendix A.

Many of the initiative elements had to be decided on through the committee. The legislation mandated that the committee assist the department with initiative oversight, selecting clinical procedures, assuring quality and accuracy of the data and developing and distributing the reports. The selected committee members were notified in March 2007. The committee first met on April 23, 2007. The legislation requires the committee to meet at least four times per year; however, the members have opted for monthly meetings in 2007, 2008 and 2009.

The committee has provided the department invaluable expertise. The caliber of members that sit on the advisory committee will continue to play a pivotal role in future metric selection and reporting activities.

Phase 2: Select Clinical Metrics

Phase two of the mandatory health facility acquired infection reporting initiative was to select the metrics health facilities would report. The department and the advisory committee were limited in selecting metrics by the following factors.

1. The legislation required health facilities to collect data on health facility acquired infection rates for specific clinical procedures, including a cardiac (heart) surgery, an orthopedic (skeletal) surgery and infections related to central-line (tube in vein) devices.
2. Metrics had to be supported by the web-based reporting system specified in the legislation.

The department also recognized the federal Healthcare Infection Control Practices Advisory Committee's (HICPAC) recommendation to gradually implement any new public reporting system by incrementally introducing new reporting requirements. HICPAC is the nation's expert in infection control and serves as the advisory committee to the Centers for Disease Control (CDC) and the Secretary of the Department of Health and Human Services (HHS). The

HICPAC recommendation was important because it indicated that implementing a reporting system too quickly could contribute to poor data quality and data misinterpretation.

Taking into account these factors the committee and the department agreed that health facilities would
initially report on:

1. Heart bypass surgery;
2. Hip and knee replacement surgeries; and
3. Central-line associated bloodstream infections that develop in select intensive care units.

In 2008 the committee and the department added another metric. In July 2008 herniorrhaphy, or hernia procedures, were included into the reporting plan but will not be included in this report, as there was not enough data to show any significance between facilities.

Patient Safety Enhancement: Example 1

Many local facilities have begun implementation of an automatic stop order for urinary catheters. Their goal is to decrease unnecessary catheter days that will lead to the decrease of Catheter-Associated Urinary Tract Infections (CAUTI). Additionally, they have begun implementing specific daily rounds to view and evaluate all central lines. This assists in decreasing the overall infection rate per patient.

The committee is charged with recommending additional metrics that health facilities must report as the initiative continues to expand. A minimum of two additional clinical metrics will be selected in 2009 and 2010.

Surgical Site Infections

Surgical site infections (SSI) are infections that are directly related to an operative procedure. In an attempt to gradually implement the mandatory reporting program, the department is requiring facilities report on a limited number of cardiac and orthopedic surgical procedures.

SSI rates are adjusted to take into account differences in patient risk factors for infection due to length of the surgery, type of surgical wound and the patient's physical condition. Surgical procedures selected for SSI reporting are serious, are performed in a variety of facilities, and tend to be associated with health facility acquired infections.

Most SSIs from these types of surgeries can:

- Be prevented by following established prevention techniques;
- Easily be detected and reported accurately; and
- Have a devastating impact on the patient’s quality of life.

The decision to report on the specific SSI types was evidence-based. Some of the reasons to target these types of surgeries are they are:

- High volume procedures;
- Expensive for healthcare payers; and

- Performed at a number of health facilities in Colorado-often allowing consumers to choose where to receive treatment.

Central Line Associated Blood Stream Infections

Central line associated blood stream infections (CLABSI) are primary bloodstream infections that are associated with the presence of a central line or an umbilical catheter (tube in umbilical cord) in neonates at the time of or before the onset of the infection. 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. An example of a great vessel is the aorta or superior vena cava. A central line can be used to infuse fluids or withdraw blood in a patient. Central lines can be either temporary or permanent.

Central line surveillance can occur in four types of health facility locations:

1. Intensive care units;
2. Specialty care units;
3. Neonatal intensive care units; and
4. Any other patient care location in the institution.

Patient Safety Enhancement: Example 2

A local facility wanted to decrease infection rates primarily on CLABSI and Ventilator-Associated Pneumonia (VAP). A group nurses volunteered to take notes on opportunities for improvement to bring back to the administration. One of their initiatives involved a line care initiative with nursing that resulted in a dramatic decrease in rates between two quarters. They are still tracking the results and working on improvements.

Reporting CLABSI by unit type allows for a fairer comparison between hospitals. It takes into account differences in the type of patients intensive care units (ICUs) treat and the different risks for infection. The department chose locations one and three from the list above, targeting reporting from neonatal and certain adult ICUs.

Most CLABSI occurring in these facility locations can:

- Be prevented by following established prevention techniques;
- Easily be detected and reported accurately; and
- Have a devastating impact on the patient's quality of life.

Like the SSI metrics the decision to report on CLABSI acquired in specific health facility locations was evidence-based. CLABSIs often lead to additional days in the health facility, which can be expensive for healthcare payers, health facilities and patients. Evidence suggests that tracking CLABSI acquired in ICUs may lead to better adherence to preventive practices and decrease medical complications or death.

The law does not require health facilities to report on specific types of infection (e.g. Methicillin Resistant Staphylococcus Aureus; MRSA) or to report an overall facility infection rate, but

requires facilities to report infections that can be acquired based on specific procedures or while being cared for using specific devices. Reports present infection information grouped procedure rather then infection type. For example, future reports will not track all cases of MRSA, but will track MRSA cases that develop from a hip replacement surgery (or other procedure types that are reported).

Experts in the field of infection control, including the CDC (Centers for Disease Control and Prevention), have found that many procedures are performed in facility locations that have low infection rates. These experts recommend health facilities not attempt to collect an overall facility infection rate as this would divert resources from working to prevent infections in higher risk facility locations. As recommended, Colorado is requiring specific location and surgical procedure reporting, which will produce data elements that can be utilized by health facilities to target infection prevention and quality of care process improvements.

Phase 3: Provide Technical Assistance

The third phase of implementation began during phase one and is ongoing. For over a year the department and the advisory committee members have been working with health facilities across the state to educate them on the legislative requirements. This initiative is new ground for many stakeholders and has required that the department provide information to health facilities on their roles and responsibilities and the new reporting system. This education includes disclosure initiative explanation, system training, coaching and compliance monitoring details.

The department has partnered with a number of professional organizations to help implement the disclosure initiative. The Colorado Hospital Association, the Colorado Mile High Chapter of the Association for Professionals in Infection Control and Epidemiology and the Colorado Ambulatory Surgery Center Association have helped the department recruit committee members, train health facilities and disseminate important information to their membership base.

The department also has developed a patient safety initiatives section[1] on the department Web site. The department uses the Web site to disseminate information to health facilities and the public regarding the initiative, the advisory committee and general health facility acquired infections educational resources.

Reporting System

The National Healthcare Safety Network (NHSN) is a secure, internet-based surveillance system developed, administered and maintained by the CDC. The health facility acquired infections disclosure initiative in Colorado requires participating facilities use the NHSN system for reporting.

CDC initially opened NHSN enrollment to a limited number of facilities in 2005, followed by a national open enrollment for hospitals and outpatient hemodialysis centers in 2007. Up until October of 2008 ambulatory surgery centers were not able to submit data to NHSN.

[1] http://www.cdphe.state.co.us/hf/static/patientsafety.html

In Colorado, health facilities must enroll with and submit data to NHSN for public disclosure. Health facilities must grant the department access to their data so the department can monitor, analyze and produce public reports. According to the legislation, individuals who collect the surveillance data must have a Certification in Infection Control and Epidemiology[2] or become certified within six months of becoming eligible to take the certification test. Certification requirements do not apply to individuals collecting the data in hospitals with 50 beds or less.

NHSN is used nationally by many healthcare facilities to manage their infection data. The system integrates patient and healthcare personnel safety surveillance information from facilities across the nation. One of the enhanced features of this surveillance system is that while maintaining data security, integrity, and confidentiality, NHSN has the capacity for healthcare facilities to share data in a timely manner:

- Between a facility and public health agencies; and
- Between facilities (e.g., multihospital system).

While there is no charge for participation in NHSN, participation requires a significant commitment by each health facility. There is a lengthy, time-sensitive, five-step process to gain access to NHSN and each month participating health facilities must complete a NHSN reporting plan. To obtain infection rate information facilities must gather data on all the currently targeted procedures whether or not the procedure led to an infection.

Participating Facilities

This bill requires hospitals, hospital units, ambulatory surgery centers (ASC) and dialysis treatment centers (DTC) to report health facility acquired infections data to NHSN as a condition of their state licensure. As of November 2008, Colorado holds licenses for 87 hospitals, 3 hospital units, 108 ASCs and 55 DTCs, totaling 253 facilities targeted for reporting. ASCs are now able to report using NHSN, but are not included in this report as they began reporting in October 2008. A DTC procedure was not selected for the initial year, but DTCs are expected to report in future years. Of the 90 hospitals and hospital units, only 76 have indicated they perform any of the procedures selected for the initial reporting year. Of the 108 ASCs, only 36 have indicated they perform any of the procedures selected for the initial reporting year. Although a limited number of facilities are currently reporting, the department must still monitor and educate all 253 facilities regarding the initiative.

[2] The Certification Board of Infection Control and Epidemiology is an organization that certifies infection control practitioners based on their educational background and professional experience, in conjunction with testing their knowledge base through a standardized exam. The credential awarded is CIC, Certification in Infection Control and Epidemiology. One must have two years of infection control experience in order to sit for the boards. Certification must be renewed every five years.

Phase 4: Evaluate the Initiative

The evaluation process helped the department identify the following four challenges:

1. Committee participation
    - The department has aggressively sought committee membership, currently all positions are filled.
    - The department has recognized the need to develop processes to ensure committee involvement and satisfaction in order to maintain the level of dedication the inaugural committee has shown.
2. Reporting system
    - Colorado's mandatory reporting law requires health facilities report infections to the NHSN web-based database. The NHSN training and enrollment process can take up to two months. Any mistakes made during the enrollment process can result in having to re-enroll, thus beginning the lengthy enrollment process again. Although constrained by resource limitations the Colorado Hospital Association and the CDC have provided some assistance in training health facilities.
    - NHSN is a federally managed and funded reporting system. The addition of any reporting element in the NHSN system is determined by the availability of federal funds.
3. Limited resources
    - Many of the difficulties health facilities have experienced with the NHSN reporting system were due to limited time and resources. The department and the advisory committee have attempted to assist the facilities, but struggle with the same time and resource constraints.
    - The department is concerned that there are no resources designated to develop a state system that would ensure the accuracy and completeness of the data going into and being extracted from the reporting database.
        - Other states with mandatory health facility acquired infections reporting laws have designated money and resources to implement, oversee and validate the facility data collection processes.
            - For example, New York has a program director, program manager, data manager, data analyst, program operations director, an administrative assistant and five regionally based infection control professionals. New York also receives additional support from its Department of Health division directors and the CDC staff responsible for the NHSN reporting database.
            - The total number of reporting facilities in New York's 2007 report is 187 which is comparable to the 112 targeted for reporting in Colorado.
        - In contrast, Colorado primarily relies on one project manager to oversee the disclosure initiative with support from the volunteer advisory committee, department and division staff and the CDC staff responsible for the NHSN reporting database.

4. Reporting timeline
    - Due to issues identified above, not all the health facilities reporting year two metrics were doing so by the time this report was prepared in November 2008.
    - In 2008 the department has already released one report in January, a bulletin in July and October, all of which can be viewed on the website. Two bulletins will be released again in 2009 and another report set for January 2010.

The department and the advisory committee will continue to evaluate the health facility acquired infections disclosure initiative to identify areas for process and data quality improvements and to increase public awareness.

Phase 5: Report Results

The final phase of implementation is to develop a public report. As no comparable system has been in place there are no baseline data, and trend data is not yet available. The issue of data validation is a concern for the department and many stakeholder groups throughout Colorado. If facility specific data are entered incorrectly or are not complete the data may be skewed. For example, some of the procedures, such as hip or knee replacements, require ongoing monitoring for a full year to verify if a procedure related infection has occurred.

Prior to the release of the annual and semi-annual reports each facility included in the report will release their data to The Colorado Hospital Association (CHA). CHA will compile all the data and release it to the facilities prior to the departments' release. Before either report is released the department receives CHAs data to perform a cross check to create data verification. While both reports are good resources consumers should also utilize other resources such as their geographical location, insurance, referrals, friends and family when choosing their healthcare needs.

Health Facility Acquired Infections Report

Data

Disclosure

All of the data in this report was submitted to National Healthcare Safety Network (NHSN) by Colorado Hospitals which perform these procedures. The department depends on accurate information from reporting facilities and NHSN to produce these reports. The department does not perform data validation or audit facilities to ensure the data are complete.

The national unit rate is the average rate for all hospitals reporting to NHSN in 2006. The comparison is based on statistical significance. Statistical significance is the likelihood that a result did not happen by chance alone. In other words, there is a scientific reason why some hospitals have better or worse rates. For example, two hospitals may have zero infections, but if one hospital has a much greater number of central line days that hospital may actually have a better infection rate than the national infection rate because of the large number of central line days without any infections.

Experts in the field of infection control find many procedures are performed in facility locations that have low infection rates. These experts recommend health facilities not attempt to collect an overall facility infection rate as this would divert resources from working to prevent infections in higher risk facility locations. Many types of infections often lead to additional days in the hospital, which can be expensive for healthcare payers and healthcare organizations. Evidence suggests that tracking infections may lead to better adherence to preventive practices and decrease medical complications or death.

A resource consumers can utilize, along with this report, is the Hospital Report Card released by The Colorado Hospital Association. These reports are vital consumer tools that should be utilized along with other resources such as doctor referrals, insurance companies, friends, family and facilities located within their geographical location. The Hospital Report Card can be viewed at the following link www.cha.com. As infections are not the only adverse event that may happen to a consumer, it is important to weigh all factors in judging the quality of healthcare. Consumers should always consult with their doctor, hospital, family and friends before deciding where to receive care. Consumers should consider the experience of the facility, staff and other quality of care indicators in addition to the infection data below. These reports should be used as one of many quality evaluation tools and cannot, on its own, paint a complete picture of hospital care in Colorado.

This report is based on the national average received from the *National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007* and the *National Nosocomial Infections Surveillance (NNIS) System Report, data summary from January 1992 through June 2004, issued October 2004*. NSHN published its latest report, which was released near the end of November 2008. The department pulled the data from participating hospitals on November 7, 2008; therefore, the department was unable to include the new national rate in this report. For all future reports and bulletins the new NHSN report, which is a data summary for 2006 through 2007, will be used for comparison and national rates.

Surgical Site Infections

Surgical site infections (SSI) are infections that are directly related to an operative procedure. In an attempt to gradually implement the mandatory reporting program, the department is requiring facilities to report on a limited number of cardiac and orthopedic surgical procedures. The initial metrics will focus on:

Cardiac Surgeries

- Heart Bypass (Coronary Artery Bypass Grafts):
  Heart bypass or coronary artery bypass graft (CABG, pronounced cabbage) 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.

Orthopedic Surgeries

- Total or Partial Hip Replacements:
  Hip replacement is 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 involves removing the damaged cartilage and bone from the hip joint and replacing them with new, man-made parts.

- Total or Partial Knee Replacements:
  Knee replacement surgery (arthroplasty) is an elective procedure for people with severe knee damage and pain related to osteoarthritis, rheumatoid arthritis, and traumatic arthritis. A total knee replacement involves removing the damaged cartilage and bone from the surface of the knee joint and replacing them with a man-made surface of metal and plastic. A partial knee replacement involves replacing only part of the knee joint.

SSI rates are adjusted to take into account differences in patient risk factors for infection due to length of the surgery, type of surgical wound and the patient's physical condition. Surgical procedures selected for SSI reporting are serious, are performed in a variety of facilities, and tend to be associated with health facility acquired infections.

The Standardized Infection Ratio (SIR) is 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 hospital based on the expected number of infections after adjusting for the risk category.
It is the ratio of the observed to expected number of SSIs. Overall rates for SSIs should never be compared between facilities due to inherent differences between the patients.

Interpretation of the SIR is simplistic. A hospital's SIR value is compared to 1.0 (observed and expected number of SSIs are the same). If the SIR value is greater than 1.0, there are more infections than expected. If the SIR value is less than 1.0, then fewer infections occurred than expected. A statistical test (Z-test or Poisson test) is used to determine if the difference is statistically significant. For an example of how this calculation works please refer to Appendix D.

Cardiac Operative Procedures

Introduction

This section focuses on surgical site infections in cardiac operative procedures. These procedures are coronary artery bypass grafts with both chest and donor site incisions and coronary artery bypass grafts with chest incision only. The two tables show the results of data collected for surgical site infection by each cardiac operative procedure. The reporting period is from August 1, 2007 through July 31, 2008.

List of Tables

Surgical site infections; cardiac operative procedures

Surgical site infections (SSI) are infections that are directly related to an operative procedure. Surgical site infections in cardiac operative procedures are coronary artery bypass grafts with both chest and donor site incisions (CBGB) as well as coronary artery bypass grafts with chest incision only (CBGC). A CBGB is a chest procedure to perform direct revascularization of the heart which includes obtaining a suitable vein from the donor site for grafting. A CBGC is a chest procedure to perform direct vascularization of the heart using an artery, for example the internal mammary artery (thoracic).

The department requested facilities report surgical site infections by NHSN definitions and will show data for the:

Coronary artery bypass grafts with both chest and donor site incisions (CBGB); and
Coronary artery bypass grafts with chest incision only (CBGC).

Not every hospital will report CBGB and CBGC as only certain facilities perform these procedures. All hospitals that do report will follow up with the patient for one year to track infections with all implant procedures. Reporting CBGB and CBGC procedures separately will allow for fairer comparisons between hospitals as they are two separate procedures. Many of the SSIs that occur in these procedures can:

Be prevented by following established prevention techniques;
Easily be detected and reported accurately; and
Have a devastating impact on the patient's quality of life.

Evidence suggests that reporting of infections may lead to better adherence to preventive practices and decreases medical complications.

Results

The two tables below show facility specific data for SSIs attributed to the two different procedures performed, as described above. The tables contain data from August 1, 2007 through July 31, 2008, the first year of data since the initiative was instated.

Each table lists all the hospitals in Colorado that performed the procedure, the city where the hospital is located, the number of infections, the number of procedures performed, the standardized infection ratio (SIR) and comparison to the national infection rate. For the definition of SIR please refer back to page 11. The surgical infection rate is per 100 procedures. There are three categories summarizing how a Colorado hospital compares to the national infection rate for procedure performed:

1. Hospitals can have a statistically lower (better) infection rate than the national rate;
2. Hospitals can have an infection rate that is statistically the same as the national rate; or
3. Hospitals can have a statistically higher (worse) rate than the national rate.

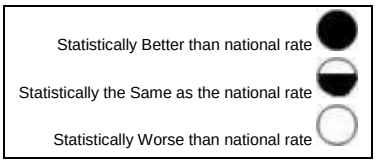


Table 1: Coronary Artery Bypass Grafts with both Chest and Donor Site Incisions (CBGB) Rates

Surgical Site Infections (SSI) in the Coronary Artery Bypass Grafts with both Chest and Donor Site Incisions (CBGB) Reporting Period: August 01, 2007 - July 31, 2008					
Health Facility	**Location**	**Infection Count**	**Procedure Count**	**SIR**	**National Comparison**
Boulder Community Hospital	Boulder	3	102	0.61	
Centura Penrose St Francis Health	Colorado Springs	4	120	0.76	
Centura Porter Adventist Hospital	Denver	2	80	0.68	
Centura St Anthony Central Hospital	Denver	1	55	0.37	
Exempla Lutheran Medical Center	Wheat Ridge	0	63	0	
Exempla Saint Joseph Hospital	Denver	1	274	0.08	
Longmont United Hospital	Longmont	4	62	1.25	
Medical Center Of Aurora	Aurora	2	51	0.84	
Medical Center Of The Rockies	Loveland	2	220	0.19	
Memorial Hospital Central	Colorado Springs	3	216	0.41	
North Colorado Medical Center	Greeley	1	74	0.31	
Parkview Medical Center	Pueblo	1	88	0.31	
Presbyterian/St Luke's Medical Ctr.	Denver	0	40	0	
Rose Medical Center	Denver	1	25	1.18	
Sky Ridge Medical Center	Lone Tree	1	32	0.75	
St Mary's Hospital	Grand Junction	0	160	0	
Swedish Medical Center	Englewood	***	10	***	***
University Of Colorado Hospital	Aurora	2	64	0.7	

Comparison to the national rate calculated from NHSN participating hospitals in 2006.

See *National Nosocomial Infections Surveillance (NNIS) System Report, data summary from January 1992 through June 2004, issued October 2004* for reference

*** Infections data for hospitals with less than 20 procedures performed in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.

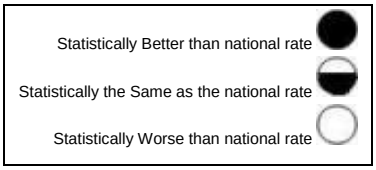
Table 2: Coronary Artery Bypass Grafts with Chest Incision Only (CBGC) Rates

Surgical Site Infections (SSI) in the Coronary Artery Bypass Grafts with Chest Incision Only (CBGC) Reporting Period: August 01, 2007 - July 31, 2008					
Health Facility	**Location**	**Infection Count**	**Procedure Count**	**SIR**	**National Comparison**
Boulder Community Hospital	Boulder	***	6	***	***
Centura Penrose St Francis Health	Colorado Springs	***	17	***	***
Centura Porter Adventist Hospital	Denver	***	20	***	***
Centura St Anthony Central Hospital	Denver	0	70	0	
Exempla Lutheran Medical Center	Wheat Ridge	***	2	***	***
Exempla Saint Joseph Hospital	Denver	***	8	***	***
Longmont United Hospital	Longmont	***	8	***	***
Medical Center Of Aurora	Aurora	0	28	0	
Memorial Hospital Central	Colorado Springs	1	29	1.32	
North Colorado Medical Center	Greeley	***	7	***	***
Parkview Medical Center	Pueblo	***	2	***	***
Presbyterian/St Luke's Medical Ctr.	Denver	0	47	0	
Rose Medical Center	Denver	***	1	***	***
Sky Ridge Medical Center	Lone Tree	***	2	***	***
Swedish Medical Center	Englewood	0	53	0	
University Of Colorado Hospital	Aurora	***	5	***	***

Comparison to the national rate calculated from NHSN participating hospitals in 2006.

See *National Nosocomial Infections Surveillance (NNIS) System Report, data summary from January 1992 through June 2004, issued October 2004* for reference

*** Infections data for hospitals with less than 20 procedures performed in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.



Orthopedic Operative Procedures

Introduction

This section focuses on surgical site infections in orthopedic operative procedures. These procedures are hip replacement (total or partial) and knee replacement (total or partial). The two tables show the results of data collected in each surgical site infection by each orthopedic operative procedure. The reporting period is from August 1, 2007 through July 31, 2008.

List of Tables:

Surgical site infections; orthopedic operative procedures

Surgical site infections (SSI) are infections that are directly related to an operative procedure. Surgical site infections in orthopedic operative procedures are hip prosthesis (total or partial) and knee prosthesis (total or partial). A hip prosthesis is hip joint replacement surgery that replaces all or part of the hip joint with an artificial device. The procedure consists of a cup, which is typically plastic, ceramic or metal that will replace the hip socket; a metal or ceramic ball that replaces the fractured head of the thigh bone and finally a metal stem that attaches to the bone. Knee prosthesis is a knee joint replacement that replaces all or part of the knee joint 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. Infections can occur at the site of the incision typically within the first 30 days of the procedure. Symptoms of an infection can include drainage from the incision, pain, tenderness, swelling, or redness.

The department requested facilities report surgical site infections by NHSN definitions and show data for the:

Hip Prosthesis (total or partial); and
Knee Prosthesis (total or partial).

Not every hospital will report hip and knee prosthesis as only certain facilities perform these procedures. All hospitals that do report will follow up with the patient for one year to track infections with all implant procedures. Reporting hip and knee procedures separately will allow for fairer comparisons between hospitals as they are two separate procedures. Many of the SSIs that occur in these procedures can:

Be prevented by following established prevention techniques;

Easily be detected and reported accurately; and

Have a devastating impact on the patient's quality of life.

Evidence suggests that reporting of infections may lead to better adherence to preventive practices and decrease medical complications.

Results

The two tables below show facility specific data for SSIs attributed to the two different procedures performed, as described above. The tables contain data from August 1, 2007 through July 31, 2008, the first year of data since the initiative began.

Each table lists all the hospitals in Colorado that performed the procedure, the city where the hospital is located, the number of infections, the number of procedures preformed, the standardized infection ratio (SIR) and the national infection rate for the procedure. The surgical infection rate is per 100 procedures. There are three categories summarizing how a Colorado hospital compares to the national infection rate for procedure performed:

1. Hospitals can have a statistically lower (better) infection rate than the national rate;
2. Hospitals can have an infection rate that is statistically the same as the national rate; or
3. Hospitals can have a statistically higher (worse) rate than the national rate.

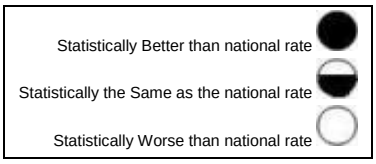


Table 3: Hip Replacement (total or partial) (HPRO) Rates

Surgical Site Infections (SSI) in the Hip Procedure (total or partial) (HPRO) Reporting Period: August 01, 2007 - July 31, 2008					
Health Facility	**Location**	**Infection Count**	**Procedure Count**	**SIR**	**National Comparison**
Animas Surgical Hospital	Durango	0	21	0	
Aspen Valley Hospital	Aspen	***	13	***	***
Boulder Community Hospital	Boulder	2	258	0.62	
Centura Avista Adventist Hospital	Louisville	4	110	2.87	
Centura Littleton Adventist Hospital	Littleton	1	79	0.89	
Centura Penrose St Francis Health	Colorado Springs	3	423	0.48	
Centura Porter Adventist Hospital	Denver	5	523	0.78	
Centura St Anthony Central Hospital	Denver	4	234	1.22	
Centura St Anthony North Hospital	Westminster	1	54	1.16	
Centura St Mary Corwin Med. Ctr.	Pueblo	0	65	0	
Centura St Thomas More Hospital	Canon City	0	35	0	
Children's Hospital	Aurora	***	14	***	***
Colorado Mental Health Institute	Pueblo	***	1	***	***
Colorado Plains Medical Center	Fort Morgan	***	12	***	***
Community Hospital	Grand Junction	2	79	1.72	
Delta County Memorial Hospital	Delta	3	52	4.65	
Denver Health Medical Center	Denver	3	69	3.04	
East Morgan County Hospital	Brush	***	8	***	***

Exempla Good Samaritan Med. Ctr.	Lafayette	2	225	0.66	
Exempla Lutheran Medical Center	Wheat Ridge	2	412	0.41	
Exempla Saint Joseph Hospital	Denver	2	328	0.31	
Grand River Medical Center	Rifle	***	2	***	***
Longmont United Hospital	Longmont	2	101	1.08	
McKee Medical Center	Loveland	0	113	0	
Medical Center Of Aurora	Aurora	3	245	1.02	
Medical Center Of The Rockies	Loveland	0	37	0	
Memorial Hospital Central	Colorado Springs	5	381	0.75	
Memorial Hospital North	Colorado Springs	0	82	0	
Memorial Hospital	Craig	***	14	***	***
Mercy Regional Medical Center	Durango	0	81	0	
Montrose Memorial Hospital	Montrose	0	58	0	
North Colorado Medical Center	Greeley	2	133	0.93	
North Suburban Medical Center	Thornton	0	44	0	
Parker Adventist Hospital	Parker	0	32	0	
Parkview Medical Center Inc	Pueblo	1	141	0.46	
Pikes Peak Regional Hospital	Woodland Park	***	1	***	***
Platte Valley Medical Center	Brighton	***	15	***	***
Poudre Valley Hospital	Fort Collins	2	401	0.35	
Presbyterian/St Luke's Medical Ctr.	Denver	1	241	0.3	
Rose Medical Center	Denver	1	328	0.23	
San Luis Valley Regional Med. Ctr.	Alamosa	0	28	0	
Sky Ridge Medical Center	Lone Tree	2	137	1.18	
Southwest Memorial Hospital	Cortez	1	30	2.07	
St Anthony Summit Medical Center	Frisco	***	8	***	***
St Mary's Hospital	Grand Junction	1	223	0.32	
Sterling Regional Med. Ctr.	Sterling	4	28	9.23	
Swedish Medical Center	Englewood	1	159	0.5	
University Of Colorado Hospital	Aurora	3	260	0.79	
Vail Valley Medical Center	Vail	0	40	0	
Valley View Hospital	Glenwood Springs	0	54	0	
Wray Community District Hospital	Wray	***	1	***	***
Yampa Valley Medical Center	Steamboat Springs	1	46	1.48	

Comparison to the national rate calculated from NHSN participating hospitals in 2006.

See *National Nosocomial Infections Surveillance (NNIS) System Report, data summary from January 1992 through June 2004, issued October 2004* for reference

*** Infections data for hospitals with less than 20 procedures performed in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Table 4: Knee Replacement (total or partial) (KPRO)

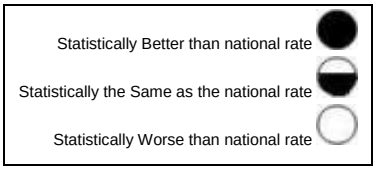
Surgical Site Infections (SSI) in the Knee Procedure (total or partial) (KPRO) Reporting Period: August 01, 2007 - July 31, 2008					
Health Facility	**Location**	**Infection Count**	**Procedure Count**	**SIR**	**National Comparison**
Animas Surgical Hospital	Durango	0	41	0	
Aspen Valley Hospital	Aspen	***	12	***	***
Boulder Community Hospital	Boulder	0	177	0	
Centura Avista Adventist Hospital	Louisville	6	188	2.72	
Centura Littleton Adventist Hospital	Littleton	3	92	2.79	
Centura Penrose St Francis Health	Colorado Springs	3	574	0.43	
Centura Porter Adventist Hospital	Denver	8	979	0.75	
Centura St Anthony Central Hospital	Denver	5	271	1.62	
Centura St Anthony North Hospital	Westminster	0	74	0	
Centura St Mary Corwin Med. Ctr.	Pueblo	3	114	1.73	
Centura St Thomas More Hospital	Canon City	0	84	0	
Children's Hospital	Aurora	***	6	***	***
Colorado Mental Health Institute	Pueblo	***	1	***	***
Colorado Plains Medical Center	Fort Morgan	1	33	1.93	
Community Hospital	Grand Junction	0	110	0	
Delta County Memorial Hospital	Delta	0	92	0	
Denver Health Medical Center	Denver	2	75	2.21	
East Morgan County Hospital	Brush	***	10	***	***
Exempla Good Samaritan Med. Ctr.	Lafayette	0	362	0	
Exempla Lutheran Medical Center	Wheat Ridge	5	775	0.64	
Exempla Saint Joseph Hospital	Denver	5	701	0.43	
Heart Of The Rockies Regional Med. Ctr.	Salida	***	4	***	***
Kremmling Memorial Hospital	Kremmling	***	7	***	***
Longmont United Hospital	Longmont	1	168	0.41	
McKee Medical Center	Loveland	2	182	0.88	
Medical Center Of Aurora	Aurora	4	390	0.91	
Medical Center Of The Rockies	Loveland	1	50	1.38	
Memorial Hospital Central	Colorado Springs	6	707	0.59	
Memorial Hospital North	Colorado Springs	0	282	0	
Memorial Hospital	Craig	***	14	***	***
Mercy Regional Med. Ctr.	Durango	0	82	0	
Montrose Memorial Hospital	Montrose	2	88	1.73	
North Colorado Med. Ctr.	Greeley	5	283	1.32	
North Suburban Med. Ctr.	Thornton	1	80	1.05	
Parker Adventist Hospital	Parker	0	27	0	
Parkview Medical Center	Pueblo	2	308	0.51	
Pikes Peak Regional Hospital	Woodland Park	***	5	***	***

Platte Valley Med. Ctr.	Brighton	0	48	0	
Poudre Valley Hospital	Fort Collins	7	733	0.81	
Presbyterian/St Luke's Med. Ctr.	Denver	2	316	0.54	
Rose Medical Center	Denver	3	533	0.5	
San Luis Valley Regional Med. Ctr.	Alamosa	1	37	2.06	
Sky Ridge Medical Center	Lone Tree	2	217	0.76	
Southwest Memorial Hospital	Cortez	0	36	0	
St Anthony Summit Med. Ctr.	Frisco	***	15	***	***
St Mary's Hospital	Grand Junction	2	295	0.55	
Sterling Regional Med. Ctr.	Sterling	2	32	4.15	
Swedish Medical Center	Englewood	8	337	2.22	
University Of Colorado Hospital	Aurora	1	290	0.29	
Vail Valley Medical Center	Vail	0	117	0	
Valley View Hospital Association	Glenwood Springs	0	97	0	
Wray Community Hospital	Wray	***	6	***	***
Yampa Valley Med. Ctr.	Steamboat Springs	2	82	2.04	

Comparison to the national rate calculated from NHSN participating hospitals in 2006.

See *National Nosocomial Infections Surveillance (NNIS) System Report, data summary from January 1992 through June 2004, issued October 2004* for reference

*** Infections data for hospitals with less than 20 procedures performed in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.



Catheter Associated Bloodstream Infection Rates:

Adult Intensive Care Units

Introduction

This section of the report focuses on central line associated bloodstream infections acquired in five adult intensive care units (ICUs). The five tables in this bulletin show the results of data collected in each ICU type and contain data from August 1, 2007 through July 31, 2008.

List of Tables

Central line associated bloodstream infections

Central line associated blood stream infections (CLABSIs) are primary bloodstream infections that are associated with the presence of a central line at the time of or before the onset of an infection. 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. An example of a great vessel is the aorta or superior vena cava. A central line can be used to infuse fluids or withdraw blood in patients. Central lines can be either temporary or permanent.

The department requested facilities report CLABSIs by NHSN defined units. The information in this bulletin will cover central lines in the following units:

Adult Medical/Surgical Intensive Care;
Adult Medical Cardiac Intensive Care;
Adult Surgical Cardiothoracic Intensive Care;
Adult Medical Intensive Care; and
Adult Surgical Intensive Care.

Not every hospital will have all five intensive care units. Hospitals decide which type of ICU they have by measuring the type of patients that are cared for in that area and applying what is called the 80/20 rule. For instance, the medical ICU serves non-surgical patients, so if a facility finds that 80 percent of their critical care patients are non-surgical that facility would have a medical ICU, according to NHSN definitions. Facilities that handle 80 percent or more trauma patients in a particular ICU are not required to report for that ICU. The department is not reporting trauma information as patients in these areas have unique risk factors and complications are often less preventable.

Reporting CLABSIs by unit type allows for fairer comparisons between hospitals. It takes into account differences in the type of patients ICUs treat and the different risks for infection. Most CLABSIs that occur in these facility locations can:

Be prevented by following established prevention techniques;

Easily be detected and reported accurately; and

Have a devastating impact on the patient's quality of life.

Results

The five tables below show facility specific data for CLABSIs attributed to the five ICU types discussed above. Results are presented separately for each type of ICU. The tables contain data from August 1, 2007 through July 31, 2008 (the first year of data since the initiative began).

Each table lists all the hospitals in Colorado with that type of intensive care unit, the city where the hospital is located, the number of central line days in the unit, the number of infections in the unit, the infection rate for the unit and a comparison to the national infection rate for that unit. The number of central line days is the total number of days a central line was used in the ICU during the reporting period. The central line associated bloodstream infection rate is the number of infections per 1,000 central line days. There are three categories summarizing how a Colorado hospital compares to the national infection rate for that ICU:

1. Hospitals can have a statistically lower (better) infection rate than the national unit rate;
2. Hospitals can have an infection rate that is statistically the same as the national unit rate; or
3. Hospitals can have a statistically higher (worse) infection rate than the national unit rate.

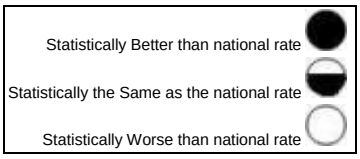


Table 5: Adult Medical Cardiac ICU CLABSI Rates

The adult medical cardiac critical care location is an intensive care unit (ICU) that specializes in care of patients with serious heart problems that do not require heart surgery.

Central Line Associated Bloodstream Infections (CLABSI) in the Adult Medical Cardiac Critical Care Reporting Period: August 01, 2007 - July 31, 2008						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Exempla Lutheran Med. Ctr.	Wheat Ridge	1,605	1	0.6	2.8	
Memorial Hospital Central	Colorado Springs	1,832	0	0	2.8	
North Colorado Med. Ctr.	Greeley	2,219	0	0	2.8	
University Of Colorado Hospital	Aurora	1,143	4	3.5	2.8	

Comparison to the national rate calculated from NHSN participating hospitals in 2006.

See *National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007* for reference

*** Infections data for hospitals with less than 50 central line days in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Table 6: Adult Surgical Cardiothoracic ICU CLABSI Rates

The adult medical cardiothoracic critical care location is an intensive care unit (ICU) that specializes in care of patients following cardiac and thoracic surgery (i.e., surgeries on the organs within the chest-like the heart or lungs).

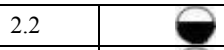
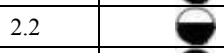
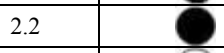
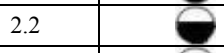
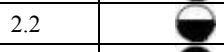
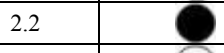
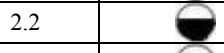
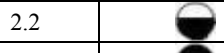
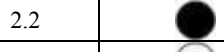
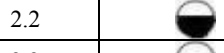
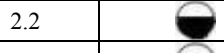
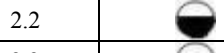
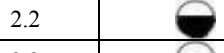
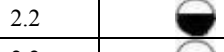
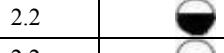
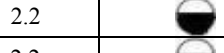
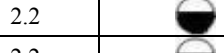
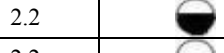
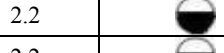
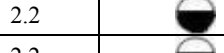
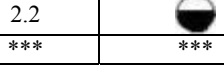
Central Line Associated Bloodstream Infections (CLABSI) in the Adult Surgical Cardiothoracic Critical Care Reporting Period: August 01, 2007 - July 31, 2008						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Centura St Anthony Central Hospital	Denver	1,684	1	0.6	1.6	
St Mary's Hospital	Grand Junction	1,361	0	0	1.6	

Comparison to the national rate calculated from NHSN participating hospitals in 2006.
See *National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007* for reference
*** Infections data for hospitals with less than 50 central line days in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Table 7: Adult Medical/Surgical ICU CLABSI Rates

The adult medical/surgical critical care location is an intensive care unit (ICU) for critically ill patients who are being treated for medical conditions, surgical conditions or both.

Central Line Associated Bloodstream Infections (CLABSI) in the Adult Medical/Surgical Critical Care Reporting Period: August 01, 2007 - July 31, 2008						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Arkansas Valley Regional Med. Ctr.	La Junta	129	0	0	2.2	
Aspen Valley Hospital	Aspen	43	***	***	***	***
Boulder Community Hospital	Boulder	2,042	3	1.5	2.2	
Centura Avista Adventist Hospital	Louisville	803	2	2.5	2.2	
Centura Littleton Adventist Hospital	Littleton	186	0	0	2.2	
Centura Penrose St Francis Health	Colorado Springs	4,148	4	1	2.2	
Centura Porter Adventist Hospital	Denver	4,658	6	1.3	2.2	
Centura St Mary Corwin Med. Ctr.	Pueblo	2,162	2	0.9	2.2	
Centura St Thomas More Hospital	Canon City	130	0	0	2.2	
Colorado Plains Med. Ctr.	Fort Morgan	132	0	0	2.2	
Community Hospital	Grand Junction	525	1	1.9	2.2	
Delta County Memorial Hospital	Delta	27	***	***	***	***
Exempla Good Samaritan Med. Ctr.	Lafayette	2,171	3	1.4	2.2	
Exempla Lutheran Med. Ctr.	Wheat Ridge	2,733	2	0.7	2.2	
Exempla Saint Joseph Hospital	Denver	5,421	2	0.4	2.2	
Gunnison Valley Hospital	Gunnison	2	***	***	***	***
Heart Of The Rockies Reg. Med. Ctr.	Salida	45	***	***	***	***
Longmont United Hospital	Longmont	2,551	1	0.4	2.2	
McKee Medical Center	Loveland	551	2	3.6	2.2	
Medical Center Of Aurora	Aurora	5,772	6	1	2.2	

Medical Center Of The Rockies	Loveland	1,322	0	0	2.2	
Medical Center Of The Rockies	Loveland	1,711	2	1.2	2.2	
Memorial Hospital Central	Colorado Springs	4,853	1	0.2	2.2	
Mercy Regional Med. Ctr.	Durango	1,153	0	0	2.2	
Montrose Memorial Hospital	Montrose	266	0	0	2.2	
North Colorado Med. Ctr.	Greeley	2,275	0	0	2.2	
North Suburban Med. Ctr.	Thornton	1,760	1	0.6	2.2	
Parker Adventist Hospital	Parker	214	1	4.7	2.2	
Parkview Medical Center	Pueblo	1,885	0	0	2.2	
Poudre Valley Hospital	Fort Collins	1,602	2	1.2	2.2	
Presbyterian/St Luke's Med. Ctr.	Denver	2,781	9	3.2	2.2	
Rose Medical Center	Denver	2,786	2	0.7	2.2	
San Luis Valley Regional Med. Ctr.	Alamosa	274	0	0	2.2	
Sky Ridge Medical Center	Lone Tree	2,658	7	2.6	2.2	
Southwest Memorial Hospital	Cortez	120	0	0	2.2	
St Anthony Summit Med. Ctr.	Frisco	124	0	0	2.2	
St Mary's Hospital	Grand Junction	1,287	2	1.6	2.2	
Sterling Regional Med. Ctr.	Sterling	131	0	0	2.2	
Swedish Medical Center	Englewood	8,910	15	1.7	2.2	
Vail Valley Med. Ctr.	Vail	160	0	0	2.2	
Valley View Hospital	Glenwood Springs	309	0	0	2.2	
Yampa Valley Med. Ctr.	Steamboat Springs	41	***	***	***	***

Comparison to the national rate calculated from NHSN participating hospitals in 2006.
See *National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007* for reference
*** Infections data for hospitals with less than 50 central line days in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Table 8: Adult Medical ICU CLABSI Rates

The adult medical critical care location is an intensive care unit (ICU) for patients who are being treated for non-surgical conditions.

Central Line Associated Bloodstream Infections (CLABSI) in the Adult Medical Critical Care Reporting Period: August 01, 2007 - July 31, 2008						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Boulder Community Hospital- Foothills	Boulder	60	0	0	2.9	
Centura Littleton Adventist Hospital	Littleton	2,561	1	0.4	2.9	
Centura St Anthony Central Hospital	Denver	2,406	0	0	2.9	
Centura St Anthony North Hospital	Westminster	2,864	5	1.7	2.9	
Denver Health Med. Ctr.	Denver	3,601	3	0.8	2.9	
Platte Valley Medical Center	Brighton	361	1	2.8	2.9	
University Of Colorado Hospital	Aurora	3,625	13	3.6	2.9	

Comparison to the national rate calculated from NHSN participating hospitals in 2006.
See *National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007* for reference

*** Infections data for hospitals with less than 50 central line days in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Table 9: Adult Surgical ICU CLABSI Rates

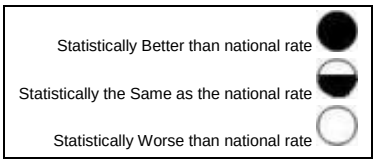
The adult surgical critical care location is an intensive care unit (ICU) for the evaluation and management of patients with serious illness before and/or after surgery.

Central Line Associated Bloodstream Infections (CLABSI) in the Adult Surgical Critical Care Reporting Period: August 01, 2007 - July 31, 2008						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
University Of Colorado Hospital	Aurora	3,435	13	3.8	2.7	

Comparison to the national rate calculated from NHSN participating hospitals in 2006.

See *National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007* for reference

*** Infections data for hospitals with less than 50 central line days in a twelve month period is suppressed to protect confidential health information. These hospitals have met the reporting requirements.



Catheter Associated Bloodstream Infection Rates:

Neonatal Intensive Care Units

Introduction

This section of the report focuses on catheter associated bloodstream infections acquired in level III and level II/III combined critical care newborn nurseries or what is called a neonatal intensive care unit (NICU). The two tables show the results of data collected in each NICU level by birth weight. The reporting period is from August 1, 2007 through July 31, 2008.

List of Tables

Catheter associated bloodstream *infections*

Central line catheter or umbilical catheter associated bloodstream infections are primary bloodstream infections associated with the presence of a catheter at the time of or before the onset of an infection. A central line is an intravascular catheter that terminates at or close to the heart or in one of the great vessels (i.e., a tube placed in a vein). An example of a great vessel is the aorta or superior vena cava. An umbilical catheter is a central vascular catheter inserted through the umbilical artery or vein in a neonate (i.e., a tube placed in the umbilical cord). Both catheter types are used to temporarily or permanently infuse fluids or withdraw blood in patients. In this report we will only be reporting on central line catheters.

The department requested facilities report catheter associated bloodstream infections by NHSN defined units and the information in this bulletin will show data for the:

Neonatal Level III Intensive Care Unit; and
Neonatal Level II/III Combined Intensive Care Unit.

Hospitals listed in this report all have designated level III neonatal intensive care units (NICUs). Level III NICUs handle the sickest newborn infants, while level I units would care for healthy newborn infants. Level III NICUs are organized with personnel and equipment to provide continuous life support and comprehensive care for extremely high-risk newborn infants and those with complex critical illness. Level III NICUs have a neonatologist on duty at all times. Neonatologists are pediatricians who have special training to deal with diseases and care of newborn infants.

The designation between level III or level II/III is defined by the NHSN reporting guidelines. If a hospital is not able to separate the infants in the unit that are receiving level II care and those receiving level III care that hospital is required to report data as a level II/III combined NICU.

Reporting NICU data by care level, birth weight and catheter type allows for fairer comparisons between hospitals as it takes into account how differences in care and patients' risk for infection lead to differences in infection rates. Many of the catheter associated bloodstream infections that occur in these facility locations can:

Be prevented by following established prevention techniques;
Easily be detected and reported accurately; and
Have a devastating impact on the patient's quality of life.

Results

The first of the two tables shows information on central line associated bloodstream infections in level III units, while the second displays data from level II/III combined units. Both tables contain results separated into the birth weight categories shown below:

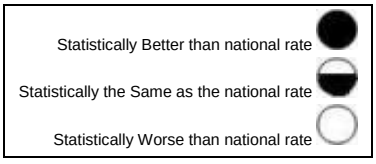
1. Less than or equal to 1.65 pounds (≤750 grams);
2. 1.66 to 2.2 pounds (751-1,000 grams);
3. 2.3 to 3.3 pounds (1,001-1,500 grams);
4. 3.4 to 5.5 pounds (1,501-2,500 grams); and
5. Greater than 5.5 pounds (>2,500).

The weight is that of the infant at the time of birth and does not reflect changes during the hospital stay. For example, if a newborn infant weighs 1.66 pounds at birth but remains in the NICU for two months and has a body weight of 3.3 pounds when it develops an infection, the recorded birth weight would still be 1.66 pounds.

Each table lists the hospital name, the city where the hospital is located, the number of central line catheter days in the unit, the number of infections in the unit, the infection rate for the unit, the national infection rate and a comparison to the national infection rate. National data is unique for each unit level and birth weight. The number of catheter days is the total number of days a catheter was used in the NICU during the reporting period. The infection rate is the number of infections per 1,000 catheter days.

There are three categories summarizing how a Colorado hospital compares to the national infection rate for that NICU:

1. Hospitals can have a statistically lower (better) infection rate than the national rate;
2. Hospitals can have an infection rate that is statistically the same as the national rate; or
3. Hospitals can have a statistically higher (worse) infection rate than the national rate.



Results shown below focus on central line associated bloodstream infections (CLABSIs) only and not umbilical catheter associated bloodstream infections. The department reviewed the umbilical catheter associated bloodstream infections data and found only two infections for the 7,775 catheter days reported in all 17 hospitals across the state.

Cautions

There are some cautions consumers should be aware of when interpreting the data in this report. Some medical conditions in newborn infants predispose them to bloodstream infections whether they have a catheter in place or not. This means that the catheter may not be the reason the blood got infected. However, because the patient has a catheter in place when this infection happens it is counted as a bloodstream infection. For example, bloodstream infections in infants with major intestinal problems are common because bacteria in the intestine can access the bloodstream more easily.

Another limitation of the definition used to report bloodstream infections in newborn infants is that it includes a category called clinical sepsis. This requires that a patient's medical chart be checked each day for key signs and symptoms of infection. This is a labor-intensive data collection process and hospitals with electronic record systems can more efficiently scan their records by generating automated reports. This efficiency can result in more accurate data collection and higher reported infection rates.

Table 10: Neonatal ICU Level III CLABSI Rates

Central line associated bloodstream infections in the critical care area for newborns and infants with a serious illness requiring level III care.

Central Line Associated Bloodstream (CLABS1) in the Neonate Critical Care level III						
Birth Weight: equal to or less than 1.65 pounds (<=750g)						
Reporting Period: August 01, 2007 - July 31, 2008						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Centura Lttleton Adventist Hospital	Littleton	19	***	***	***	***
Children's Hospital	Aurora	497	5	10.1	6.4	
Exempla Saint Joseph Hospital	Denver	197	2	10.2	6.4	
Memorial Hospital Central	Colorado Springs	663	7	10.6	6.4	
Presbyterian/St Luke's Med. Ctr.	Denver	878	1	1.1	6.4	
St Mary's Hospital	Grand Junction	28	***	***	***	***
Birth Weight: 1.66 - 2.2 pounds (751-1000g)						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Centura Littleton Adventist Hospital	Littleton	32	***	***	***	***
Children's Hospital	Aurora	734	8	10.9	4.4	
Exempla Saint Joseph Hospital	Denver	252	0	0	4.4	
Memorial Hospital Central	Colorado Springs	412	3	7.3	4.4	
Presbyterian/St Luke's Med. Ctr.	Denver	617	2	3.2	4.4	
St Mary's Hospital	Grand Junction	67	0	0	4.4	
Birth Weight: 2.3 - 3.3 pounds (1001-1500g)						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Centura Lttleton Adventist Hospital	Littleton	110	0	0	4.8	

Children's Hospital	Aurora	491	3	6.1	4.8	
Exempla Saint Joseph Hospital	Denver	100	1	10	4.8	
Memorial Hospital Central	Colorado Springs	707	4	5.7	4.8	
Presbyterian/St Luke's Med. Ctr.	Denver	409	2	4.9	4.8	
St Mary's Hospital	Grand Junction	77	0	0	4.8	

Birth Weight: 3.4-5.5 pounds (1501-2500g)

Health Facility	Location	Central Line Days	CLABSI	CLABSI Rate	National Rate	National Comparison
Centura Littleton Adventist Hospital	Littleton	11	***	***	***	***
Children's Hospital	Aurora	1355	5	3.7	4.2	
Exempla Saint Joseph Hospital	Denver	157	0	0	4.2	
Memorial Hospital Central	Colorado Springs	315	1	3.2	4.2	
Presbyterian/St Luke's Med. Ctr.	Denver	404	0	0	4.2	
St Mary's Hospital	Grand Junction	125	0	0	4.2	

Birth Weight: greater than 5.5 pounds (>2500g)

Health Facility	Location	Central Line Days	CLABSI	CLABSI Rate	National Rate	National Comparison
Centura Littleton Adventist Hospital	Littleton	4	***	***	***	***
Children's Hospital	Aurora	1384	6	4.3	3.1	
Exempla Saint Joseph Hospital	Denver	131	0	0	3.1	
Memorial Hospital Central	Colorado Springs	319	0	0	3.1	
Presbyterian/St Luke's Med. Ctr.	Denver	243	1	4.1	3.1	
St Mary's Hospital	Grand Junction	175	0	0	3.1	

*In January 2008, NHSN changed the criteria for laboratory confirmed bloodstream infections. National rates provided by NHSN are based on the criteria used before January 2008. Adjustments will be made to the data in order to compensate for criteria changes when new national rates become available.

Comparison to the national rate calculated from NHSN participating hospitals in 2006.

See *National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007* for reference

**Facility central line infection rate for NICU level and weight category.

-----Infection data for hospitals with less than 50 central line days in a 12 month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements

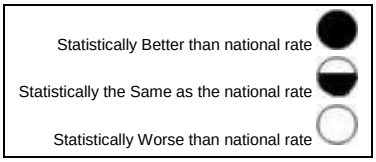


Table 11: Neonatal ICU Level II/III CLABSI Rates

Central line associated bloodstream infections in the critical care area for newborns and infants with a serious illness requiring level II or III care.

Central Line Associated Bloodstream (CLABS1) in the Neonate Critical Care level II/III combined						
Birth Weight: equal to or less than 1.65 pounds (<=750g)						
Reporting Period: August 01, 2007 - July 31, 2008						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Rose Medical Center	Denver	83	0	0	5.9	
Swedish Medical Center	Englewood	7	***	***	***	***
University Of Colorado Hospital	Aurora	538	2	3.7	5.9	
Birth Weight: 1.66 - 2.2 pounds (751-1000g)						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Centura Penrose St Francis Health	Colorado Springs	60	0	0	5.2	
Denver Health Med. Ctr.	Denver	229	0	0	5.2	
Rose Medical Center	Denver	74	0	0	5.2	
Swedish Medical Center	Englewood	56	0	0	5.2	
University Of Colorado Hospital	Aurora	178	0	0	5.2	
Birth Weight: 2.3 - 3.3 pounds (1001-1500g)						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Centura Avista Adventist Hospital	Louisville	21	***	***	***	***
Centura Penrose St Francis Health	Colorado Springs	34	***	***	***	***
Denver Health Med. Ctr.	Denver	455	1	2.2	3.4	
Exempla Lutheran Med. Ctr.	Wheat Ridge	94	0	0	3.4	
Parker Adventist Hospital	Parker	10	***	***	***	***
Poudre Valley Hospital	Fort Collins	83	0	0	3.4	
Rose Medical Center	Denver	47	***	***	***	***
Swedish Medical Center	Englewood	32	***	***	***	***
University Of Colorado Hospital	Aurora	491	2	4.1	3.4	
Birth Weight: 3.4-5.5 pounds (1501-2500g)						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Centura Avista Adventist Hospital	Louisville	9	***	***	***	***
Centura Penrose St Francis Health	Colorado Springs	6	***	***	***	***
Denver Health Med. Ctr.	Denver	248	0	0	2.4	
Exempla Lutheran Med. Ctr.	Wheat Ridge	5	***	***	***	***
Parker Adventist Hospital	Parker	58	0	0	2.4	
Poudre Valley Hospital	Fort Collins	94	0	0	2.4	
Rose Medical Center	Denver	48	***	***	***	***
Swedish Medical Center	Englewood	17	***	***	***	***
University Of Colorado Hospital	Aurora	205	1	4.9	2.4	

Birth Weight: greater than 5.5 pounds (>2500g)						
Health Facility	**Location**	**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Centura Penrose St Francis Health	Colorado Springs	7	***	***	***	***
Denver Health Med. Ctr.	Denver	48	***	***	***	***
Parker Adventist Hospital	Parker	33	***	***	***	***
Poudre Valley Hospital	Fort Collins	62	0	0	4.2	
Rose Medical Center	Denver	8	***	***	***	***
Swedish Medical Center	Englewood	17	***	***	***	***
University Of Colorado Hospital	Aurora	101	0	0	4.2	

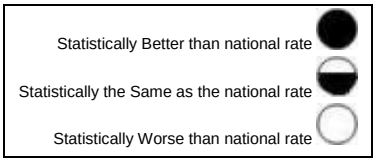
*In January 2008, NHSN changed the criteria for laboratory confirmed bloodstream infections. National rates provided by NHSN are based on the criteria used before January 2008. Adjustments will be made to the data in order to compensate for criteria changes when new national rates become available.

Comparison to the national rate calculated from NHSN participating hospitals in 2006.

See *National Healthcare Safety Network (NHSN) Report, data summary for 2006, issued June 2007* for reference

**Facility central line infection rate for NICU level and weight category.

-----Infection data for hospitals with less than 50 central line days in a 12 month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements



Conclusion

This report shows the initial results from a new reporting system. The department and the Colorado Health Facility Acquired Infection Advisory Committee recommend users of these data not draw definitive conclusions from the limited information that is currently available. Facilities vary in the types of patients they treat, and a facility that treats a high volume of severely ill patients may have higher infection rates. Tests of statistical significance are used to determine if the number of infections in a facility is unusually high or low in comparison to the national average. A statistically significant test indicates that results do not happen by chance alone. It is possible for two hospitals to have zero infections yet Hospital A is statistically the same as the national rate and Hospital B is statistically better than the national rate. This can occur because Hospital B, for example, has more central-line days so its rate would be compared to a higher expected number of central line-associated blood stream infections (CLABSI).

It is important to note, initiatives involving new reporting systems require time to allow facilities to become familiar with the requirements and ensure the system is used correctly. The department believes that the disclosure initiative will ultimately help Colorado health facilities identify areas for improvement and result in fewer infections in the coming years. Because only one year of data is available, the department is not able to provide trending information. Trend reports will gauge the progress hospitals are making in preventing infections over time. Trend reports will be developed once enough data is collected.

Health Facility Acquired Infections Report

Appendices

Appendix *A*

Colorado Health Facility Acquired Infection Advisory Committee

A representative from a public hospital

Angela Camiolo, R.N., M.Ed., C.I.C., Infection Prevention Program Manager, Memorial Health System – Colorado Springs

A representative from a private hospital

Paul J. Poduska, B.S., M(ASCP), C.I.C., Infection Control Coordinator, Poudre Valley Health System – Fort Collins

A Board Certified or Board Eligible physician licensed in the State of Colorado, who is affiliated with a Colorado hospital or medical school, who is an active member of a national organization specializing in health care epidemiology or infection control, and who has demonstrated an interest and expertise in health facility infection control

Connie S. Price, M.D., Denver Health Medical Center, Chief, Division of Infectious Diseases and Medical Director of Infection Control and Prevention, Department of Medicine, Board Certified in Medical Microbiology, Infectious Diseases, and Internal Medicine - Denver

Four infection control practitioners, one from a stand alone ambulatory surgical center and three Registered Nurses who are certified by the Certification Board of Infection Control and Epidemiology

1. Susan K. Mazula, R.N., B.S.N., C.I.C., C.O.H.N., Infection Prevention Coordinator, Sky Ridge Medical Center – Lone Tree

2. Deborah Teetzel, R.N., M..S.N., Administrator, Rocky Mountain Surgery Center - Englewood

3. Amber Miller, R.N., M.S.N., C.I.C., Manager Infection Prevention and Control, Lutheran Medical Center – Arvada

4. Heather M. Gilmartin, R.N., M.S.N., N.P., C.I.C., Nurse Epidemiologist, Vail Valley Medical Center - Vail

A medical statistician with an advanced degree in such specialty or one clinical microbiologist with an advanced degree in such specialty

Allison Lee Sabel-Soteres, M.D., Ph.D., Denver Health Medical Center, Director of Medical Biostatistics – Denver

A representative from a health consumer organization

Denise de Percin, B.A., Executive Director, Colorado Consumer Health Initiative – Denver

A representative from a health insurer

Peggy SaBell, R.N., M.S., C.I.C., Regional Infection Control Director, Kaiser Foundation Health Plan of Colorado - Denver

A representative from a purchaser of health insurance

Committee Chair Kerry O'Connell, Construction Executive, Mortenson Construction - Denver

Appendix *B*

Health Facilities Reporting

Based on the mandatory reporting bill there are approximately 240 health facilities targeted to report health facility acquired infections. Many of the health facilities targeted to report will not report on the initial set of metrics because:

- Dialysis procedures are not included in the initial reporting requirements;
- Ambulatory surgery centers are not able to enroll in and submit data to NHSN; and
- Some health facilities do not perform the procedures selected for the initial reporting requirements.

Initial metrics will only be reported by the following 57 hospitals. Health facilities reporting the initial metrics are listed alphabetically below with the procedures they currently perform. The numbers before the facility names correspond to the map on the page following.

1 Animas Surgical Hospital
Durango, CO 81301
575 Rivergate Lane
970.247.3537
www.animassurgical.com
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Herniorrhaphy

2 Arkansas Valley Regional Medical Center
La Junta, CO 81050
1100 Carson Avenue
719.383.6000
www.avrmc.org
Performing & Reporting:
Central Lines
Herniorrhaphy

3 Aspen Valley Hospital
0401 Castle Creek Road
Aspen, CO 81611
970.544.1261
www.avhaspen.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Central Lines
Herniorrhaphy

4 Boulder Community Hospital
1100 Balsam Avenue
Boulder, CO 80301
303.440.2273
www.bch.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Coronary Artery Bypass Grafts
Central Lines
Herniorrhaphy

5 Boulder Community Hospital- Foothills Campus
4747 Arapahoe Avenue
Boulder, CO 80303
303.440.2273
www.bch.org
Performing & Reporting:
Central Lines
Herniorrhaphy

6 Centura Health-Avista Adventist Hospital
100 Health Park Dr
Louisville, CO 80027
303.673.1000
www.avistahospital.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Central Lines in 2 ICU types
Herniorrhaphy

7 Centura Health-Littleton Adventist Hospital
7700 S Broadway
Littleton, CO 80122
303.730.8900
www.mylittletonhospital.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

8 Centura Health-Penrose St. Francis Health Services
2222 N Nevada Ave
Colorado Springs, CO 80907
719.776.5000
www.penrosestfrancis.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Graft
- Central Lines
- Herniorrhaphy

9 Centura Health-Porter Adventist Hospital
2525 S Downing St
Denver, CO 80210
303.778.1955
www.porterhospital.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

10 Centura Health-St Anthony Central Hospital
4231 W 16th Ave
Denver, CO 80204
303.629.3511
www.stanthonyhosp.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

11 Centura Health-St Anthony North Hospital
2551 W 84th Avenue
Westminster, CO 80031
303.426.2402
www.stanthonyhosp.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

12 Centura Health-St Mary Corwin Medical Center
1008 Minnequa Ave
Pueblo, CO 81004
719.560.4000
www.stmarycorwin.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

13 Centura Health-St Thomas More Hospital
1338 Phay Ave
Canon City, CO 81212
719.285.2287
www.stmhospital.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines

14 The Children's Hospital Association
13123 East 16th Avenue
Denver, CO 80218
www.thechildrenshospital.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

15 Colorado Mental Health Institute at Pueblo
1600 W 24th St
Pueblo, CO 81003
www.cdhs.state.co.us/cmhip
Performing & Reporting:
- Total/Partial Hip Replacement
- Herniorrhaphy

16 Colorado Plains Medical Center
1000 Lincoln St
Fort Morgan, CO 80701
www.coloradoplainsmedicalcenter.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

17 Community Hospital
2021 N 12th St
Grand Junction, CO 81501
www.gjhosp.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

18 Delta County Memorial Hospital
1501 E 3rd Street
Delta, CO 81416
www.deltahospital.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

19 Denver Health Medical Center
777 Bannock St
Denver, CO 80204
www.denverhealth.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

20 East Morgan County Hospital District
2400 W Edison St
Brush, CO 80723
www.bannerhealth.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Herniorrhaphy

21 Exempla Good Samaritan Medical Center
200 Exempla Circle
Lafayette, CO 80026
www.exempla.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

22 Exempla Lutheran Medical Center
8300 W 38th Ave
Wheat Ridge, CO 80033
www.exempla.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

23 Exempla Saint Joseph Hospital
1835 Franklin St
Denver, CO 80218
www.exempla.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

24 Grand River Medical Center
501 Airport Road
Rifle, CO 81650
www.grhd.org
Performing & Reporting:
- Partial Hip Replacement
- Partial Knee Replacement
- Herniorrhaphy

25 Gunnison Valley Hospital
711 N Taylor Street
Gunnison, CO 81230
www.gvh-colorado.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines

26 Heart of the Rockies Regional Medical Center
448 E First St
Salida, CO 81201
www.hrrmc.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

27 Kremmling Memorial Hospital District
214 S 4th Street
Kremmling, CO 80459
www.kremmlinghospital.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

28 Longmont United Hospital
1950 Mountain View Avenue
Longmont, CO 80502
www.luhcares.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

29 McKee Medical Center
2000 Boise Ave
Loveland, CO 80539
www.bannerhealth.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

30 The Medical Center of Aurora
1501 S Potomac St
Aurora, CO 80012
www.auroramed.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

31 Medical Center of the Rockies
2500 Rocky Mountain Avenue
Loveland, CO 80538
www.pvhs.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

32 Memorial Hospital Central
1400 E Boulder St
Colorado Springs, CO 80909
www.memorialhealthsystem.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

33 Memorial Hospital North
4050 Briargate Parkway
Colorado Springs, CO 80920
www.memorialhealthsystem.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

34 The Memorial Hospital
785 Russell St
Craig, CO 81625
www.thememorialhospital.com
Performing & Reporting:
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

35 Mercy Regional Medical Center
1010 Three Springs Blvd
Durango, CO 81301
www.mercydurango.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

36 Montrose Memorial Hospital
800 S 3rd St
Montrose, CO 81401
www.montrosehospital.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

37 North Colorado Medical Center
1801 16th Street
Greeley, CO 80631
www.bannerhealth.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

38 North Suburban Medical Center
9191 Grant St
Thornton, CO 80229
www.northsuburban.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

39 Parker Adventist Hospital
9395 Crown Crest Blvd
Parker, CO 80138
www.parkerhospital.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

40 Parkview Medical Center Inc
400 W 16th Street
Pueblo, CO 81003
www.parkviewmc.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

41 Pikes Peak Regional Hospital
16420 Highway 24
Woodland Park, CO 80863
www.pikespeakregionalhospital.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Herniorrhaphy

42 Platte Valley Medical Center
1600 Prairie Center Parkway
Brighton, CO 80601
www.pvmc.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

43 Poudre Valley Hospital
1024 S Lemay Ave
Fort Collins, CO 80524
www.pvhs.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

44 Presbyterian St Luke's Medical Center
1719 E 19th Ave
Denver, CO 80218
www.pslmc.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

45 Rose Medical Center
4567 E 9th Avenue
Denver, CO 80220
www.rosemed.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

46 San Luis Valley Regional Medical Center
106 Blanca Ave
Alamosa, CO 81101
www.slvrmc.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

47 Sky Ridge Medical Center
10101 Ridge Gate Parkway
Lone Tree, CO 80124
www.skyridgemedcenter.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

48 Southwest Memorial Hospital
1311 N Mildred Rd
Cortez, CO 81321
www.swhealth.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

49 St. Anthony Summit Medical Center
340 Peak One Drive
Frisco, CO 80443
www.stanthonyhosp.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

50 St Mary's Hospital and Medical Center
2635 N 7th Street
Grand Junction, CO 81502
www.stmarygj.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

51 Sterling Regional Medical Center
615 Fairhurst St
Sterling, CO 80751
www.bannerhealth.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

52 Swedish Medical Center
501 E Hampden Avenue
Englewood, CO 80113
www.swedishhospital.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

53 University of Colorado Hospital
12605 East 16th Avenue
Aurora, CO 80045
www.uch.edu
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Coronary Artery Bypass Grafts
- Central Lines
- Herniorrhaphy

54 Vail Valley Medical Center
181 W Meadow Drive
Vail, CO 81657
www.vvmc.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

55 Valley View Hospital Association
1906 Blake Ave
Glenwood Springs, CO 81601
www.vvh.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy

56 Wray Community District Hospital
1017 W 7th St
Wray, CO 80758
www.wcdh.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Herniorrhaphy

57 Yampa Valley Medical Center
1024 Central Park Dr
Steamboat Springs, CO 80487
www.yvmc.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Central Line
Herniorrhaphy

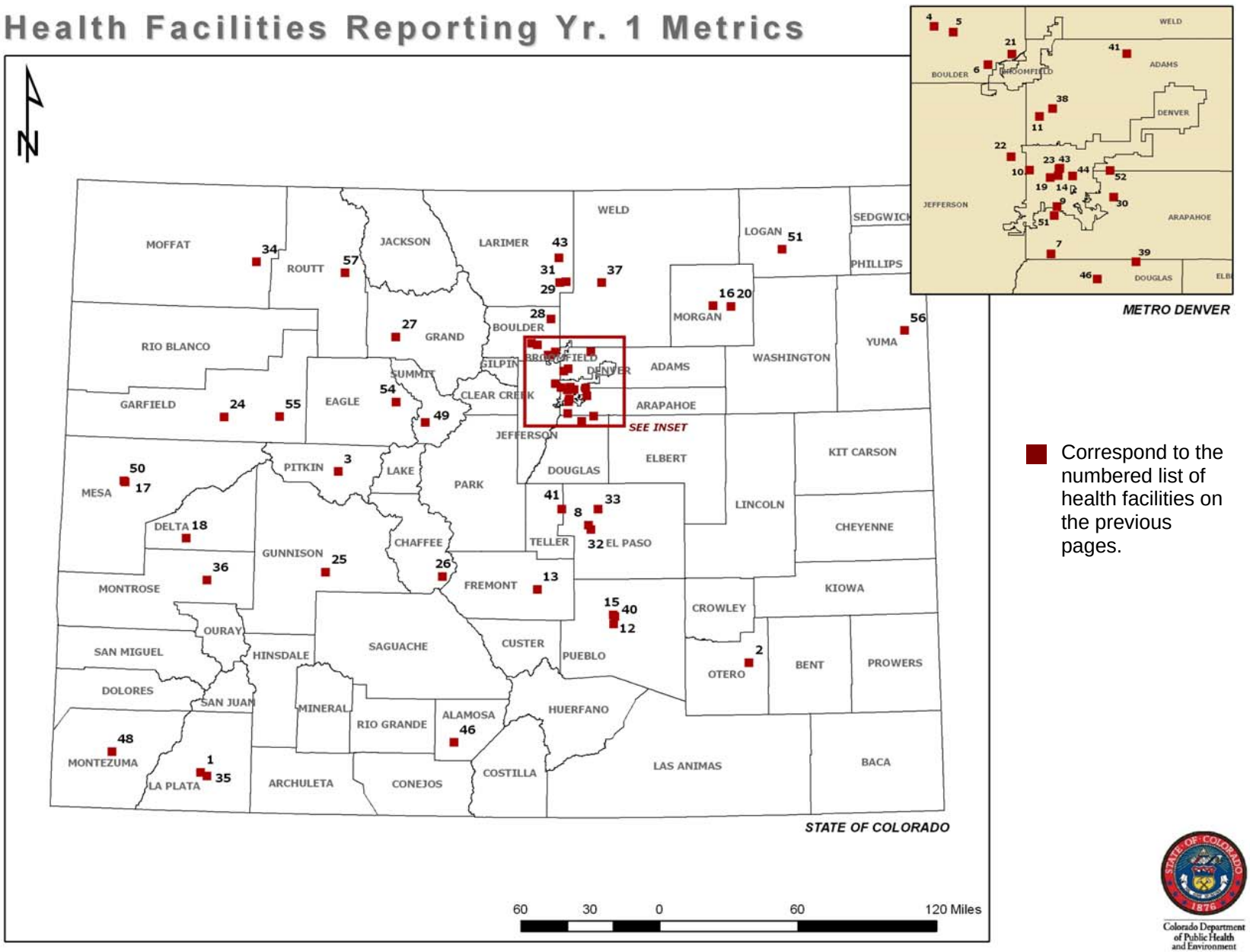


Figure 1: Health Facilities Reporting Year One Metrics

Appendix *C*

Important Terms and Abbreviations

Ambulatory surgery center (ASC) are typically freestanding health facility that can keep patients for up to 23 hours to perform surgical procedures.

CDC is the Centers for Disease Control and Prevention.

CDPHE is Colorado Department of Public Health and Environment.

Case an instance of a particular disease, injury, or other health conditions that meets selected criteria.

CAUTI catheter-associated urinary tract infection. A urinary tract infection that occurs in a patient who had an indwelling urethral urinary catheter in place within the 7-day period before the onset of the urinary tract infection.

Central line a flexible tube that is inserted near the patient's heart or into one of the large veins or arteries. A central line provides access to a large vein that can be used to give fluids, measure the amount of fluid in the body or to give medication.

Central line associated bloodstream infections (CLABSI) are infections in a patient who has a central line that was used within the 48-hour period before the onset of the infection.

Definition a set of uniformly applied criteria for determining whether a person should be identified as having a particular disease, injury, or other health condition. In epidemiology, particularly for an outbreak investigation, a case definition specifies clinical criteria and details of time, place, and person.

Device-associated infection an infection in a patient with a device (e.g., ventilator or central line) that was used within the 48-hour period before onset of infection.

Drug-resistant infections have become resistant to antibiotics commonly used to kill infections caused by resistant strains of bacteria. Usually, other antibiotics can be used to kill drug-resistant infections.

Epidemiology the study of the distribution and determinants of health conditions or events among populations and the application of that study to control health problems.

Exposure having come into contact with a cause of, or possessing a characteristic that is a determinant of, a particular health problem.

HHS the federal Department of Health and Human Services.

Health a state of complete physical, mental, and social well-being and not merely the absence of disease or other infirmity.

Healthcare-associated infection (HAI) is an infection that occurs in a healthcare setting while seeking care for a separate condition. In this report the term HAI is not used and has been replace with Health Facility Acquired Infections.

Health facility acquired infection occurs in a patient while in a healthcare setting for treatment of a separate condition.

Heart bypass or coronary artery bypass graft (CABG, pronounced cabbage) 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.

Hip replacement is 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. The surgical procedure for a hip replacement involves removing the damaged cartilage and bone from the hip joint and replacing them with new, man-made parts.

Infant child less than one year old.

Infection invasion of the body tissues of a host by an infectious agent, whether or not it causes disease.

Intensive care unit (ICU) a nursing care area that provides intensive observation, diagnosis, and therapeutic procedures for adults and/or children who are critically ill.

Knee replacement surgery (arthroplasty) is an elective procedure for people with severe knee damage and pain related to osteoarthritis, rheumatoid arthritis, and traumatic arthritis. A total knee replacement involves removing the damaged cartilage and bone from the surface of the knee joint and replacing them with a man-made surface of metal and plastic. A partial knee replacement involves replacing only part of the knee joint.

Location the specific patient care area to which a patient is assigned while receiving care in the healthcare facility.

MRSA methicillin-resistant Staphylococcus aureus. Methicillin is an antibiotic drug commonly used to treat Staphylococcus (staph) infections. Some strains of staph are not killed by methicillin. If the staph infection is not killed by methicillin then it is called methicillin-resistant Staphylococcus aureus, or MRSA.

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

Mortality death.

NHSN or the National Healthcare Safety Network is a CDC developed web based health facility acquired infections reporting system.

Neonate a patient who is an infant less than or up to 30 days of age (NHSN definitions).

Neonatal intensive care unit (NICU) a patient care area that provides care to the most critically ill infants.

Nosocomial of or related to hospitals a secondary disorder associated with being treated in a hospital but unrelated to the patient's primary condition.

Operating Room (OR) a patient care area that meets the American Institute of Architects (AIA) criteria for an operating room. This may include an operating room, C-Section room, interventional radiology room or a cardiac catheterization lab.

Operation a single trip to the operating room (OR) where a surgeon makes at least one incision through the skin or mucous membrane, including laparoscopic approach, and closes the incision before the patient leaves the OR.

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 or events or attributes among a given population.

Rate an expression of the relative frequency with which an event occurs among a defined population per unit of time, calculated as the number of new cases or deaths during a specified period divided by either person-time or the average (midinterval) population. In epidemiology, it is often used more casually to refer to proportions that are not truly rates (e.g., attack rate or case-fatality rate).

Risk the probability that an 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 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.

Surveillance, active public health surveillance in which the health agency solicits reports.

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

Symptom any indication of disease noticed or felt by a patient.

The department is the Colorado Department of Public Health and Environment.

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

Umbilical catheter is a long, soft plastic tube that is placed in the umbilical cord either through the umbilical artery or umbilical vein to allow fluids and medications to be given over an extended period of time.

Validity the degree to which a measurement, questionnaire, test, or study or any other data-collection tool measures what it is intended to measure.

VAP ventilator-associated Pneumonia. Pneumonia that occurs in a patient who was intubated and ventilated at the time of or within 48 hours before the onset of pneumonia.

Appendix *D*

Standardized Infection Ratio

The Standardized Infection Ratio (SIR) is a risk adjusted summary measure that accounts for the type of procedure and risk category. The following example demonstrates how the SIR is calculated and how to determine if a hospital's ratio is significantly different from the national average.

Hospital A performed 190 hip prosthesis procedures last year and 5 surgical site infections (SSIs) occurred. Table 1 shows for each risk category the number of SSIs, number of hip prosthesis procedures, SSI rate for the risk category, national SSI rate based on the National Nosocomial Infection Surveillance system (NNIS), and the expected number of SSIs.

Table 1. Hip prosthesis procedures and SSI rates by risk category

Risk category	# of SSIs	# of hip prosthesis procedures	Hospital SSI Rate (SSIs per 100 procedures)	NNIS Rate (SSIs per 100 procedures)	Expected # of SSIs
0	1	100	1.0	0.86	0.86
1	2	60	3.3	1.65	0.99
2,3	2	30	6.7	2.52	0.76
TOTAL	5	190	--	--	2.61

An example for calculating the SSI rate for risk category 1, expected number of SSIs for risk category 1, and total expected SSIs is shown below:

$$\text{SSI Rate for risk category } 1 = \frac{2\ \text{SSIs}}{60\ \text{procedures}} * 100 = 3.3$$

$$\text{Expected SSIs for risk category } 1 = \#\ \text{of procedures} * \text{NNIS rate} = 60 * 1.65/100 = 0.99$$

$$\text{Expected SSIs overall} = \sum \text{expected SSIs} = 0.86 + 0.99 + 0.76 = 2.61$$

The SIR is the ratio of the observed to expected SSIs collapsed over all risk categories, i.e. after adjusting for the risk of the procedure.

$$\text{SIR} = \frac{\text{observed SSIs}}{\text{expected SSIs}} = \frac{5}{2.61} = 1.92$$

Interpretation of the SIR is done by comparing a hospital's value to 1.0 (observed and expected number of SSIs 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 1.0, there are fewer infections than expected. In this example, Hospital A has 92% more SSIs than expected.

The statistical significance of Hospital A's increase in SSIs compared to the national average is tested using a Z-test or Poisson test. A p-value is produced from the test and helps to determine if the difference in the SSI rate is due to chance alone. If the p-value is greater than or equal to 0.05, then there is no significant difference between the hospital's SSI rate and the national rate. If the p-value is less than 0.05, then the difference is statistically significant. At this point, the value of the SIR determines whether the hospital is better than or worse than the national average. If the SIR is greater than 1, then the hospital has significantly more SSIs than were expected based on the national average. The converse also applies where if the SIR is less than 1, the hospital has significantly fewer SSIs than were expected.

$$Z\ score = \left|1.96 * \left(\sqrt{\#\text{ of observed SSI}} - \sqrt{\#\text{ of expected SSI}}\right)\right|$$
$$= \left|1.96 * \left(\sqrt{5} - \sqrt{2.61}\right)\right| = 1.22$$

This score translates into a p-value of 0.22. Therefore, even though Hospital A had 95% more infections than expected, it is not significantly different from the national rate.