State of Colorado

Status Report on the Health Facility-Acquired Infections Disclosure Initiative

January 13, 2012

Submitted to the Colorado General Assembly

By the Health Facilities and Emergency Medical Services Division

Colorado Department of Public Health and Environment

Colorado Department of Public Health and Environment

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Executive Summary

This report presents data from hospitals, hospital units, long-term acute care hospitals, ambulatory surgery centers and dialysis treatment centers concerning health facility-acquired infections. Health facility-acquired infections are infections not present when a patient is admitted to a healthcare facility and include surgical site infections, central line-associated bloodstream infections, and dialysis-related infections.

Colorado health facilities report infection data through the National Healthcare Safety Network (NHSN)[1], a national web-based surveillance and reporting system, managed by the Centers for Disease Control and Prevention (CDC). Each facility's infection data are compared to national data for specific surgical procedures or devices (i.e., central lines or dialysis access types) and through statistical analysis, are determined to be better, worse, or the same as national infection data.

Users of this report should note that the data presented are self-reported by each facility and without external validation, these data should be interpreted with caution. Additionally, the NHSN is a complicated system with challenging definitions that could also result in inaccurate reporting of data. Therefore, it is recommended that conclusions regarding healthcare quality not be based on these data alone, but instead made in conjunction with other quality indicators. Consumers should always consult with doctors, healthcare facilities, health insurance carriers, healthcare websites from reputable sources (e.g., Hospital Compare, Colorado Hospital Report Card, Leap Frog), and with their families and friends before deciding where to receive care. In doing so, multiple factors should be considered including a facility's history, reputation, staff experience, and published healthcare quality indicators. In 2010, the Patient Safety Program began data validation efforts and additional outreach activities to facilities with the intent to improve the consistency and accuracy of reported infection data. It is hoped that facilities use data in this report to target and improve infection prevention efforts and that consumers use these data to their healthcare-related decisions.

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Introduction

This report was written to fulfill the 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 May 2006. Representative Bob McClusky and Senator Maryanne Keller sponsored this bill. This bill requires hospitals, long-term acute care hospitals, hospital units, ambulatory surgery centers, and dialysis treatment centers to report health facility-acquired infections (HAI) 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 Disclosure Act and is responsible for program implementation, oversight and reporting. The legislation required the Department's executive director to appoint an eleven–member, voluntary, HAI advisory committee to assist with these responsibilities.

The Disclosure Act also requires the Department to produce an annual report disclosing HAI data submitted by Colorado health facilities. This report is the fifth annual report published by the Department and is due to the Health and Human Services Committees of the Colorado Senate and House of Representatives by January 13, 2012.

This report presents information about Colorado's Disclosure Act, including details regarding reporting requirements, processes and limitations; information about the Patient Safety Program; and infection data on surgical site infections, central line-associated bloodstream infections, and dialysis-related infections.

Surgical site infection data are reported by hospitals and ambulatory surgery centers for the following surgeries: coronary artery bypass grafts, hip prostheses (total and partial), knee prostheses (total and partial), hernia repairs (herniorrhaphies), and abdominal and vaginal hysterectomies.

Central line-associated bloodstream infections (CLABSI) are reported for specific adult Critical Care Units, neonatal Critical Care Units, and Long-Term Acute Care Hospitals. Adult units include adult medical/surgical critical care, medical cardiac critical care, surgical cardiothoracic critical care, medical critical care, and surgical critical care. Neonatal critical care units report central line and umbilical catheter infections for level II/III and level III units.

Dialysis treatment centers report dialysis-related infections including local access infections and vascular bloodstream infections from the following access types: fistulas, grafts, temporary and permanent central lines.

Health Facility-Acquired Infections Disclosure Law Overview

Health facility-acquired infections (HAI) are infections not present when a patient is admitted to a healthcare facility. The occurrence of HAI is a growing concern among healthcare consumers, purchasers and providers. As consumer demand for public reporting of healthcare quality information has increased, policymakers nationwide have acknowledged the need for publishing HAI data in consumer focused healthcare quality reports. The demand has driven 32 states and the District of Columbia to pass laws pertaining to HAI reporting since 2003.[2] Colorado's Hospital-Acquired Infections Disclosure Act (House Bill 06-1045) was passed in May 2006.

This Law requires hospitals, including long-term acute care hospitals (LTACH), hospital units, ambulatory surgery centers (ASC), and dialysis treatment centers (DTC) to report HAI data as a condition of their state licensure. The law also calls for physicians to ensure that infections diagnosed during follow-up visits are reported back to the facilities where procedures were performed.

Experts in the field of infection control, including the Centers for Disease Control and Prevention (CDC), recommend that health facilities not report overall facility infection rates as this could divert resources from infection prevention in higher risk locations. [3,4,5,6]

Thus, the Law requires facilities to report infections acquired in specific facility locations, during specific surgical procedures, and from the use of specific devices (such as central lines and dialysis catheters). This report presents infection information grouped by procedure and/or device so that health facilities can more readily identify areas in need of process improvements and more specifically target infection prevention efforts.

Another requirement of Colorado's Disclosure Law is that reporting facilities enter HAI data into the National Healthcare Safety Network (NHSN).[1] NHSN is a national, electronic, web-based reporting system, managed by the CDC. The use of NHSN potentially improves the validity of reported HAI data because facilities must use standard definitions and reporting rules. Doing so improves reporting consistency and allows facility HAI data to be compared to national rates, and be more easily understood by the public and healthcare facilities.

Although many health facilities had collected and tracked HAI data for decades, the information had not been released to the public until the implementation of state disclosure laws. In light of the recent passage of the Centers for Medicare and Medicaid Services (CMS) Rule for public disclosure of HAI, it is expected that HAI reporting will increase over the next several years.

Health Facility-Acquired Infections Disclosure Law Implementation

Implementing Colorado's HAI Disclosure Law involved four main activites, as described below:

1. Appointing and coordinating an HAI advisory committee
2. Selecting clinical metrics
3. Overseeing reported data entered into National Healthcare Surveillance Network
4. Reporting results

1: Appointing and Coordinating an HAI Advisory Committee

Colorado's Disclosure Law required the Department's executive director to appoint an eleven-member HAI advisory committee, the Colorado Health Facility-Acquired Infection Advisory Committee. Many of the Law's elements were determined by this committee, including the requirement that the committee assist the Department with its implementation and oversight, the selection of clinical metrics, assurance of data quality, and development and distribution of reports.

This advisory committee has provided invaluable expertise and will continue to play a pivotal role in evaluating the quality and accuracy of reported data, and in determining and evaluating future projects of the Patient Safety Program.

The Law requires the following committee composition: one representative each from a public and private hospital, a representative of a health insurer, a consumer/purchaser of health insurance, a representative of a health consumer organization, four infection control practitioners (one from a stand-alone ambulatory surgery center and three Registered Nurses who are board certified in infection control and epidemiology); a board certified or board eligible physician licensed in Colorado who is affiliated with a Colorado hospital or medical school and is an active member of a national organization specializing in health care epidemiology or infection control, and; a Master or Ph.D. level medical statistician or clinical microbiologist. Current committee members who fulfill these roles, respectively, are presented in Table 1 with their committee roles, position titles, facilities and cities, and date committee their committee terms began.

Table 1: Colorado Health Facilities-Acquired Infections Advisory Committee

Name	Committee Role	Position Title	Facility	Serving Since
Linda J. "B" Burton, RN, BSN, CIC	Representative from a public hospital	Infection Preventionist	University of Colorado Hospital, Aurora	December 2009
Paul J. Poduska , BS, M (ASCP), CIC	Representative from a private hospital	Infection Control Coordinator	Poudre Valley Health System, Fort Collins	January 2008
Peggy SaBell, RN, MS, CIC	Representative of a health insurer	Regional Infection Control Director	Kaiser Foundation Health Plan of Colorado, Denver	January 2008
Kerry O'Connell	Consumer	Construction Executive	Stapleton Infrastructure, Denver	August 2007
Denise de Percin, BA	Representative of health consumer organization	Executive Director	Colorado Consumer Health Initiative, Denver	March 2007
Deborah Teetzel, RN, MS	Infection control practitioner from a stand- alone ambulatory surgery center	Administrator	Rocky Mountain Surgery Center, Englewood	May 2008
Heather M. Gilmartin, RN, MSN, NP, CIC	Certified infection control practitioner	Nurse Epidemiologist	Vail Valley Medical Center, Vail	October 2008
Cindy Thistle, RN, CIC	Certified infection control practitioner	Infection Preventionist	Littleton Hospital, Littleton	January 2011
Beth Reasoner, RN, BSN, MS, CIC	Certified infection control practitioner	Infection Preventionist	Boulder Community Hospital, Boulder	January 2011
Connie S. Price, MD	Board certified physician	Chief, Division of Infectious Diseases and Medical Director of Infection Control and Prevention	Denver Health Medical Center, Denver	March 2007
Allison Lee Sabel-Soteres, MD, PhD	Medical statistician	Director of Medical Biostatistics	Denver Health Medical Center, Denver	March 2007

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

- Ensure all components of House Bill 06-1045 are completed
- Provide guidance for the reporting metrics of healthcare-acquired infections
- Evaluate relevancy and accuracy of reporting requirements
- Establish priorities for completion of validation studies
- Provide input on outreach activities and research projects such as prevention collaboratives, rural outreach programs, surveillance studies, and other HAI-related projects as needed
- Provide guidance regarding the Annual Report due January 15 of each year and other reports developed for consumers and healthcare personnel
- Promote safe healthcare for Colorado citizens with regard to healthcare-acquired infections

2: Selecting Clinical Metrics

The second activity in implementing Colorado's Disclosure Law is the selection of metrics that health facilities report. The Department and the Advisory Committee were limited in their selection of metrics by the following factors:

- The legislation required health facilities to report HAI data for specific clinical procedures, including specified cardiac (heart), orthopedic (skeletal), and abdominal surgeries and insertions of central line (tube in vein) devices, and;
- The metrics had to be supported by the NHSN reporting system.

The metrics selected include infections related to surgeries, central lines, and outpatient dialysis. The surgeries were selected based on their high volume and risk for infection. Moreover, since these types of surgeries are performed at numerous and varied health facilities in Colorado, consumers have more opportunity to choose where they receive surgical treatment. Central line-associated bloodstream infections (CLABSI) are bloodstream infections associated with the presence of central lines in adults, or with a central line or umbilical catheter (tube in a newborn's umbilical cord) in neonates (infant $\leq$ 30 days old). A central line is an intravascular catheter (tube in a vein) that terminates at or close to the heart or in one of the great vessels (i.e., aorta, superior vena cava). Central lines, which may be temporary or permanent, are used to infuse fluids, withdraw blood, or monitor fluid volume in patients. Dialysis-related infections (DRI) include bloodstream infections and localized infections of the vascular access site. Dialysis is a method for

removing waste products and fluid from a patient's blood when the kidneys are in failure. Because of frequent hospitalizations and receipt of antimicrobial drugs, dialysis patients are at high risk for infection.

In implementing the selected metrics, the Department applied a recommendation by the federal Healthcare Infection Control Practices Advisory Committee (HICPAC) to introduce new reporting requirements gradually and incrementally. HICPAC, which is considered to be the nation's expert in infection control, serves as the advisory committee to the CDC and the Secretary of the Department of Health and Human Services (HHS). Their recommendation was based on experiences indicating that rapid implementation of reporting systems often contributes to data misinterpretation and poor data quality. Table 2 below depicts the yearly implementation of Colorado's selected reporting metrics.

In selecting metrics, the following factors were considered:[7]

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

Table 2: Implementation of Reporting Requirements

2007	2008	2009	2010	2011	2012
Central lines in **select** critical care units (adult and neonatal) August 2007	All 2007 metrics	All 2007 and 2008 metrics	All 2007 – 2009 metrics	All 2007 – 2010 metrics	All 2007 – 2011 metrics **excluding hernias in hospitals**
Hip replacements August 2007	Central lines in long-term acute care hospitals August 2008	Abdominal hysterectomies August 2009	Dialysis centers March 2010	Central lines in **all** adult critical care units August 2011	Colon procedures (**Hospitals only)** January 2012
Knee replacements August 2007	Hernia repairs October 2008	Vaginal hysterectomies August 2009		Breast procedures August 2011	Central lines in inpatient rehabilitation units January 2012
Coronary artery bypass grafts August 2007	Ambulatory Surgery Centers October 2008			Central lines in rehabilitation hospitals August 2011	

3: Overseeing reported data entered into National Healthcare Surveillance Network

Colorado's HAI Disclosure Law requires that participating health facilities report HAI data using the National Healthcare Safety Network (NHSN) to fulfill public reporting obligations. The NHSN is a secure, web-based surveillance system developed, administered and maintained by the CDC. The NHSN integrates patient and healthcare personnel safety surveillance data from facilities nationwide.

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

Colorado's HAI Disclosure Law also specifies requirements for healthcare facility staff responsible for collecting and reporting HAI data. By law, these individuals must be certified in infection control and epidemiology[8] or become certified within six months of becoming eligible of taking the certification test. These certification requirements do not apply to staff in hospitals with 50 beds or less, dialysis centers or ambulatory surgery centers. However, staff in these facilities must complete specified NHSN educational programs before enrolling in NHSN, complete 10 hours of relevant infection prevention education annually, and maintain a log of the completed education.

4: Reporting Results

The final activity of implementation is the development of annual public reports and semi-annual bulletins. The current report is the fifth annual report published by the Department. It is noted that the HAI data presented in this report have not been subjected to formal data quality checks or data validation studies. Without systematic data quality monitoring, the extent of incomplete and incorrectly entered data cannot be ascertained. The Department recently completed a formal validation study of CLABSI data for the first quarter of 2010 and recently began a validation study of hernia procedures and associated infections performed between January and June 2010. See Appendix A for the validation protocols and results.

Participating Facilities

There are currently 259 hospitals, hospital units, ambulatory surgical centers and dialysis treatment clinics targeted for infection reporting. Of those, 69 hospitals (90%), 9 long-term acute care hospitals (100%), 38 ambulatory surgical centers (37.6%), and 61 dialysis treatment clinics (100%) report infection data. Certain hospitals and ambulatory surgical centers do not report to the Department because they do not have adult critical care units, neonatal critical care units or do not perform reportable procedures. Tables 3 – 5 describe the number of health facilities in Colorado that report infection data for the specific critical care units and long-term acute care hospitals (Table 3), perform the reportable procedures (Table 4), and the number of outpatient dialysis facilities in Colorado (Table 5). For a full list of reporting healthcare facilities in Colorado, refer to Appendix B.

Table 3: Number of Colorado hospitals reporting central line associated bloodstream infections by critical care unit.

Critical Care Unit	Number of facilities
Medical	6
Surgical	2
Medical/Surgical	45
Medical Cardiac	3
Cardiothoracic surgery	2
Level II/III Neonatal Critical Care	12
Level III Neonatal Critical Care	5
Long-term Acute Care Hospitals	9

Table 4: Number of Colorado hospitals and ambulatory surgical centers performing the reportable procedures

Procedure	Hospitals	Ambulatory Surgical Center	Total
Abdominal hysterectomy	58	4	62
Coronary artery bypass graft	18	0	18
Hernia repair	69	37	106
Hip replacement	56	5	61
Knee replacement	56	7	63
Vaginal hysterectomy	52	5	57

Table 5: Number of Colorado dialysis treatment centers.

Dialysis centers	Number of facilities: 61

Patient Safety Program in 2011

Since November 2009, the Patient Safety Program at the Colorado Department of Public Health and Environment has been operating primarily under American Recovery and Reinvestment Act (ARRA) grant funding. This two year grant has allowed the program to add more full time staff, provide more support to Colorado infection preventionists, implement two prevention collaboratives, and carry out data validation efforts. The program has five full time employees: program coordinator, public health nurse consultant, epidemiologist, quality improvement specialist, and a CDC fellow, as well as a part time statistician. The ARRA funds have been used to implement two validation projects allowing program staff to visit facilities to assess surveillance and collection techniques in Colorado hospitals and ambulatory surgery centers. See Appendix A for the full description of the Validation Studies and preliminary results. The HAI prevention collaboratives focus on the reducing (1) surgical site infections (SSI) and (2) *Clostridium difficile* infections. See Appendix C for a full description of the prevention collaboratives.

Program Staff:

Sara Reese, PhD – Program Coordinator

Tamara Hoxworth, PhD – Quality Improvement Specialist

Tara Janosz, MPH – Epidemiologist

Karen Rich, RN, BSN, MEd, CIC – Public Health Nurse Consultant

Juan Suazo, MPH – CDC Fellow

Kirk Bol, MSPH - Statistician

Health Facility-Acquired Infections Report

Infection Data

Cautions

The Department and the Colorado Health Facility Acquired Infection Advisory Committee recommends that users of these data not draw definitive conclusions from the limited information currently available. Additional information to consider before receiving healthcare at a specific facility can be found in Appendix D.

There are several reasons direct comparisons between facilities do not provide an accurate assessment. 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, regardless of their prevention efforts. The NHSN system provides the best risk adjustment possible to account for this, though there will always be patient risk factors that cannot be measured, and included in the adjustment. This is more likely to occur with severely ill patients, whose risk of infection is greater. The risk adjustment and comparison used in this report was developed using statistical methods. It should be noted these methods are only estimates based on historic information.

The surveillance manuals provided by the NHSN are well developed, however often are difficult to apply to real patients with complicated medical histories. Additionally, each facility uses different surveillance techniques to find infections. Some infection preventionists have more resources for surveillance, thus may find and report more infections than other facilities. Higher infection rates may be due to better surveillance practices rather than poor infection control practices.

Data in this report pertains to patients receiving medical care between August 2010 and July 2011. Facilities are required to report HAI data within thirty days of each month's end. CDPHE works with facilities quarterly to ensure data is reported timely. The surveillance definition for a surgical site infection states an infection is reportable if it occurs within one year of certain types of procedures. Since a full year of reporting has not occurred for some procedures, underreporting of some infections may result. Based on past reporting years, the number of infections not yet reported is expected to be very low.

The NHSN is not the perfect system but the CDC and the Patient Safety Program in the Department are working constantly to provide valid and useful data to the public.

Colorado Aggregate Healthcare-Acquired Infection Data

Colorado aggregate central line-associated bloodstream infection data

The table below shows aggregate central line associated bloodstream infection (CLABSI) rates for adult critical care units (CCU), neonatal critical care units (NCCU), and long-term acute care hospitals (LTACH) in Colorado by reporting year (August 1 – July 31), along with the number of central line days. The CCU and NCCU data is divided by location type. For all three locations, there is a downward trend in the CLABSI rate from 2008 to 2010. The CCU CLABSI rate has shown a 43% decrease; NCCU CLABSI rate has decreased 38% and the LTACH CLABSI rate has decreased by 45% over the last three years. These data suggest that public reporting of infections may enhance individual facilities' accountability and focus on reducing infections.

Table 6: Colorado aggregate CLABSI data

	Aug 2007 - July 2008	Aug 2008 - July 2009	Aug 2009 - July 2010	Aug 2010 - July 2011
Cardiac Critical Care Unit	0.87	1.31	0.95	0.74
Cardiothoracic Critical Care Unit	0.31	0.62	0.25	1.09
Medical Critical Care Unit	1.44	1.71	1.66	1.28
Medical/Surgical Critical Care Unit	1.19	1.48	1.28	0.76
Surgical Critical Care Unit	3.78	3.55	3.76	1.99
All reporting Adult Critical Care Unit	1.26	1.57	1.37	**0.89**
Long-term Acute Care Hospital	NA	1.66	1.31	0.92
Neonatal Critical Care Level II/III	1.99	1.45	1.03	0.51
Neonatal Critical Care Level III	3.08	2.35	2.42	1.76
All reporting Neonatal Critical Care Units	2.70	1.96	1.83	1.21
CO CLABSI rate	1.52	**1.64**	**1.42**	**0.94**

Colorado aggregate surgical site infection data

The tables below show aggregate surgical site infection rates for Colorado reportable procedures by reporting year (August 1 – July 31). The infection rates are divided into three different categories: superficial incisional, deep incisional, and organ space (see page 33 for definitions), along with the total infection rate for each procedure and Colorado's total infection rate. For all of the procedures, the infection rate has fluctuated over the last four years. The number of procedures has increased over the years along with the number of infections. The most common infection type for all procedures is the deep incisional infection. The overall surgical site infection rate is 0.97 infections/100 procedures.

Table 7: Colorado aggregate SSI rates (# of infections/100 procedures)

7a. Coronary artery bypass surgery

	2007	2008	2009	2010
Superficial incisional	0.33	0.80	0.73	1.13
Deep Incisional	0.83	0.86	0.73	1.13
Organ space	0.22	0.51	0.73	0.50
Total	1.49	2.22	2.13	2.44

7b. Hernia repair surgery

	2007	2008	2009	2010
Superficial incisional	NA	0.20	0.27	0.23
Deep Incisional	NA	0.28	0.33	0.31
Organ space	NA	0.07	0.13	0.08
Total	NA	0.61	0.74	0.54

7c. Hip replacement surgery

	2007	2008	2009	2010
Superficial incisional	0.22	0.30	0.26	0.31
Deep Incisional	0.60	0.63	0.61	0.53
Organ space	0.21	0.35	0.37	0.31
Total	1.11	1.29	1.17	1.08

7d. Hysterectomy – Abdominal

	2007	2008	2009	2010
Superficial incisional	NA	NA	0.31	0.39
Deep Incisional	NA	NA	0.52	0.48
Organ space	NA	NA	0.52	0.50
Total	NA	NA	1.39	1.31

7e. Hysterectomy – Vaginal

	2007	2008	2009	2010
Superficial incisional	NA	NA	0.15	0.21
Deep Incisional	NA	NA	0.22	0.17
Organ space	NA	NA	0.52	0.68
Total	NA	NA	0.96	0.98

7f. Knee replacement surgery

	2007	2008	2009	2010
Superficial incisional	0.24	0.19	0.21	0.14
Deep Incisional	0.43	0.40	0.35	0.46
Organ space	0.32	0.35	0.29	0.29
Total	1.09	0.89	0.85	0.85

Colorado facility specific standardized infection ratio

The table below shows a facility specific standardized infection ratio (SIR) and national comparison by reporting year (August 1 – July 31). SIR is a ratio of the observed number of infections divided by the expected number of infections (See Appendix E for a complete description of the SIR). The expected number of infections is calculated based on national infection data and facility specific patient population and risk factors. The sum of the observed infections and expected infections across CCU, NCCU and procedures provides the observed and expected number of infections for a facility-wide SIR. The reportable procedures and critical care units for each facility can be found in Appendix B. Each facility has an expected number of infections calculated based on national rates and the risk of their patient population. For each year and each facility, the number of infections, SIR and national comparison are presented with the total number of infections and SIR for Colorado.

Table 8: Colorado facility specific standardized infection ratio

	2007*			2008*			2009**			2010***		
Health Facility	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**
Animas Surgical Hospital	0	0.0	Same	0	0.0	Same	0	0.0	Same	0	0.0	Same
Arkansas Valley Regional Medical Center	0	0.0	Same	0	0.0	Same	2	2.2	Same	0	0.0	Same
Aspen Valley Hospital	0	0.0	Same	0	0.0	Same	1	1.0	Same	0	0.0	Same
Boulder Community Hospital	7	0.6	Same	11	0.8	Same	10	0.8	Same	7	0.6	Same
Boulder Community Hospital Foothills	0	0.0	Same	0	0.0	Same	1	0.5	Same	3	1.2	Same
Centura Avista Adventist Hospital	11	2.7	Worse	6	1.3	Same	3	0.5	Same	10	1.8	Same
Centura Littleton Adventist Hospital	6	0.6	Same	1	0.1	Better	9	0.8	Same	11	1.0	Same
Centura Penrose St. Francis Health	14	0.7	Same	24	1.3	Same	44	1.8	Worse	33	1.4	Same
Centura Porter Adventist Hospital	22	0.9	Same	35	1.4	Same	37	1.5	Worse	29	1.2	Same
Centura St. Anthony Hospital	10	0.5	Same	13	0.5	Better	12	0.5	Better	12	0.6	Better

	2007*			2008*			2009**			2010***		
Health Facility	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**
Centura St. Anthony North Hospital	6	0.6	Same	4	0.3	Better	11	1.4	Same	8	0.9	Same
Centura St. Francis Medical Center	NA	NA	NA	8	1.2	Same	12	1.0	Same	15	1.2	Same
Centura St. Mary Corwin Medical Center	12	2.0	Worse	8	0.8	Same	18	1.7	Same	10	1.1	Same
Centura St. Thomas More Hospital	0	0.0	Same	0	0.0	Same	0	0.0	Same	6	1.8	Same
Children's Hospital Colorado	21	1.5	Same	17	1.2	Same	20	1.7	Worse	12	1.2	Same
Colorado Plains Medical Center	2	2.5	Same	0	0.0	Same	1	0.6	Same	0	0.0	Same
Community Hospital	4	1.4	Same	8	1.7	Same	8	1.4	Same	9	1.5	Same
Delta County Memorial Hospital	3	1.9	Same	3	1.1	Better	0	0.0	Same	2	0.6	Same
Denver Health Medical Center	10	0.9	Same	10	0.8	Same	20	1.3	Same	10	0.7	Same
East Morgan County Hospital	0	0.0	Same	0	0.0	Same	0	0.0	Same	0	0.0	Same
Estes Park Medical Center	NA	NA	NA	0	0.0	Same	0	0.0	Same	0	0.0	Same
Exempla Good Samaritan Medical Center	5	0.6	Same	6	0.5	Same	12	0.7	Same	8	0.5	Better
Exempla Lutheran Medical Center	11	0.6	Better	14	0.5	Better	27	1.0	Same	21	0.9	Same
Exempla St Joseph Hospital	16	0.4	Better	10	0.2	Better	24	0.6	Better	19	0.5	Better
Grand River Medical Center	0	0.0	Same	0	0.0	Same	0	0.0	Same	0	0.0	Same
Gunnison Valley Hospital	0	0.0	Same	0	0.0	Same	0	0.0	Same	4	8.8	Worse
Heart of the Rockies Regional Medical Center	0	0.0	Same	1	0.9	Same	1	0.8	Same	4	3.0	Same
Kit Carson County Memorial Hospital	NA	NA	NA	0	0.0	Same	0	0.0	Same	0	0.0	Same

	2007*			2008*			2009**			2010***		
Health Facility	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**	**Number of infections**	**SIR**	**National Comparison**
Kremmling Memorial Hospital	NA	NA	NA	0	0.0	Same	0	0.0	Same	0	0.0	Same
Lincoln Community Hospital	NA	NA	NA	0	0.0	Same	0	0.0	Same	0	0.0	Same
Longmont United Hospital	8	0.8	Same	5	0.5	Same	4	0.3	Better	7	0.6	Same
McKee Medical Center	7	1.8	Same	1	0.2	Same	4	0.5	Same	7	0.7	Same
Medical Center of the Rockies	3	0.3	Better	7	0.5	Better	12	0.7	Same	7	0.4	Better
Melissa Memorial Hospital	NA	NA	NA	NA	NA	NA	0	0.0	Same	0	0.0	Same
Memorial Hospital Central	33	0.8	Same	48	1.1	Same	41	1.0	Same	41	1.0	Same
Memorial Hospital North	4	1.4	Same	3	0.7	Same	10	0.9	Same	12	1.2	Same
Mercy Regional Medical Center	0	0.0	Same	1	0.2	Same	5	0.8	Same	3	0.6	Same
Montrose Memorial Hospital	2	0.9	Same	4	1.2	Same	7	1.2	Same	7	1.3	Same
Mt. San Rafael Hospital	NA	NA	NA	0	0.0	Same	0	0.0	Same	0	0.0	Same
North Colorado Medical Center	13	0.8	Same	11	0.7	Same	11	0.6	Same	10	0.5	Same
North Suburban Medical Center	4	1.0	Same	4	0.8	Same	10	1.3	Same	5	0.6	Same
OrthoColorado Hospital at St. Anthony Medical Campus	NA	NA	NA	NA	NA	NA	0	0.0	Same	0	0.0	Same
Parker Adventist Hospital	1	0.9	Same	4	0.9	Same	5	0.6	Same	6	0.7	Same
Parkview Medical Center	7	0.7	Same	17	1.3	Same	17	1.0	Same	11	0.7	Same
Pikes Peak Regional Hospital	0	0.0	Same	0	0.0	Same	0	0.0	Same	0	0.0	Same
Platte Valley Medical Center	3	1.7	Same	8	3.3	Worse	9	2.8	Worse	2	0.5	Same
Poudre Valley Hospital	13	0.9	Same	14	0.7	Same	18	0.6	Same	13	0.5	Better
Presbyterian St. Luke's Medical Center	20	0.9	Same	15	0.7	Same	17	0.7	Same	12	0.5	Better
Prowers Medical Center	NA	NA	NA	0	0.0	Same	0	1.0	Same	1	0.0	Same
Rose Medical Center	9	0.6	Same	10	0.7	Same	13	0.5	Better	11	0.4	Better
San Luis Valley Regional Medical Center	1	0.8	Same	2	0.8	Same	0	0.0	Same	1	0.5	Same

Health Facility	2007*			2008*			2009**			2010***		
	Number of infections	SIR	National Comparison	Number of infections	SIR	National Comparison	Number of infections	SIR	National Comparison	Number of infections	SIR	National Comparison
Sky Ridge Medical Center	13	1.5	Same	10	0.9	Same	31	1.4	Same	34	1.4	Same
Southeast Colorado Hospital	NA	NA	NA	0	0.0	Same	0	0.0	Same	0	0.0	Same
Southwest Memorial Hospital	1	1.0	Same	1	0.6	Same	1	0.7	Same	0	0.0	Same
Spanish Peaks Regional Health Center	NA	NA	NA	1	1.0	Same	0	0.0	Same	0	0.0	Same
St. Anthony Summit Medical Center	0	0.0	Same	2	2.9	Same	0	0.0	Same	1	0.8	Same
St. Mary's Hospital	5	0.3	Better	11	0.7	Same	10	0.5	Better	12	0.5	Better
St. Vincent General Hospital District	NA	NA	NA	0	0.0	Same	0	0.0	Same	0	0.0	Same
Sterling Regional Medical Center	6	6.4	Worse	4	1.9	Same	2	0.8	Same	0	0.0	Same
Swedish Medical Center	25	1.2	Same	45	1.8	Worse	32	1.0	Same	23	0.7	Same
The Medical Center of Aurora	18	1.0	Same	31	1.6	Worse	38	1.8	Worse	30	1.6	Worse
The Memorial Hospital	1	4.8	Same	0	0.0	Same	0	0.0	Same	0	0.0	Same
University of Colorado Hospital	43	1.3	Same	60	1.6	Worse	57	1.4	Worse	38	1.1	Same
Vail Valley Medical Center	1	0.6	Same	0	0.0	Same	4	1.1	Same	1	0.3	Same
Valley View Hospital	0	0.0	Same	2	0.7	Same	6	1.4	Same	5	1.2	Same
Wray Community Hospital	0	0.0	Same	1	5.9	Same	0	0.0	Same	1	2.6	Same
Yampa Valley Medical Center	3	2.2	Same	0	0.0	Same	1	0.5	Same	1	0.5	Same
Yuma District Hospital	NA	NA	NA	0	0.0	Same	0	0.0	Same	0	0.0	Same
Colorado	**404**	**0.9**	**Better**	**501**	**0.9**	**Better**	**638**	**1.0**	**Same**	**540**	**0.8**	**Better**

National comparison based on data collected and reported by NHSN-participating hospitals.

NA: Data not available

* "National Healthcare Safety Network (NHSN) Report, Data Summary for 2006 – 2008, Issued December 2009" Am J Infect Control 2009; 37: 783 – 805.

**"National Healthcare Safety Network (NHSN) Report, Data Summary for 2009, Device-Associated Module", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention.

*** "National Healthcare Safety Network (NHSN) Report, Data Summary for 2010", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention.

See "Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network" (Inf Control and Hosp Epi, October 2011, Vol 32, No 10, pp. 970-986).

Surgical Site Infection Overview

Surgical site infections (SSI) are infections directly related to an operative procedure. Surgical procedures selected for SSI reporting are (1) performed at a high volume, (2) performed at a variety of facilities, or (3) associated with a high risk for health facility-acquired infections. The surgeries monitored for SSI in Colorado include cardiac procedures, hip and knee replacements, hernia repairs, and hysterectomies (abdominal and vaginal). Evidence has shown that reporting of infections may lead to better adherence to preventive practices and decreased medical complications.

The National Healthcare Safety Network (NHSN) manual defines reportable procedures for surveillance as those that occur in a single trip to an operating room, where the incision is closed following the procedure. Surgeries are performed as either in- or outpatient procedures. An inpatient procedure as defined by NHSN is a procedure whose dates of admission and discharge are different calendar days. An outpatient procedure is defined as a procedure whose dates of admission and discharge are the same calendar day.

Surgical site infections are classified into three different categories, based on the location of the infection.[9] Reportable infections occur within 30 days of the procedure or within one year if a permanent implant is used during the procedure. [9] There are specific criteria for each infection category, based on specific signs of infection and the location of the infection. Common signs of infection are fever, pain, or tenderness, drainage, redness, or abscess.[9]

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

It is estimated more than 20% of HAI are attributed to infections stemming from surgical sites, equating to infections in approximately 2% of all surgical procedures nationally.[10] The impacts from an SSI can be devastating, often leading to a longer hospital stay, increased treatments, and higher costs.[11] The lives lost, increased medical treatments, and time spent in rehabilitation following an SSI are not the only negative outcome that occurs. The economic toll that is associated with SSI is also a staggering statistic with far reaching implications. In 2005, United States acute care hospital discharge data projected that an additional 928,663 hospital treatment days, and an additional $1.6 billion in hospital costs were attributed to SSI. Furthermore, when these numbers are examined at the

individual level, the difference between a patient with and without an SSI is determined to average an increased length of stay in the hospital of 9.7 days and an increased cost of $20,842.[11]

Standardized Infection Ratio

Facilities' surgical site infection results are compared using standardized infection ratio (SIR). The SIR is a risk adjusted summary measure that accounts for the type of procedure and patient risk. It is the ratio of the observed to expected number of SSI (observed infections / expected infections = SIR). The expected number of infections is calculated based on national infection data and patient risk at each health facility. The SIR is used to compare facilities instead of using a crude rate, which is the number of SSI per total number of procedures performed. Overall crude rates for SSI are not risk adjusted and should not be used to compare facilities due to inherent differences in the patient risk in each facility.

The risk adjustment is accomplished by estimating an expected number of infections for a facility, for a particular procedure type. The NHSN develops an expected number of infections by analyzing nationwide facility historical data. For SSI, the expected risk of infection is calculated for each patient who undergoes the procedure, which is then summed for the expected number of infections for the facility. In this report, hospitals and ambulatory surgical centers use different patient parameters to determine the expected number of infections (for orthopedic procedures only). This is because the NHSN has released an updated risk adjustment method that does not apply to orthopedic procedures performed in ASC. The specific risk factors are chosen based on their ability to predict an SSI. The parameters for the patient risk adjustment are included in the specific procedure overviews in this report.

Interpretation of the SIR is as follows: A hospital's SIR value is compared to 1.0 (observed and expected number of SSI 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 (Poisson test) is used to determine if the difference is statistically significant. It is important to note that it is possible for a facility's SIR to be higher or lower than 1.0, but due to statistical comparison and the total number of procedures and infections, not be significantly better or worse than the national rate. Also, it is possible for an SIR to be statistically high or low, even when a different facility has an even higher or lower (respectively) SIR that is not statistically significant. Again, this is due to the numbers of procedures, infections, and the statistical testing process. For an example of how this calculation works please refer to Appendix E.

Cardiac procedures

Background

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

Results

Table 9 shows facility specific data for SSI attributed to CBGB surgeries performed in hospitals from August 1, 2009 through July 31, 2010 and August 1, 2010 through July 31, 2011.

Each table lists all the hospitals in Colorado that performed the procedure, the city where the hospital is located, the number of procedures performed, the number of infections, the standardized infection ratio (SIR) based on the national infection data, and the comparison to the national infection data. For the definition of SIR please refer to page 34 or see Appendix E. The three categories summarizing how a Colorado hospital compares to the national infection data performed are:

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

The specific patient risk factors used to calculate the expected number of infections are:

- Age
- Gender
- American Society of Anesthesiologists Score (ASA score, describes the health of the patient)
- Facility bed size

Table 9: Coronary Artery Bypass Grafts with Chest and Donor Site Incisions, Inpatient Procedures for Hospitals, 2009-10 and 2010-11

Surgical Site Infections (SSI) in Coronary Artery Bypass Grafts with Chest and Donor Site Incisions in Hospitals (Inpatient) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Boulder Community Hospital	**Boulder**	74	1	0.6	Same	51	0	0.0	Same
Centura Penrose St. Francis Health Services	**Colorado Springs**	110	1	0.5	Same	186	5	1.4	Same
Centura Porter Adventist Hospital	**Denver**	85	2	1.3	Same	94	5	2.4	Same
Centura St. Anthony Hospital	**Lakewood**	105	1	0.4	Same	66	0	0.0*	Same
Exempla Lutheran Medical Center	**Wheat Ridge**	87	0	0.0	Same	64	1	0.7	Same
Exempla St. Joseph Hospital	**Denver**	159	1	0.3	Same	135	1	0.4	Same
Longmont United Hospital	**Longmont**	32	0	0.0*	Same	31	1	1.1	Same
Medical Center of Aurora	**Aurora**	80	2	1.0	Same	85	1	0.5	Same
Medical Center of the Rockies	**Loveland**	159	1	0.2	Same	151	1	0.2	Same

Surgical Site Infections (SSI) in Coronary Artery Bypass Grafts with Chest and Donor Site Incisions in Hospitals (Inpatient) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Memorial Hospital Central	**Colorado Springs**	247	1	0.2	Same	262	5	1.1	Same
North Colorado Medical Center	**Greeley**	76	1	0.6	Same	76	1	0.6	Same
Parkview Medical Center	**Pueblo**	105	1	0.5	Same	54	1	0.9	Same
Presbyterian St. Luke's Medical Center	**Denver**	24	3	7.0	Worse	23	0	0.0	Same
Rose Medical Center	**Denver**	14	***	***	***	14	***	***	***
Sky Ridge Medical Center	**Lone Tree**	31	1	1.3	Same	36	2	2.4	Same
St. Mary's Hospital	**Grand Junction**	122	0	0.0	Same	135	1	0.4	Same
Swedish Medical Center	**Englewood**	73	3	2.5	Same	75	1	0.8	Same
University of Colorado Hospital	**Aurora**	58	2	1.5*	Same	60	1	0.8	Same

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.

National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.

See "Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network" (Inf Control and Hosp Epi, October 2011, Vol 32, No 10, pp. 970-986).

* Indicates that the expected number of infections used in SIR is not accurately calculated due to an NHSN limitation.

*** Indicates value not shown due to suppression of infections data.

Infections data for hospitals with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Orthopedic Procedures

Background

The orthopedic procedures reported are hip replacements (total or partial) and knee replacements (total or partial). These procedures can be performed either as in- or outpatient procedures.

A total or partial hip replacement is a surgery for people with severe hip damage or pain related to chronic osteoarthritis, rheumatoid arthritis or other degenerative processes involving the hip joint. The surgical procedure for a hip replacement involves removing the damaged cartilage and bone from the hip joint and replacing them 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 head of the thighbone and finally a metal stem that attaches to the bone.

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

Results

Tables 10 through 13 show facility specific data for SSI attributed to the two different procedures performed in hospitals (inpatient and outpatient) and ambulatory surgical centers (outpatient only). The tables present data from surgeries performed from August 1, 2009 through July 31, 2010 and August 1, 2010 through July 31, 2011.

Each table lists all the healthcare facilities in Colorado that performed the procedure, the city where the facility is located, the number of procedures performed, the number of infections, the standardized infection ratio (SIR) based on the national infection data, and the comparison to the national infection data. For the definition of SIR refer to page 34 or see Appendix E.

The three categories summarizing how a Colorado hospital compares to the national infection data for procedure performed are:

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

The specific patient risk factors used to calculate the expected number of infections for **hospitals** are:

- Age
- Receiving anesthesia
- American Society of Anesthesiologists Score (ASA score, describes the health of the patient)
- Length of the procedure
- Type of knee (revision or primary) or hip (total primary, partial primary, or total revision/partial) replacement surgery
- Facility bed size
- Procedure was related to trauma
- Gender (for knee replacement only)

The specific patient risk factors used to calculate the expected number of infections for **ASC** are:

- Length of the procedure
- Wound type
- American Society of Anesthesiologists Score (ASA score, describes the health of the patient)

Table 10: Hip Replacement (total or partial), Inpatient and Outpatient Procedures for Hospitals, 2009 – 2010 and 2010 – 2011

Surgical Site Infections (SSI) in Hip Replacement Procedures (total or partial) in Hospitals (In- and Outpatient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Animas Surgical Hospital	Durango	19	***	***	***	47	0	0.0	Same
Arkansas Valley Regional Medical Center	La Junta	3	***	***	***	12	***	***	***
Aspen Valley Hospital	Aspen	4	***	***	***	3	***	***	***
Boulder Community Hospital	Boulder	317	4	1.0	Same	351	2	0.5	Same
Centura Avista Adventist Hospital	Louisville	100	0	0.0	Same	126	3	2.4	Same
Centura Littleton Adventist Hospital	Littleton	75	0	0.0	Same	141	3	1.5	Same
Centura Penrose St. Francis Health Services	Colorado Springs	420	8	1.6	Same	414	8	1.5	Same
Centura Porter Adventist Hospital	Denver	533	7	1.2	Same	514	11	1.8	Same
Centura St. Anthony Hospital	Lakewood	296	0	0.0	Same	203	1	0.4	Same
Centura St. Anthony North Hospital	Westminster	69	0	0.0	Same	61	0	0.0	Same
Centura St. Francis Medical Center	Colorado Springs	174	1	0.5	Same	125	1	0.7	Same
Centura St. Mary Corwin Medical Center	Pueblo	126	7	4.0	Worse	103	2	1.4	Same
Centura St. Thomas More Hospital	Canon City	39	0	0.0	Same	62	4	5.1	Worse
Children's Hospital Colorado	Aurora	13	***	***	***	9	***	***	***
Colorado Plains Medical Center	Fort Morgan	29	0	0.0	Same	12	***	***	***
Community Hospital	Grand Junction	67	0	0.0	Same	78	3	2.4	Same

Surgical Site Infections (SSI) in Hip Replacement Procedures (total or partial) in Hospitals (In- and Outpatient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Delta County Memorial Hospital	Delta	50	0	0.0	Same	57	0	0.0	Same
Denver Health Medical Center	Denver	86	2	1.8	Same	99	1	0.8	Same
East Morgan County Hospital	Brush	7	***	***	***	18	***	***	***
Exempla Good Samaritan Medical Center	Lafayette	301	1	0.3	Same	240	0	0.0*	Same
Exempla Lutheran Medical Center	Wheat Ridge	332	2	0.6	Same	224	5	2.0	Same
Exempla St. Joseph Hospital	Denver	460	1	0.2	Better	498	4	0.7*	Same
Grand River Medical Center	Rifle	9	***	***	***	7	***	***	***
Gunnison Valley Hospital	Gunnison	9	***	***	***	3	***	***	***
Heart of the Rockies Regional Medical Center	Salida	13	***	***	***	12	***	***	***
Longmont United Hospital	Longmont	107	1	0.5	Same	105	1	0.6	Same
McKee Medical Center	Loveland	122	0	0.0	Same	134	0	0.0	Same
Medical Center of Aurora	Aurora	181	6	2.6	Same	174	3	1.4	Same
Medical Center of the Rockies	Loveland	72	4	4.1	Worse	84	1	0.9	Same
Memorial Hospital Central	Colorado Springs	387	3	0.5	Same	384	3	0.6	Same
Memorial Hospital North	Colorado Springs	90	3	2.7	Same	97	1	0.8	Same
Mercy Regional Medical Center	Durango	89	0	0.0	Same	83	2	2.0	Same
Montrose Memorial Hospital	Montrose	56	0	0.0	Same	54	1	1.3	Same

Surgical Site Infections (SSI) in Hip Replacement Procedures (total or partial) in Hospitals (In- and Outpatient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
North Colorado Medical Center	Greeley	144	2	0.8	Same	150	1	0.4	Same
North Suburban Medical Center	Thornton	49	0	0.0	Same	62	0	0.0	Same
OrthoColorado Hospital at St. Anthony Medical Campus	Lakewood	15	***	***	***	286	2	0.8	Same
Parker Adventist Hospital	Parker	45	1	1.5	Same	62	1	1.1	Same
Parkview Medical Center	Pueblo	162	2	0.8	Same	202	1	0.3*	Same
Pikes Peak Regional Hospital	Woodland Park	9	***	***	***	4	***	***	***
Platte Valley Medical Center	Brighton	11	***	***	***	11	***	***	***
Poudre Valley Hospital	Fort Collins	499	6	1.0	Same	498	2	0.3	Same
Presbyterian St. Luke's Medical Center	Denver	249	4	1.2*	Same	249	1	0.3	Same
Rose Medical Center	Denver	405	1	0.2*	Same	332	0	0.0	Same
San Luis Valley Regional Medical Center	Alamosa	28	0	0.0	Same	21	0	0.0	Same
Sky Ridge Medical Center	Lone Tree	438	11	2.2	Worse	442	7	1.3*	Same
Southwest Memorial Hospital	Cortez	31	0	0.0	Same	36	0	0.0	Same
St. Anthony Summit Medical Center	Frisco	13	***	***	***	2	***	***	***
St. Mary's Hospital	Grand Junction	223	0	0.0	Same	259	3	1.0	Same
Sterling Regional Medical Center	Sterling	27	2	4.7	Same	40	0	0.0	Same
Swedish Medical Center	Englewood	212	3	1.1	Same	224	2	0.7	Same
The Memorial Hospital	Craig	4	***	***	***	1	***	***	***

Surgical Site Infections (SSI) in Hip Replacement Procedures (total or partial) in Hospitals (In- and Outpatient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
University of Colorado Hospital	**Aurora**	226	7	2.2	Same	206	6	2.3	Same
Vail Valley Medical Center	**Vail**	42	0	0.0	Same	37	0	0.0	Same
Valley View Hospital	**Glenwood Springs**	75	1	1.3	Same	73	0	0.0	Same
Wray Community Hospital	**Wray**	4	***	***	***	6	***	***	***
Yampa Valley Medical Center	**Steamboat Springs**	42	0	0.0	Same	47	0	0.0	Same

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.

National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.

See "Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network" (Inf Control and Hosp Epi, October 2011, Vol 32, No 10, pp. 970-986).

* Indicates that the expected number of infections used in SIR is not accurately calculated due to an NHSN limitation.

*** Indicates value not shown due to suppression of infections data.

Infections data for hospitals with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Table 11: Hip Replacement (total or partial), Outpatient Procedures for Ambulatory Surgery Centers, 2009 – 2010 and 2010 – 2011

Surgical Site Infections (SSI) in Hip Replacement Procedures (total or partial) in Ambulatory Surgery Centers (Outpatient) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Loveland Surgery Center	Loveland	1	***	***	***	0	***	***	***
Orthopaedic Center of the Rockies	Fort Collins	128	0	0.0	Same	142	0	0.0	Same
Rocky Mountain Surgery Center	Englewood	0	***	***	***	1	***	***	***
Skyline Surgery Center	Loveland	0	***	***	***	2	***	***	***
Surgical Center at Premier	Colorado Springs	0	***	***	***	2	***	***	***

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.

National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.

See "National Healthcare Safety Network (NHSN) Report, Data Summary for 2006-2008, Issued December 2009" (Am J Infect Control 2009;37:783-805).

*** Indicates value not shown due to suppression of infections data.

Infections data for ASCs with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These ASCs have met the reporting requirements.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Initiatives Program, Colorado Department of Public Health and Environment.

Table 12: Knee Replacement (total or partial), Inpatient and Outpatient Procedures for Hospitals, 2009 – 2010 and 2010 – 2011

Surgical Site Infections (SSI) in Knee Replacement Procedures (total or partial) in Hospitals (In- and Outpatient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Animas Surgical Hospital	Durango	76	0	0.0	Same	81	0	0.0	Same
Arkansas Valley Regional Medical Center	La Junta	12	***	***	***	44	0	0.0	Same
Aspen Valley Hospital	Aspen	22	1	5.4	Same	28	0	0.0	Same
Boulder Community Hospital	Boulder	241	1	0.5	Same	256	2	0.8	Same
Centura Avista Adventist Hospital	Louisville	180	2	1.3	Same	156	1	0.8	Same
Centura Littleton Adventist Hospital	Littleton	131	0	0.0	Same	146	0	0.0	Same
Centura Penrose St. Francis Health Services	Colorado Springs	442	7	1.5	Same	447	2	0.4	Same
Centura Porter Adventist Hospital	Denver	1,009	12	1.5	Same	979	7	0.9	Same
Centura St. Anthony Hospital	Lakewood	515	1	0.2	Same	285	0	0.0	Same
Centura St. Anthony North Hospital	Westminster	73	3	3.8	Same	80	2	2.8	Same
Centura St. Francis Medical Center	Colorado Springs	311	5	1.8	Same	294	2	0.7	Same
Centura St. Mary Corwin Medical Center	Pueblo	210	2	0.9	Same	214	3	1.5	Same
Centura St. Thomas More Hospital	Canon City	93	0	0.0	Same	79	1	1.6	Same
Children's Hospital Colorado	Aurora	2	***	***	***	2	***	***	***
Colorado Plains Medical Center	Fort Morgan	38	1	2.8	Same	31	0	0.0	Same
Community Hospital	Grand Junction	124	1	0.8	Same	124	2	1.6	Same

Surgical Site Infections (SSI) in
Knee Replacement Procedures (total or partial) in Hospitals (In- and Outpatient Combined)
Reporting Period: August 1, 2009-July 31, 2011

Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Delta County Memorial Hospital	**Delta**	129	0	0.0	Same	101	2	2.4	Same
Denver Health Medical Center	**Denver**	98	4	3.8	Worse	126	4	3.1	Same
East Morgan County Hospital	**Brush**	16	***	***	***	15	***	***	***
Exempla Good Samaritan Medical Center	**Lafayette**	512	1	0.2	Same	444	1	0.3	Same
Exempla Lutheran Medical Center	**Wheat Ridge**	547	5	1.1	Same	323	3	1.0	Same
Exempla St. Joseph Hospital	**Denver**	648	4	0.7*	Same	635	5	0.9	Same
Grand River Medical Center	**Rifle**	7	***	***	***	9	***	***	***
Gunnison Valley Hospital	**Gunnison**	8	***	***	***	4	***	***	***
Heart of the Rockies Regional Medical Center	**Salida**	15	***	***	***	40	2	5.6	Same
Longmont United Hospital	**Longmont**	207	0	0.0	Same	218	0	0.0	Same
McKee Medical Center	**Loveland**	230	0	0.0	Same	290	1	0.4	Same
Medical Center of Aurora	**Aurora**	374	6	1.6	Same	341	7	1.9	Same
Medical Center of the Rockies	**Loveland**	63	2	2.9	Same	87	0	0.0	Same
Memorial Hospital Central	**Colorado Springs**	543	5	0.8	Same	638	1	0.2	Better
Memorial Hospital North	**Colorado Springs**	244	0	0.0	Same	328	4	1.4	Same
Mercy Regional Medical Center	**Durango**	130	1	0.9	Same	114	0	0.0	Same
Montrose Memorial Hospital	**Montrose**	168	1	0.7	Same	141	1	0.9	Same

Surgical Site Infections (SSI) in
Knee Replacement Procedures (total or partial) in Hospitals (In- and Outpatient Combined)
Reporting Period: August 1, 2009-July 31, 2011

Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
North Colorado Medical Center	**Greeley**	225	2	0.8	Same	286	3	0.9	Same
North Suburban Medical Center	**Thornton**	109	1	1.0	Same	174	2	1.3	Same
OrthoColorado Hospital at St. Anthony Medical Campus	**Lakewood**	29	0	0.0	Same	604	3	0.7	Same
Parker Adventist Hospital	**Parker**	75	0	0.0	Same	163	3	2.1	Same
Parkview Medical Center	**Pueblo**	325	9	2.7	Worse	361	6	1.5	Same
Pikes Peak Regional Hospital	**Woodland Park**	12	***	***	***	32	0	0.0	Same
Platte Valley Medical Center	**Brighton**	97	3	3.5	Same	48	0	0.0	Same
Poudre Valley Hospital	**Fort Collins**	1,014	5	0.6	Same	995	4	0.4	Same
Presbyterian St. Luke's Medical Center	**Denver**	360	3	0.8*	Same	373	4	1.0*	Same
Rose Medical Center	**Denver**	587	0	0.0	Better	532	3	0.7	Same
San Luis Valley Regional Medical Center	**Alamosa**	50	0	0.0	Same	42	1	2.7	Same
Sky Ridge Medical Center	**Lone Tree**	603	9	1.6	Same	806	15	1.9	Worse
Southwest Memorial Hospital	**Cortez**	44	1	2.5	Same	48	0	0.0	Same
St. Anthony Summit Medical Center	**Frisco**	25	0	0.0	Same	40	1	3.5	Same
St. Mary's Hospital	**Grand Junction**	332	1	0.3	Same	301	1	0.3	Same
Sterling Regional Medical Center	**Sterling**	34	0	0.0	Same	29	0	0.0	Same
Swedish Medical Center	**Englewood**	273	1	0.4	Same	305	2	0.7	Same

Surgical Site Infections (SSI) in
Knee Replacement Procedures (total or partial) in Hospitals (In- and Outpatient Combined)
Reporting Period: August 1, 2009-July 31, 2011

Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
The Memorial Hospital	**Craig**	6	***	***	***	0	***	***	***
University of Colorado Hospital	**Aurora**	316	4	1.1	Same	299	4	1.3	Same
Vail Valley Medical Center	**Vail**	200	2	1.2	Same	204	1	0.6	Same
Valley View Hospital	**Glenwood Springs**	133	0	0.0	Same	123	1	1.0	Same
Wray Community Hospital	**Wray**	12	***	***	***	16	***	***	***
Yampa Valley Medical Center	**Steamboat Springs**	80	0	0.0	Same	90	0	0.0	Same

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.

National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.

See "Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network" (Inf Control and Hosp Epi, October 2011, Vol 32, No 10, pp. 970-986).

* Indicates that the expected number of infections used in SIR is not accurately calculated due to an NHSN limitation.

*** Indicates value not shown due to suppression of infections data.

Infections data for hospitals with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Table 13: Knee Replacement (total or partial), Outpatient Procedures for Ambulatory Surgery Centers, 2009 – 2010 and 2010 – 2011

Surgical Site Infections (SSI) in Knee Replacement Procedures (total or partial) in Ambulatory Surgery Centers (Outpatient) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
ASC Durango at Mercy Medical Center	Durango	0	***	***	***	1	***	***	***
Denver Midtown Surgery Center	Denver	1	***	***	***	0	***	***	***
Loveland Surgery Center	Loveland	3	***	***	***	3	***	***	***
Orthopaedic Center of the Rockies	Fort Collins	280	0	0.0	Same	329	0	0.0	Same
Rocky Mountain Surgery Center	Englewood	3	***	***	***	9	***	***	***
Skyline Surgery Center	Loveland	6	***	***	***	7	***	***	***
Surgical Center at Premier	Colorado Springs	9	***	***	***	14	***	***	***

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.

National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.

See "National Healthcare Safety Network (NHSN) Report, Data Summary for 2006-2008, Issued December 2009" (Am J Infect Control 2009;37:783-805).

*** Indicates value not shown due to suppression of infections data

Infections data for ASCs with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These ASCs have met the reporting requirements.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Abdominal procedures

Background

The surgeries included in this section are hernia repairs and hysterectomies (abdominal and vaginal). These procedures can be performed as in- or outpatient procedures.

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

A hysterectomy is the surgical removal of the uterus typically performed by a gynecologist. Hysterectomy may be total (removing the body, fundus, and cervix of the uterus; often called "complete") or partial (removal of the uterine body while leaving the cervix intact; also called "supracervical"). The two types of hysterectomies are abdominal and vaginal. Removal of the uterus can occur either through the abdomen or the vagina.

Most hysterectomies are done through an abdominal incision. Vaginal hysterectomy is performed through the vaginal canal and has fewer complications than abdominal hysterectomies, as well as shorter hospital stays and shorter healing time.

Results

Tables 14 through 17 show facility specific data for SSI attributed to herniorrhaphies and hysterectomies as described above. The tables present data from surgeries performed from August 1, 2009 through July 31, 2010 and August 1, 2010 through July 31, 2011.

Each table lists all the healthcare facilities in Colorado that performed the procedure, the city where the facility is located, the number of procedures performed, the number of infections, the standardized infection ratio (SIR) based on the national infection data, and the comparison to the national infection data. For the definition of SIR refer to page 34 or see Appendix E. The three categories summarizing how a Colorado healthcare facility compares to the national infection data for procedure performed are:

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

The specific patient risk factors used to calculate the expected number of infections for herniorrhaphies are:

- Age
- American Society of Anesthesiologists Score (ASA score, describes the health of the patient)
- Length of the procedure
- Gender
- Outpatient versus inpatient

The specific patient risk factors used to calculate the expected number of infections for abdominal hysterectomies are:

- Age
- Receiving anesthesia
- American Society of Anesthesiologists Score (ASA score, describes the health of the patient)
- Length of the procedure
- Use of an endoscope
- Facility bed size

The specific patient risk factors used to calculate the expected number of infections for vaginal hysterectomies are:

- Age
- American Society of Anesthesiologists Score (ASA score, describes the health of the patient)
- Length of the procedure
- Facility has a medical school affiliation

Table 14: Hernia Repair Procedures, Inpatient and Outpatient Procedures for Hospitals, 2009 – 2010 and 2010 – 2011

Surgical Site Infections (SSI) in Hernia Procedures in Hospitals (In- and Outpatient Combined). Reporting Period: August 1, 2009-July 31, 2011.									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Animas Surgical Hospital	Durango	8	***	***	***	6	***	***	***
Arkansas Valley Regional Medical Center	La Junta	55	2	6.0	Same	44	0	0.0	Same
Aspen Valley Hospital	Aspen	80	0	0.0	Same	57	0	0.0	Same
Boulder Community Hospital	Boulder	334	2	0.9	Same	318	1	0.4*	Same
Boulder Community Hospital-Foothills	Boulder	126	0	0.0	Same	180	2	1.4	Same
Centura Avista Adventist Hospital	Louisville	174	0	0.0	Same	192	1	0.7	Same
Centura Littleton Adventist Hospital	Littleton	171	3	2.1	Same	188	2	1.2	Same
Centura Penrose St. Francis Health	Colorado Springs	299	6	1.9	Same	395	9	2.4	Worse
Centura Porter Adventist Hospital	Denver	234	8	3.8*	Worse	216	0	0.0	Same
Centura St. Anthony Hospital	Lakewood	264	3	1.3	Same	338	3	0.9	Same
Centura St. Anthony North Hospital	Westminster	164	2	1.4	Same	204	0	0.0	Same
Centura St. Francis Medical Center	Colorado Springs	84	1	1.2	Same	72	3	3.1	Same
Centura St. Mary Corwin Medical Center	Pueblo	215	5	2.4	Same	253	2	0.8	Same

Surgical Site Infections (SSI) in Hernia Procedures in Hospitals (In- and Outpatient Combined). Reporting Period: August 1, 2009-July 31, 2011.									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Centura St. Thomas More Hospital	Canon City	102	0	0.0	Same	122	0	0.0	Same
Children's Hospital Colorado	Aurora	317	0	0.0++	Same	670	2	0.5	Same
Colorado Plains Medical Center	Fort Morgan	37	0	0.0	Same	62	0	0.0	Same
Community Hospital	Grand Junction	288	6	2.3*	Same	255	2	0.8	Same
Delta County Memorial Hospital	Delta	95	0	0.0	Same	110	0	0.0	Same
Denver Health Medical Center	Denver	296	4	1.4	Same	367	3	0.9	Same
East Morgan County Hospital	Brush	40	0	0.0	Same	43	0	0.0	Same
Estes Park Medical Center	Estes Park	37	0	0.0	Same	21	0	0.0	Same
Exempla Good Samaritan Medical Center	Lafayette	592	2	0.6*	Same	665	2	0.4*	Same
Exempla Lutheran Medical Center	Wheat Ridge	427	10	2.1	Worse	454	2	0.4	Same
Exempla St. Joseph Hospital	Denver	393	7	1.6*	Same	428	2	0.4*	Same
Grand River Medical Center	Rifle	35	0	0.0	Same	90	0	0.0	Same
Gunnison Valley Hospital	Gunnison	44	0	0.0	Same	43	1	5.4	Same
Heart of the Rockies Regional Medical Center	Salida	80	1	1.3	Same	79	1	1.4*	Same
Kit Carson Memorial Hospital	Burlington	25	0	0.0	Same	6	***	***	***
Kremmling Memorial Hospital	Kremmling	12	***	***	***	5	***	***	***

Surgical Site Infections (SSI) in Hernia Procedures in Hospitals (In- and Outpatient Combined). Reporting Period: August 1, 2009-July 31, 2011.									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Lincoln Community Hospital	Hugo	8	***	***	***	6	***	***	***
Longmont United Hospital	Longmont	172	0	0.0	Same	149	3	1.9*	Same
McKee Medical Center	Loveland	124	0	0.0	Same	158	2	0.8	Same
Medical Center of Aurora	Aurora	477	5	1.5	Same	484	8	2.3	Worse
Medical Center of the Rockies	Loveland	379	3	0.7	Same	366	2	0.5	Same
Melissa Memorial	Holyoke	4	***	***	***	16	***	***	***
Memorial Hospital Central	Colorado Springs	731	6	0.9*	Same	863	7	0.9*	Same
Memorial Hospital North	Colorado Springs	251	1	0.5	Same	200	1	0.7*	Same
Mercy Regional Medical Center	Durango	69	1	1.2	Same	61	0	0.0	Same
Montrose Memorial Hospital	Montrose	170	5	3.2	Worse	249	4	2.4*	Same
Mt. San Rafael Hospital	Trinidad	32	0	0.0	Same	8	***	***	***
North Colorado Medical Center	Greeley	308	4	1.5	Same	325	4	1.0	Same
North Suburban Medical Center	Thornton	139	1	0.8	Same	138	1	0.6	Same
Parker Adventist Hospital	Parker	332	1	0.4*	Same	356	0	0.0	Same
Parkview Medical Center	Pueblo	298	1	0.4++*	Same	333	0	0.0++*	Same
Pikes Peak Regional Hospital	Woodland Park	35	0	0.0	Same	40	0	0.0	Same
Pioneers Medical Center	Meeker	0	***	***	***	3	***	***	***
Platte Valley Medical Center	Brighton	160	3	3.0	Same	176	0	0.0	Same
Poudre Valley Hospital	Fort Collins	279	1	0.3*	Same	287	1	0.3*	Same

Surgical Site Infections (SSI) in Hernia Procedures in Hospitals (In- and Outpatient Combined). Reporting Period: August 1, 2009-July 31, 2011.									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Presbyterian St Luke's Medical Center	Denver	554	2	0.6*	Same	641	1	0.3	Same
Prowers Medical Center	Lamar	20	0	0.0	Same	45	1	1.6	Same
Rose Medical Center	Denver	298	1	0.3*	Same	282	3	0.8*	Same
San Luis Valley Regional Medical Center	Alamosa	125	0	0.0	Same	136	0	0.0	Same
Sedgwick County Memorial Hospital	Julesburg	0	***	***	***	4	***	***	***
Sky Ridge Medical Center	Lone Tree	344	0	0.0	Same	390	1	0.3*	Same
Southeast Colorado Hospital	Springfield	7	***	***	***	5	***	***	***
Southwest Memorial Hospital	Cortez	80	0	0.0	Same	69	0	0.0	Same
Spanish Peaks Regional Health Center	Walsenburg	7	***	***	***	8	***	***	***
St. Anthony Summit Medical Center	Frisco	10	***	***	***	28	0	0.0	Same
St. Mary's Hospital	Grand Junction	193	5	2.1	Same	207	1	0.3	Same
St. Vincent General Hospital District	Leadville	29	0	0.0	Same	12	***	***	***
Sterling Regional Medical Center	Sterling	96	0	0.0*	Same	79	0	0.0	Same
Swedish Medical Center	Englewood	253	4	1.0*	Same	291	3	0.6	Same
The Memorial Hospital	Craig	23	0	0.0	Same	0	***	***	***
University of Colorado Hospital	Aurora	310	9	2.3*	Worse	334	5	1.3*	Same

Surgical Site Infections (SSI) in Hernia Procedures in Hospitals (In- and Outpatient Combined). Reporting Period: August 1, 2009-July 31, 2011.									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Vail Valley Medical Center	**Vail**	125	1	1.5	Same	109	0	0.0	Same
Valley View Hospital	**Glenwood Springs**	236	2	1.4	Same	238	1	0.8	Same
Wray Community Hospital	**Wray**	27	0	0.0	Same	39	0	0.0	Same
Yampa Valley Medical Center	**Steamboat Springs**	85	0	0.0	Same	99	0	0.0	Same
Yuma District Hospital	**Yuma**	13	***	***	***	18	***	***	***

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.
National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.
See "Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network" (Inf Control and Hosp Epi, October 2011, Vol 32, No 10, pp. 970-986).
* Indicates that the expected number of infections used in SIR is not accurately calculated due to very high risk procedures being excluded from the calculation.
++ Indicates that the facility did not provide all data needed to calculate an accurate SIR.
*** Indicates value not shown due to suppression of infections data.
Infections data for hospitals with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements.
Source: National Healthcare Safety Network (NHSN) Database.
Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Table 15: Hernia Repair Procedures, Outpatient Procedures for Ambulatory Surgery Centers, 2009 – 2010 and 2010 – 2011

Surgical Site Infections (SSI) in Hernia Procedures in Ambulatory Surgery Centers (Outpatient) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
ASC Durango at Mercy Medical Center	Durango	46	0	0.0[++]	Same	56	0	0.0[++]	Same
Aberdeen Ambulatory Surgical Center	Pueblo	2	***	***	***	2	***	***	***
Arkansas Valley Surgery Center	Canon City	86	0	0.0	Same	84	0	0.0	Same
Audubon Ambulatory Surgery Center	Colorado Springs	29	0	0.0	Same	18	***	***	***
Audubon Ambulatory Surgery Center at St. Francis	Colorado Springs	441	0	0.0	Same	522	3	1.3	Same
Black Canyon Surgical Center	Montrose	34	1	6.2	Same	36	0	0.0	Same
Boulder Medical Center	Boulder	57	0	0.0	Same	68	0	0.0	Same
Centrum Surgical Center	Greenwood Village	7	***	***	***	9	***	***	***
Children's North Surgery Center	Broomfield	13[++]	***	***	***	24	0	0.0	Same
Clear Creek Surgery Center	Wheat Ridge	388	2	1.4	Same	383	1	0.7	Same
Colorado Springs Surgery Center	Colorado Springs	18	***	***	***	1	***	***	***
Crown Point Surgery Center	Parker	264	0	0.0	Same	309	1	0.8	Same
Denver Midtown Surgery Center	Denver	235	0	0.0	Same	225	0	0.0	Same
First Choice Outpatient Surgery Center at Community Hospital	Grand Junction	116	0	0.0	Same	121	1	1.6	Same
Grand Valley Surgical Center	Grand Junction	199	0	0.0	Same	221	0	0.0	Same

Surgical Site Infections (SSI) in Hernia Procedures in Ambulatory Surgery Centers (Outpatient) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Harmony Ambulatory Surgery Center	**Fort Collins**	475	1	0.4*	Same	490	1	0.5	Same
Kaiser Permanente Ambulatory Surgery Center	**Denver**	879	6	1.3	Same	770	5	1.3	Same
Lakewood Surgical Center	**Lakewood**	24	0	0.0	Same	0	***	***	***
Lincoln Surgery Center	**Parker**	21	0	0.0	Same	73	0	0.0	Same
Longmont Surgery Center	**Longmont**	141	0	0.0	Same	165	0	0.0	Same
MCR Surgery Center	**Loveland**	7	***	***	***	1	***	***	***
Midvalley Ambulatory Surgery Center	**Basalt**	0	***	***	***	3	***	***	***
Minimally Invasive Spinal Institute	**Lafayette**	6	***	***	***	1	***	***	***
North Suburban Surgery Center	**Thornton**	123	0	0.0	Same	108	0	0.0	Same
Parkwest Surgery Center	**Pueblo**	22	0	0.0	Same	8	***	***	***
Peak One Surgery Center	**Frisco**	33	0	0.0	Same	41	0	0.0	Same
Pueblo Surgery Center	**Pueblo**	15	***	***	***	14	***	***	***
Renewal Surgery Center	**Lone Tree**	0	***	***	***	7	***	***	***
Rocky Mountain Surgery Center	**Englewood**	183	0	0.0++	Same	362	1	1++	Same
Rose Surgical Center	**Denver**	478	1	0.5	Same	459	0	0.0	Same
Sky Ridge Surgical Center	**Lone Tree**	188	0	0.0	Same	240	0	0.0	Same
Skyline Surgery Center	**Loveland**	160	0	0.0	Same	142	0	0.0	Same
Summit View Surgery Center	**Littleton**	293	1	0.9	Same	286	0	0.0	Same
Surgery Center At Lutheran	**Wheat Ridge**	129	0	0.0	Same	130	0	0.0	Same

Surgical Site Infections (SSI) in Hernia Procedures in Ambulatory Surgery Centers (Outpatient) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Surgery Center At Printers Park	**Colorado Springs**	43	0	0	Same	28	0	0	Same
Surgery Center of Fort Collins	**Fort Collins**	7	***	***	***	8	***	***	***
Surgical Center at Premier	**Colorado Springs**	75	0	0	Same	62	0	0	Same

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.
National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.
See "Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network" (Inf Control and Hosp Epi, October 2011, Vol 32, No 10, pp. 970-986).
* Indicates that the expected number of infections used in SIR is not accurately calculated due to very high risk procedures being excluded from the calculation
++ Indicates that the facility did not provide all data needed to calculate an accurate SIR
*** Indicates value not shown due to suppression of infections data, or no National or historical rate, or an expected count of zero, to which to compare facility rate.
Infections data for ASCs with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These ASCs have met the reporting requirements.
Source: National Healthcare Safety Network (NHSN) Database.
Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Table 16: Abdominal Hysterectomies, Inpatient and Outpatient Procedures for Hospitals, 2009 – 2010 and 2010 – 2011

Surgical Site Infections (SSI) in Abdominal Hysterectomies in Hospitals (In/Out-Patient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Animas Surgical Hospital	Durango	27	0	0.0	Same	20	0	0.0	Same
Arkansas Valley Regional Medical Center	La Junta	5	***	***	***	5	***	***	***
Aspen Valley Hospital	Aspen	5	***	***	***	8	***	***	***
Boulder Community Hospital	Boulder	27	0	0.0	Same	4	***	***	***
Boulder Community Hospital-Foothills	Boulder	46	0	0.0	Same	32	1	1.6	Same
Centura Avista Adventist Hospital	Louisville	56	0	0.0	Same	45	1	1.2	Same
Centura Littleton Adventist Hospital	Littleton	83	2	1.4	Same	76	0	0.0	Same
Centura Penrose St. Francis Health	Colorado Springs	194	10	2.2	Worse	153	5	1.4	Same
Centura Porter Adventist Hospital	Denver	109	1	0.7	Same	123	1	0.6	Same
Centura St. Anthony Hospital	Lakewood	108	1	0.5	Same	58	1	1.0	Same
Centura St. Anthony North Hospital	Westminster	31	0	0.0	Same	22	0	0.0	Same
Centura St. Francis Medical Center	Colorado Springs	210	3	0.8	Same	202	3	0.8	Same
Centura St. Mary Corwin Medical Center	Pueblo	65	2	1.7	Same	44	0	0.0	Same
Centura St. Thomas More Hospital	Canon City	35	0	0.0	Same	25	0	0.0	Same

Surgical Site Infections (SSI) in Abdominal Hysterectomies in Hospitals (In/Out-Patient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Colorado Plains Medical Center	Fort Morgan	30	0	0.0	Same	25	0	0.0	Same
Community Hospital	Grand Junction	5	***	***	***	7	***	***	***
Delta County Memorial Hospital	Delta	35	0	0.0	Same	22	0	0.0	Same
Denver Health Medical Center	Denver	56	3	2.6	Same	51	0	0.0	Same
Estes Park Medical Center	Estes Park	3	***	***	***	0	***	***	***
Exempla Good Samaritan Medical Center	Lafayette	171	1	0.3	Same	139	1	0.4	Same
Exempla Lutheran Medical Center	Wheat Ridge	247	2	0.6	Same	287	4	1.0	Same
Exempla St. Joseph Hospital	Denver	380	8	1.1	Same	234	5	1.0	Same
Grand River Medical Center	Rifle	7	***	***	***	7	***	***	***
Gunnison Valley Hospital	Gunnison	18	***	***	***	16	***	***	***
Heart of the Rockies Regional Medical Center	Salida	12	***	***	***	7	***	***	***
Longmont United Hospital	Longmont	93	3	1.9	Same	59	1	1.0	Same
McKee Medical Center	Loveland	80	1	1.0	Same	47	1	1.3	Same
Medical Center of Aurora	Aurora	147	6	2.3	Same	82	1	0.7	Same
Medical Center of the Rockies	Loveland	44	0	0.0	Same	73	1	0.9	Same
Melissa Memorial	Holyoke	2	***	***	***	0	***	***	***
Memorial Hospital Central	Colorado Springs	223	3	0.9	Same	220	10	3.1	Worse
Memorial Hospital North	Colorado Springs	311	2	0.5	Same	216	1	0.4	Same
Mercy Regional Medical Center	Durango	109	1	0.8	Same	104	1	0.9	Same
Montrose Memorial Hospital	Montrose	54	1	1.0	Same	79	0	0.0	Same

Surgical Site Infections (SSI) in Abdominal Hysterectomies in Hospitals (In/Out-Patient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Mt. San Rafael Hospital	Trinidad	7	***	***	***	3	***	***	***
North Colorado Medical Center	Greeley	145	0	0	Same	120	1	0.5	Same
North Suburban Medical Center	Thornton	141	3	1.3	Same	121	1	0.5	Same
Parker Adventist Hospital	Parker	114	2	0.9	Same	90	0	0	Same
Parkview Medical Center	Pueblo	120	1	0.6	Same	99	2	1.4	Same
Pikes Peak Regional Hospital	Woodland Park	0	***	***	***	1	***	***	***
Platte Valley Medical Center	Brighton	36	2	3.9	Same	26	2	5.2	Same
Poudre Valley Hospital	Fort Collins	239	3	0.8	Same	267	3	0.8	Same
Presbyterian St. Luke's Medical Center	Denver	57	0	0	Same	50	0	0	Same
Prowers Medical Center	Lamar	25	0	0	Same	20	0	0	Same
Rose Medical Center	Denver	343	3	0.4	Same	409	1	0.1	Better
San Luis Valley Regional Medical Center	Alamosa	24	0	0	Same	12	***	***	***
Sky Ridge Medical Center	Lone Tree	209	1	0.3	Same	193	2	0.6	Same
Southwest Memorial Hospital	Cortez	1	***	***	***	2	***	***	***
St. Anthony Summit Medical Center	Frisco	34	0	0	Same	36	0	0	Same
St. Mary's Hospital	Grand Junction	187	1	0.3	Same	174	1	0.3	Same
Sterling Regional Medical Center	Sterling	5	***	***	***	6	***	***	***
Swedish Medical Center	Englewood	499	3	0.4	Same	460	6	0.7	Same
The Memorial Hospital	Craig	6	***	***	***	0	***	***	***

Surgical Site Infections (SSI) in Abdominal Hysterectomies in Hospitals (In/Out-Patient Combined) Reporting Period: August 1, 2009-July 31, 2011									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
University of Colorado Hospital	**Aurora**	177	7	1.2	Same	152	3	0.6	Same
Vail Valley Medical Center	**Vail**	17	***	***	***	12	***	***	***
Valley View Hospital	**Glenwood Springs**	12	***	***	***	30	1	1.9	Same
Yampa Valley Medical Center	**Steamboat Springs**	17	***	***	***	17	***	***	***
Yuma District Hospital	**Yuma**	3	***	***	***	0	***	***	***

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.

National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.

See "Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network" (Inf Control and Hosp Epi, October 2011, Vol 32, No 10, pp. 970-986).

*** Indicates value not shown due to suppression of infections data.

Infections data for hospitals with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Table 17: Vaginal Hysterectomies, Inpatient and Outpatient Procedures for Hospitals, 2009 – 2010 and 2010 – 2011

Surgical Site Infections (SSI) in Vaginal Hysterectomies in Hospitals (In/Out-Patient Combined). Reporting Period: August 1, 2009-July 31, 2011.									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Animas Surgical Hospital	Durango	43	0	0.0	Same	49	0	0.0	Same
Aspen Valley Hospital	Aspen	27	0	0.0	Same	18	***	***	***
Boulder Community Hospital	Boulder	16	***	***	***	63	1	2.8	Same
Boulder Community Hospital-Foothills	Boulder	14	***	***	***	13	***	***	***
Centura Avista Adventist Hospital	Louisville	33	1	5.3	Same	43	3	10.7	Worse
Centura Littleton Adventist Hospital	Littleton	215	1	0.8	Same	181	2	2.0	Same
Centura Penrose St. Francis Health	Colorado Springs	30	1	6.8	Same	58	1	3.7	Same
Centura Porter Adventist Hospital	Denver	132	0	0.0	Same	131	0	0.0	Same
Centura St. Anthony Hospital	Lakewood	62	1	3.0	Same	12	***	***	***
Centura St. Anthony North Hospital	Westminster	84	1	2.4	Same	79	0	0.0	Same
Centura St. Francis Medical Center	Colorado Springs	141	1	1.4	Same	183	5	5.5	Worse
Centura St. Mary Corwin Medical Center	Pueblo	40	0	0.0	Same	57	0	0.0	Same
Centura St Thomas More Hospital	Canon City	21	0	0.0	Same	22	1	7.5	Same
Colorado Plains Medical Center	Fort Morgan	13	***	***	***	13	***	***	***
Community Hospital	Grand Junction	50	0	0.0	Same	82	2	5.3	Same
Delta County Memorial Hospital	Delta	37	0	0.0	Same	29	0	0.0	Same
Denver Health Medical Center	Denver	49	1	1.5	Same	60	0	0.0	Same
Estes Park Medical Center	Estes Park	1	***	***	***	0	***	***	***

Surgical Site Infections (SSI) in Vaginal Hysterectomies in Hospitals (In/Out-Patient Combined). Reporting Period: August 1, 2009-July 31, 2011.									
Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Exempla Good Samaritan Medical Center	Lafayette	113	3	5.5	Worse	131	1	1.6	Same
Exempla Lutheran Medical Center	Wheat Ridge	140	1	1.5	Same	173	0	0.0	Same
Exempla St. Joseph Hospital	Denver	239	0	0.0	Same	327	0	0.0	Better
Grand River Medical Center	Rifle	21	0	0.0	Same	17	***	***	***
Longmont United Hospital	Longmont	96	0	0.0	Same	87	1	2.2	Same
McKee Medical Center	Loveland	155	3	3.2	Same	238	3	2.0	Same
Medical Center of Aurora	Aurora	115	0	0.0	Same	116	1	1.5	Same
Medical Center of the Rockies	Loveland	20	0	0.0	Same	16	***	***	***
Memorial Hospital Central	Colorado Springs	219	3	2.5	Same	340	6	3.3	Worse
Memorial Hospital North	Colorado Springs	159	4	4.7	Worse	209	5	4.1	Worse
Mercy Regional Medical Center	Durango	41	1	2.2	Same	22	0	0.0	Same
Montrose Memorial Hospital	Montrose	32	0	0.0	Same	34	1	5.7	Same
Mt. San Rafael Hospital	Trinidad	0	***	***	***	1	***	***	***
North Colorado Medical Center	Greeley	183	0	0.0	Same	178	0	0.0	Same
North Suburban Medical Center	Thornton	69	1	3.0	Same	46	0	0.0	Same
Parker Adventist Hospital	Parker	55	0	0.0	Same	59	0	0.0	Same
Parkview Medical Center	Pueblo	172	1	0.5	Same	187	1	0.4	Same
Pikes Peak Regional Hospital	Woodland Park	2	***	***	***	6	***	***	***
Platte Valley Medical Center	Brighton	17	***	***	***	18	***	***	***
Poudre Valley Hospital	Fort Collins	131	0	0.0	Same	139	1	0.6	Same

Surgical Site Infections (SSI) in Vaginal Hysterectomies in Hospitals (In/Out-Patient Combined). Reporting Period: August 1, 2009-July 31, 2011.

Health Facility and Region		2009-2010				2010-2011			
		Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison	Procedure Count	Infection Count	Standardized Infection Ratio (SIR)	National Comparison
Presbyterian St. Luke's Medical Center	**Denver**	36	1	2.4	Same	26	0	0.0	Same
Prowers Medical Center	**Lamar**	5	***	***	***	0	***	***	***
Rose Medical Center	**Denver**	160	0	0.0	Same	183	0	0.0	Same
San Luis Valley Regional Medical Center	**Alamosa**	40	0	0.0	Same	31	0	0.0	Same
Sky Ridge Medical Center	**Lone Tree**	216	6	5.1	Worse	292	2	1.2	Same
Southwest Memorial Hospital	**Cortez**	0	***	***	***	4	***	***	***
St. Anthony Summit Medical Center	**Frisco**	6	***	***	***	2	***	***	***
St. Mary's Hospital	**Grand Junction**	181	1	0.4	Same	215	4	1.4	Same
Sterling Regional Medical Center	**Sterling**	10	***	***	***	11	***	***	***
Swedish Medical Center	**Englewood**	141	1	0.6	Same	224	0	0.0	Same
University of Colorado Hospital	**Aurora**	84	0	0.0	Same	130	3	1.5	Same
Vail Valley Medical Center	**Vail**	39	1	4.7	Same	31	0	0.0	Same
Valley View Hospital	**Glenwood Springs**	26	3	21.1	Worse	38	2	8.6	Worse
Yampa Valley Medical Center	**Steamboat Springs**	47	0	0.0	Same	32	0	0.0	Same

The standardized infection ration (SIR) is the ratio of observed to expected infections, and is adjusted for procedure risk factors.

National comparison based on data collected and reported by NHSN-participating hospitals from 2006-2008.

See "Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network" (Inf Control and Hosp Epi, October 2011, Vol 32, No 10, pp. 970-986).

*** Indicates value not shown due to suppression of infections data.

Infections data for hospitals with fewer than 20 procedures performed in a 12-month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Central Line-Associated Bloodstream Infections Overview

Background

Catheter-associated bloodstream infections (CLABSI) are bloodstream infections that are associated with the presence of a central line within the 48-hour period. 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, withdraw blood or monitor fluid volume in patients. An umbilical catheter (i.e., a tube placed in the umbilical cord) is a central vascular catheter inserted through the umbilical artery or vein in a neonate (infant ≤ 30 days old). Central lines can be either permanent or temporary. Permanent lines are those that are tunneled, or more specifically, lines that are tunneled under the skin before entering a great vessel. These can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled. Permanent lines are commonly used in long-term acute care hospitals patients and historically have had lower rates of infection than temporary lines. For pictures of central lines, refer to Appendix F.

All patients with a central line are at risk for a CLABSI. However, certain groups are at higher risk for infection: elderly, neonates, dialysis patients, those patients whose immune system is very weak or absent (e.g., cancer patients, transplant patients), diabetics, and those patients who have suffered a burn injury.

Like SSI, CLABSI have devastating impacts on patients' lives and are costly for patients, healthcare payers, health facilities and consumers. Additionally, they can be easily detected and prevented by following established prevention techniques.[12] CLABSI often lead to additional days in the hospital, which can be expensive for healthcare payers, healthcare organizations, and patients. An estimated 248,000 bloodstream infections occur in U.S. hospitals each year[13] and a large proportion of these are associated with the presence of a central vascular catheter. Seventy-eight thousand (78,000) CLABSI are estimated to occur yearly in United States hospitals and dialysis units.[14] Additional costs range between $7,288 to $29,156 per episode of infection.[15] Evidence suggests that reporting of infections may lead to better adherence to preventive practices and decrease medical complications or death.

Reporting central line data by facility type, central line type, and critical care unit allows for fairer comparisons between health facilities as it takes into account how differences in care and patients' risk for infection lead to differences in infection rates.

Adult Critical Care Units

The facilities report CLABSI data by the following NHSN defined critical care units:

- **Medical/Surgical Critical Care**: unit for critically ill patients who are being treated for medical conditions, surgical conditions, or both.
- **Medical Cardiac Critical Care**: unit that specializes in care of patients with serious heart problems that do not require heart surgery
- **Surgical Cardiothoracic Critical Care**: unit 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).
- **Medical Critical Care**: unit for patients who are being treated for non-surgical conditions
- **Surgical Critical Care**: unit for the evaluation and managements of patients with serious illness before and/or after surgery.

Most hospitals do not have all five critical care units. Hospitals decide which type of CCU they have by measuring the type of patients that are cared for in that area. For instance, the medical CCU serves non-surgical patients, so if a facility finds that the majority of their critical care patients are non-surgical, that facility would have a medical CCU according to the NHSN definitions.

Results

Table 18 shows facility specific data for CLABSI attributed to the five CCU types discussed above. The tables contain data from August 1, 2010, through July 31, 2011.

Each table lists all the hospitals in Colorado with that type of critical 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 comparison to the national infection rate. The number of central line days is the total number of days a central line was used in the CCU during the reporting period. The CLABSI rate is the number of infections per 1,000 central line days. The three categories summarizing how a Colorado hospital compares to the national infection rate for that CCU are:

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

See Appendix E for a description about using the Standardized Infection Ratio for the comparison to national infection rates.

Table 18: Adult Critical Care Unit CLABSI Rates, 2010 – 2011

Central Line Associated Bloodstream Infections (CLABSI) in Hospitals by Critical Care Unit. Reporting Period: August 1, 2010-July 31, 2011.							
Health Facility, Region, and Unit Type			**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Arkansas Valley Regional Medical Center	**La Junta**	**Medical/Surgical, ≤ 15 beds**	175	0	0.0	1.1	Same
Aspen Valley Hospital	**Aspen**	**Medical/Surgical, ≤ 15 beds**	40	***	***	1.1	***
Boulder Community Hospital	**Boulder**	**Medical/Surgical**	1,814	1	0.6	1.0	Same
Boulder Community Hospital-Foothills	**Boulder**	**Medical**	234	0	0.0	1.3	Same
Centura Avista Adventist Hospital	**Louisville**	**Medical/Surgical**	408	0	0.0	1.0	Same
Centura Littleton Adventist Hospital	**Littleton**	**Medical/Surgical**	2,677	3	1.1	1.0	Same
Centura Penrose St. Francis Health	**Colorado Springs**	**Medical/Surgical**	2,986	3	1.0	1.0	Same
Centura Porter Adventist Hospital	**Denver**	**Medical/Surgical**	3,803	5	1.3	1.0	Same
Centura St. Anthony Hospital	**Lakewood**	**Medical**	1,884	1	0.5	1.3	Same
		Medical/Surgical	2,568	1	0.4	1.0	Same
		Surgical Cardiothoracic	1,669	3	1.8	0.9	Same
		Surgical	1,166	2	1.7	1.0	Same
Centura St. Anthony North Hospital	**Westminster**	**Medical**	2,544	6	2.4	1.3	Same
Centura St. Francis Medical Center	**Colorado Springs**	**Medical/Surgical, ≤ 15 beds**	425	1	2.4	1.1	Same
Centura St. Mary Corwin Medical Center	**Pueblo**	**Medical/Surgical**	2,263	3	1.3	1.0	Same
Centura St. Thomas More Hospital	**Canon City**	**Medical/Surgical, ≤ 15 beds**	205	0	0.0	1.1	Same
Colorado Plains Medical Center	**Fort Morgan**	**Medical/Surgical, ≤ 15 beds**	58	0	0.0	1.1	Same
Community Hospital	**Grand Junction**	**Medical/Surgical, ≤ 15 beds**	449	0	0.0	1.1	Same
Delta County Memorial Hospital	**Delta**	**Medical/Surgical, ≤ 15 beds**	438	0	0.0	1.1	Same
Denver Health Medical Center	**Denver**	**Medical-Major teaching**	2,762	1	0.4	1.8	Same
East Morgan County Hospital	**Brush**	**Medical/Surgical, ≤ 15 beds**	8	***	***	1.1	***

Central Line Associated Bloodstream Infections (CLABSI) in Hospitals by Critical Care Unit. Reporting Period: August 1, 2010-July 31, 2011.							
Health Facility, Region, and Unit Type			**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Rate**	**National Comparison**
Exempla Good Samaritan Medical Center	**Lafayette**	**Medical/Surgical**	2,406	3	1.2	1.0	Same
Exempla Lutheran Medical Center	**Wheat Ridge**	**Medical Cardiac**	1,917	2	1.0	1.3	Same
		Medical/Surgical	3,530	4	1.1	1.0	Same
Exempla St. Joseph Hospital	**Denver**	**Medical/Surgical - Major teaching**	4,757	1	0.2	1.4	Better
Gunnison Valley Hospital	**Gunnison**	**Medical/Surgical, ≤ 15 beds**	0	0	***	1.1	***
Heart of the Rockies Regional Medical Center	**Salida**	**Medical/Surgical - Major teaching**	21	***	***	1.4	***
Longmont United Hospital	**Longmont**	**Medical/Surgical**	3,078	0	0.0	1.0	Same
McKee Medical Center	**Loveland**	**Medical/Surgical, ≤ 15 beds**	705	0	0.0	1.1	Same
Medical Center of Aurora	**Aurora**	**Medical/Surgical**	5,034	8	1.6	1.0	Same
Medical Center of the Rockies-North Wing	**Loveland**	**Medical/Surgical - Major teaching**	1,757	0	0.0	1.4	Same
Medical Center of the Rockies-South Wing	**Loveland**	**Medical/Surgical - Major teaching**	1,674	0	0.0	1.4	Same
Memorial Hospital Central	**Colorado Springs**	**Medical/Surgical**	5,600	4	0.7	1.0	Same
Memorial Hospital North	**Colorado Springs**	**Medical/Surgical, ≤ 15 beds**	358	0	0.0	1.1	Same
Mercy Regional Medical Center	**Durango**	**Medical/Surgical - Major teaching**	1,227	0	0.0	1.4	Same
Montrose Memorial Hospital	**Montrose**	**Medical/Surgical, ≤ 15 beds**	336	0	0.0	1.1	Same
North Colorado Medical Center	**Greeley**	**Medical Cardiac**	1,017	0	0.0	1.3	Same
		Medical/Surgical	2,458	0	0.0	1.0	Same
North Suburban Medical Center	**Thornton**	**Medical/Surgical**	1,732	1	0.6	1.0	Same
Parker Adventist Hospital	**Parker**	**Medical/Surgical**	1,321	2	1.5	1.0	Same
Parkview Medical Center	**Pueblo**	**Medical/Surgical - Major teaching**	1,361	0	0.0	1.4	Same
Platte Valley Medical Center	**Brighton**	**Medical**	1,169	0	0.0	1.3	Same
Poudre Valley Hospital	**Fort Collins**	**Medical/Surgical - Major teaching**	1,792	0	0.0	1.4	Same

Central Line Associated Bloodstream Infections (CLABSI) in Hospitals by Critical Care Unit.
Reporting Period: August 1, 2010-July 31, 2011.

Health Facility, Region, and Unit Type			Central Line Days	CLABSI	CLABSI Rate	National Rate	National Comparison
Presbyterian St. Luke's Medical Center	Denver	Medical/Surgical - Major teaching	2,350	0	0.0	1.4	Same
Rose Medical Center	Denver	Medical/Surgical - Major teaching	2,366	3	1.3	1.4	Same
San Luis Valley Regional Medical Center	Alamosa	Medical/Surgical, ≤ 15 beds	235	0	0.0	1.1	Same
Sky Ridge Medical Center	Lone Tree	Medical/Surgical	2,439	5	2.1	1.0	Same
Southwest Memorial Hospital	Cortez	Medical/Surgical, ≤ 15 beds	177	0	0.0	1.1	Same
St. Anthony Summit Medical Center	Frisco	Medical/Surgical, ≤ 15 beds	99	0	0.0	1.1	Same
St. Mary's Hospital	Grand Junction	Surgical Cardiothoracic	4,313	1	0.2	0.9	Same
Sterling Regional Medical Center	Sterling	Medical/Surgical, ≤ 15 beds	159	0	0.0	1.1	Same
Swedish Medical Center	Englewood	Medical/Surgical - Major teaching	7,925	9	1.1	1.4	Same
University of Colorado Hospital	Aurora	Medical Cardiac	1,142	1	0.9	1.3	Same
		Medical	3,712	8	2.2	1.8	Same
		Surgical	3,299	6	1.8	1.4	Same
Vail Valley Medical Center	Vail	Medical/Surgical, ≤ 15 beds	235	0	0.0	1.1	Same
Valley View Hospital	Glenwood Springs	Medical/Surgical, ≤ 15 beds	204	0	0.0	1.1	Same
Yampa Valley Medical Center	Steamboat Springs	Medical/Surgical, ≤ 15 beds	36	***	***	1.1	***

Facility CLABSI rates are per 1,000 central line-days.

National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2010.

See "National Healthcare Safety Network (NHSN) Report, Data Summary for 2010", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention.

*** Indicates value not shown due to suppression of infections data.

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

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Long-Term Acute Care Hospitals

Background

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

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, withdraw blood or monitor fluid volume in patients. LTACH report infection data for patients with either permanent or temporary central lines. Permanent lines are those that are tunneled, or more specifically, lines that are tunneled under the skin before entering a great vessel. These can include certain dialysis lines and implanted catheters such as a port. Temporary lines are those that are not tunneled. Permanent lines are commonly used in LTACH patients and historically have had lower rates of infection than temporary lines. For pictures of central lines, refer to Appendix F.

Results

Table 19 shows facility specific data for CLABSI in LTACH. The table contains data from August 1, 2010, through July 31, 2011.

Each table lists all the LTACH in Colorado, 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 comparison to the national infection rate. The number of central line days is the total number of days a central was used in the LTACH during the reporting period. The central line-associated bloodstream infection rate is the number of infections per 1,000 central line days. The three categories summarizing how a Colorado hospital compares to the national infection rate for that LTACH facility are:

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

See Appendix E for a description about using the Standardized Infection Ratio for the comparison to national infection rates.

Table 19: Long-Term Acute Care Hospital CLABSI Rates, 2010 – 2011

Central Line Associated Bloodstream Infections (CLABSI) in Long-term Acute Care Hospitals (LTACH). Reporting Period: August 1, 2010-July 31, 2011.					
Health Facility and Region		**Central Line Days**	**CLABSI**	**CLABSI Rate**	**National Comparison (National Rate = 1.3)**
Colorado Acute Long-Term Hospital	**Denver**	6,710	6	0.9	Same
Craig Hospital	**Englewood**	4,835	1	0.2	Better
Kindred Hospital	**Denver**	4,985	9	1.8	Same
Northern Colorado Long-Term Acute Hospital	**Johnstown**	3,709	6	1.6	Same
Select Long-Term Care Hospital	**Colorado Springs**	4,248	4	0.9	Same
Select Specialty Hospital South Campus	**Denver**	4,678	2	0.4	Same
Select Specialty Hospital	**Denver**	5,818	4	0.7	Same
Triumph Acute Long-Term Care Hospital of Aurora	**Aurora**	4,151	9	2.2	Same
Vibra Long-Term Acute Care Hospital	**Thornton**	7,418	2	0.3	Better

Central line-associated infection rates are per 1,000 central line-days.

National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2010.

See "National Healthcare Safety Network (NHSN) Report, Data Summary for 2010", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Neonatal Critical Care Units

Background

Level III NCCU provide care to the sickest newborn infants while Level I units would care for healthy newborn infants. Level III NCCU 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 NCCU have a neonatologist on duty at all times. Neonatologists are pediatricians with additional training in treating newborn babies that need special care. The designation between Level III and Level II/III is defined by the NHSN reporting guidelines. If a hospital does not separate infants in the unit that are receiving Level II care and those receiving Level III care, that hospital reports data as a Level II/III combined NCCU.

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, withdraw blood or monitor fluid volume in patients. An umbilical catheter (i.e., a tube placed in the umbilical cord) is a central vascular catheter inserted through the umbilical artery or vein in a neonate (infant ≤ 30 days old). For pictures of central lines, refer to Appendix F.

Results

Table 20 shows the results of data collected in each NCCU. The reporting period is from August 1, 2010, through July 31, 2011. The rates are risk stratified by the following birth weight categories:

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	(1,501-2500 grams)
5. Greater than 5.5 pounds	(>2,500 grams)

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 NCCU for two months and has a body weight of 3.3 pounds when an infection develops the recorded birth weight would still be 1.66 pounds. (See Appendix E for the calculation description for the NCCU infection data).

Additionally the rates are risk stratified by the type of infection: central line associated bloodstream infection and umbilical catheter associated infection.

Each table lists the hospital name, NCCU level, the city where the hospital is located, the number of catheter (central or umbilical line) days, the number of infections, the infection rate, the national infection rate, and the comparison to the national infection rate. The number of catheter days is the total number of days a catheter was used in the NCCU during the reporting period. The infection rate is the number of infections per 1,000 catheter days. The three categories summarizing how a Colorado hospital compares to the national infection rate for that NCCU are:

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

See Appendix E for a description about using the Standardized Infection Ratio for the comparison to national infection rates.

Cautions

There are some cautions consumers should be made aware 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 became infected. For example, bloodstream infections in newborns with major intestinal problems are common because bacteria in the intestine can access the bloodstream very easily. The clinical picture must be looked at in its entirety to determine whether the bloodstream infection was primary or secondary to another source site.

National rates for NCCU BSI (number of infections/1000 catheter days)

Birth weight	Level II/III	Level III
≤ 750g	2.9	2.6
751-1,000g	2.3	2.2
1,001-1,500g	1.4	1.0
1,501-2,500g	1.0	1.0
≥ 2,501g	0.7	0.8

Table 20: Neonatal Critical Care Unit CLABSI and UCABI Rates, 2010 – 2011

Umbilical Catheter Associated Bloodstream Infections (UCABI) and Central Line Associated Bloodstream Infections (CLABSI), Combined, in the Neonatal Critical Care Units
Reporting Period: August 1, 2010-July 31, 2011

Health Facility and Region			Line Days	BSI	BSI Rate	National Comparison
Centura Avista Adventist Hospital	Louisville	Level II/III	179	0	0.0	Same
Centura Littleton Adventist Hospital	Littleton	Level III	401	1	2.5	Same
Centura St Francis Medical Center	Colorado Springs	Level II/III	1,164	0	0.0	Same
Children's Hospital Colorado	Aurora	Level III	4,260	10	2.3	Same
Denver Health Medical Center	Denver	Level II/III	1,062	1	0.9	Same
Exempla Lutheran Medical Center	Wheat Ridge	Level II/III	340	0	0.0	Same
Exempla St Joseph Hospital	Denver	Level II/III	1,270	1	0.8	Same
Medical Center of Aurora	Aurora	Level II/III	58	0	0.0	Same
Memorial Hospital Central	Colorado Springs	Level III	2,610	5	1.9	Same
Parker Adventist Hospital	Parker	Level II/III	244	0	0.0	Same
Poudre Valley Hospital	Fort Collins	Level II/III	1,046	1	1.0	Same
Presbyterian St. Luke's Medical Center	Denver	Level III	4,201	6	1.4	Same
Rose Medical Center	Denver	Level II/III	446	0	0.0	Same
Sky Ridge Medical Center	Lone Tree	Level II/III	128	0	0.0	Same
St. Mary's Hospital	Grand Junction	Level III	925	0	0.0	Same
Swedish Medical Center	Englewood	Level II/III	399	0	0.0	Same
University of Colorado Hospital	Aurora	Level II/III	2,578	1	0.4	Same

Facility UCABI rates are per 1,000 umbilical catheter-days. Facility CLABSI rates are per 1,000 central line-days.

National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2010.

See "National Healthcare Safety Network (NHSN) Report, Data Summary for 2010", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention.

Source: National Healthcare Safety Network (NHSN) Database.

Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Dialysis Related-Infection Overview

Background

This section focuses on dialysis-related infections (DRI) acquired in outpatient dialysis treatment centers (DTC). Reporting dialysis centers in Colorado monitor patients for any of the three specific events that trigger a report: 1) an overnight hospital stay, 2) an outpatient start of an intravenous antimicrobial, and 3) a positive blood culture. More than one type of event may be recorded on a single patient's report. This report depicts counts and rates of vascular access infections, which include two different types of dialysis-related infections: local access infections (LAI) and access-related bacteremia (ARB). An LAI infection is defined as the presence of pus, redness, or swelling of the vascular access site without the presence of an ARB. An ARB infection, which has a much more serious impact on a patient's health and requires a higher level of care, is defined as the presence of a microorganism identified in a blood culture where the source of infection was reported as the vascular access site. Although an LAI is not as severe as an ARB infection, antibiotics will usually be administered in either case. The infection data is risk stratified for the four dialysis access types (fistulas, grafts, permanent and temporary central lines). Descriptions of the access types can be found in Appendix F.

Colorado's Disclosure Law requires the reporting of infections in patients receiving dialysis in outpatient centers. According to the National Institute of Diabetes and Digestive and Kidney Diseases 2010 figures[16], more than 20 million people ages 20 years and older, have chronic kidney disease in the United States. In 2008, 547,982 patients in the United States were under treatment with chronic dialysis. Dialysis patients require a vascular access, which can either be a catheter or large blood vessel with a surgically performed graft or fistula that can be accessed to remove and replace blood. Vascular access types, listed according to increasing risk of infection, include arteriovenous fistulas (connections between two vessels that normally do not connect created from the patient's own blood vessels), arteriovenous grafts (connections between two vessels that normally do not connect constructed from synthetic materials), tunneled (permanent) central lines, and non-tunneled (temporary) central lines. Port access devices for dialysis have been removed from the market, but some existing ports are still in use. The risk of infection is relatively high in these devices. See Appendix F for detailed descriptions of the dialysis access types.

Colorado is the first state in the nation to implement mandatory reporting of DRI, and the first state to use NHSN to formally report DRI.

Surveillance for DRI in Colorado occurs within outpatient dialysis centers only and excludes peritoneal and home dialysis. The outpatient facilities monitored may be dedicated, stand-alone facilities, hospital-based or affiliated units that primarily serve this patient population. The reporting of DRI began in March 2010, and currently, there are 61 dialysis centers reporting to NHSN.

Results

Table 21 shows the number and rates of LAI and ARB infections for each DTC in Colorado. The reporting period is March 1, 2010 through April 30, 2011. Colorado DTC began reporting data March 1, 2010 and NHSN changed the surveillance definition in May 2011, therefore only 13 months of comparable data is available. Each table lists the facility name, city of location, number of dialysis patients, number of ARB infections, ARB infection rate, and comparison to the national ARB rate, number of LAI, LAI rate, and comparison to the national LAI rate. The infection rate is per 100 patients. The three categories summarizing how a Colorado dialysis treatment center compares to the national infection rate for that DTC are:

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

See Appendix E for a description about using the Standardized Infection Ratio for the comparison to national infection rates.

National dialysis-related infection rates by access type and infection type (number of infections/100 patients)

Access type	Access-related bacteremia	Local access infection
Fistula	0.2	0.2
Graft	0.4	0.4
Non-tunneled central line	17.8	5.1
Tunneled central line	3.1	1.7

Table 21: Dialysis-Related Infections, 2010 – 2011

Dialysis-Related Infections (Access-Related Bacteremia: ARB and Local Access Infection: LAI) in Outpatient Dialysis Clinics. Reporting Period: March 1, 2010 - April 30, 2011.								
Dialysis Centers and Region		**Number of patients**	**ARB count**	**ARB rate**	**National comparison**	**LAI count**	**LAI rate**	**National comparison**
Alamosa Dialysis	**Alamosa**	654	4	0.6	Same	6	0.9	Same
Arvada Dialysis Center	**Arvada**	318	0	0.0	Same	2	0.6	Same
Aurora Dialysis Center	**Aurora**	2005	3	0.1	Better	5	0.2	Same
Belcaro Dialysis Center	**Denver**	878	12	1.4	Worse	6	0.7	Same
Black Canyon Dialysis Center	**Montrose**	40	***	***	***	***	***	***
Boulder Dialysis Center	**Boulder**	421	4	1.0	Same	5	1.2	Worse
Brighton Dialysis	**Brighton**	697	14	2.0	Worse	3	0.4	Same
Commerce City Dialysis	**Commerce City**	755	1	0.1	Same	12	1.6	Worse
Cortez Dialysis Center	**Cortez**	842	0	0.0	Better	5	0.6	Same
Denver Dialysis Center	**Denver**	1041	3	0.3	Better	8	0.8	Same
Denver Women's Correctional Facility Dialysis Unit	**Denver**	277	0	0.0	Same	0	0.0	Same
Dialysis Clinic Inc Grand Junction	**Grand Junction**	183	1	0.5	Same	7	3.8	Worse
Dialysis Clinic Inc Montrose	**Montrose**	532	4	0.8	Same	13	2.4	Worse
Durango Dialysis Center	**Durango**	444	1	0.2	Same	1	0.2	Same
East Aurora Dialysis	**Aurora**	1629	8	0.5	Same	21	1.3	Worse
Englewood Dialysis Center	**Englewood**	705	3	0.4	Better	3	0.4	Same
FMC Canon City Dialysis	**Canon City**	454	5	1.1	Same	5	1.1	Same
FMC Denver Central Dialysis	**Denver**	1538	6	0.4	Better	25	1.6	Worse
FMC East Denver Dialysis	**Denver**	1359	6	0.4	Same	3	0.2	Same
FMC Fort Collins Dialysis	**Fort Collins**	1088	0	0.0	Better	18	1.7	Worse
FMC Greeley Dialysis Services	**Greeley**	1485	0	0.0	Better	0	0.0	Better

Dialysis-Related Infections (Access-Related Bacteremia: ARB and Local Access Infection: LAI) in Outpatient Dialysis Clinics. Reporting Period: March 1, 2010 - April 30, 2011.								
Dialysis Centers and Region		**Number of patients**	**ARB count**	**ARB rate**	**National comparison**	**LAI count**	**LAI rate**	**National comparison**
FMC La Junta Dialysis Services	**La Junta**	464	9	1.9	Same	13	2.8	Worse
FMC Dialysis Services of Lamar	**Lamar**	338	6	1.8	Same	11	3.3	Worse
FMC Loveland Dialysis	**Loveland**	818	13	1.6	Same	5	0.6	Same
FMC Pueblo Dialysis	**Pueblo**	1021	2	0.2	Better	22	2.2	Worse
FMC Dialysis Services of Pueblo South	**Pueblo**	1045	10	1.0	Same	18	1.7	Worse
FMC Dialysis Services of Pueblo West	**Pueblo**	95	0	0.0	Same	2	2.1	Same
FMC Rocky Mountain Dialysis	**Denver**	1320	12	0.9	Same	23	1.7	Worse
FMC Dialysis Services of Stapleton	**Denver**	572	5	0.9	Better	6	1.0	Same
FMC Walsenburg Dialysis	**Walsenburg**	207	1	0.5	Same	4	1.9	Same
Fountain Dialysis	**Fountain**	539	6	1.1	Same	3	0.6	Same
Grand Junction Dialysis Center	**Grand Junction**	1157	21	1.8	Worse	19	1.6	Worse
Kidney Center of Arvada LLC	**Arvada**	1085	9	0.8	Same	8	0.7	Same
Kidney Center of Lafayette	**Lafayette**	523	2	0.4	Same	3	0.6	Same
Kidney Center of Lakewood	**Lakewood**	893	3	0.3	Better	10	1.1	Same
Kidney Center of Longmont	**Longmont**	1043	7	0.7	Better	14	1.3	Same
Kidney Center of Westminster	**Westminster**	1477	10	0.7	Better	9	0.6	Better
Lakewood Crossing Dialysis Center	**Lakewood**	1351	11	0.8	Same	36	2.7	Worse
Lakewood Dialysis Center	**Lakewood**	1244	23	1.8	Worse	11	0.9	Worse
Liberty Dialysis Castle Rock LLC	**Castle Rock**	109	0	0.0	Same	0	0.0	Same
Liberty Dialysis Colorado Springs Central	**Colorado Springs**	723	2	0.3	Same	0	0.0	Better
Liberty Dialysis Colorado Springs North	**Colorado Springs**	513	4	0.8	Same	3	0.6	Same
Liberty Dialysis Colorado Springs South	**Colorado Springs**	657	11	1.7	Same	4	0.6	Same

Dialysis-Related Infections (Access-Related Bacteremia: ARB and Local Access Infection: LAI) in Outpatient Dialysis Clinics. Reporting Period: March 1, 2010 - April 30, 2011.								
Dialysis Centers and Region		**Number of patients**	**ARB count**	**ARB rate**	**National comparison**	**LAI count**	**LAI rate**	**National comparison**
Liberty Dialysis Pueblo LLC	**Pueblo**	591	2	0.3	Better	5	0.8	Same
Littleton Dialysis Center	**Littleton**	1051	1	0.1	Better	8	0.8	Same
Lonetree Dialysis Center	**Englewood**	671	8	1.2	Same	2	0.3	Same
Longmont Dialysis Center	**Longmont**	529	4	0.8	Same	7	1.3	Worse
Lowry Dialysis Center	**Denver**	1324	1	0.1	Better	15	1.1	Worse
Mesa County Dialysis	**Grand Junction**	189	3	1.6	Same	5	2.6	Worse
North Colorado Springs Dialysis	**Colorado Springs**	255	3	1.2	Same	2	0.8	Same
North Metro Dialysis Center	**Westminster**	439	1	0.2	Same	11	2.5	Worse
Parker Dialysis Center	**Parker**	303	0	0.0	Same	6	2.0	Worse
Pikes Peak Dialysis Center	**Colorado Springs**	1198	9	0.8	Same	11	0.9	Same
Printers Place Dialysis Center	**Colorado Springs**	335	0	0.0	Better	5	1.5	Same
Reliant Renal Care Colorado Springs	**Colorado Springs**	264	3	1.1	Same	0	0.0	Same
Reliant Renal Care Trinidad	**Trinidad**	222	2	0.9	Same	0	0.0	Same
South Denver Dialysis Center	**Denver**	895	1	0.1	Better	9	1.0	Same
Sterling Regional Medcenter-ESRD	**Sterling**	478	15	3.1	Same	2	0.4	Same
Thornton Dialysis Center	**Thornton**	1131	3	0.3	Better	0	0.0	Better
University of Colorado Hospital	**Aurora**	498	1	0.2	Same	1	0.2	Same
Westminster Dialysis Center	**Westminster**	926	4	0.4	Same	11	1.2	Worse

Facility DRI rates are per 100 patients.
National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2006.
See "Dialysis Surveillance Report: National Healthcare Safety Network (NHSN) - Data Summary for 2006", Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention.
*** Indicates value not shown due to suppression of infections data.
Infections data for dialysis centers with fewer than 50 patients in a twelve-month period are suppressed to protect confidential health information. These dialysis centers have met the reporting requirements.
Source: National Healthcare Safety Network (NHSN) Database.
Prepared By: Colorado Patient Safety Program, Colorado Department of Public Health and Environment.

Conclusions and Future Plans

Colorado mandated reporting of healthcare-associated infections in 2006. To date, four annual reports have been submitted to the legislature and public demonstrating a commitment by the Department and infection prevention professionals in healthcare facilities to track, monitor, and report infection data. Continuous attention is needed to ensure patient safety in our hospitals, ambulatory surgery centers, dialysis treatment clinics as well as other types of healthcare facilities such as long-term care. Any success to eliminate these serious infections will require continued effort from multiple stakeholders including patients and their families, care providers, administrators, and state health departments.

The U.S. Department of Health and Human Services (HHS) National Action Plan has stipulated a 50% reduction of CLABSI in intensive care units and inpatient wards by 2013.[17] HHS has also stipulated a 25% reduction in admission and readmission of surgical site infections by 2013.[17] Although Colorado CLABSI rates have declined (43%) and SSI rates remained stable, continued efforts are needed to ensure that these infections continue to decrease while ensuring patients do not suffer needlessly.

The Patient Safety Program (the Program) is committed to providing quality services through various methods to its stakeholders. First, healthcare-associated infection data will continue to be monitored, tracked, and reported in Semi-Annual bulletins and the State of Colorado Status Report on the Health Facility-Acquired Infections Disclosure Initiative.

Second, through American Recovery and Reinvestment Act (ARRA) funding, Program staff have been able to continue the important work of data quality assurance activities. Additional hiring of staff has allowed the Program to complete one validation study with central line-associated bloodstream infections. Individual facility reports were completed and sent to the infection prevention staff at each of the facilities to share with upper management staff. The Program began a second pilot study involving surgical site infections in hospitals and ambulatory surgery centers. It is anticipated that with future funding validation studies will continue and include dialysis-related infections as well as ongoing validation of all healthcare-associated infections. Refer to Appendix A for details on the validation studies.

Third, educational outreach programs for healthcare-associated infections and data analysis of these infections have been completed around the state with future classes planned in 2012. In collaboration with the U.S. Department of Health and Human Services (HHS) Region 8, a training of rural infection prevention staff in Regions 7 and 8 is slated for early 2012. The Program

recently completed a needs survey of both urban and rural infection prevention staff. A phone survey to the rural staff is scheduled to further determine what type of services the Program can provide to assist with infection prevention in the rural facilities.

Fourth, two collaboratives focusing on the reduction of surgical site infections and *Clostridium difficile* infections are in their final stages of completion. Please see Appendix C Prevention Collaboratives for specific findings, results, and lessons learned. A third collaborative focusing on the reduction of outpatient dialysis-related infections began in October, 2011, and will continue until July 31, 2012.

Fifth, communication venues for infection prevention staff have been developed. Two quarterly newsletters were distributed with positive feedback from recipients. Both semi-annual reports for 2011 were completed and are available on the Program's website. The Department's website is in the final stages of completion with ongoing updates to occur as needed.

Sixth, the Program staff will continue to collaborate with infection prevention staff, the Communicable Disease Epidemiology Program of the health department, as well as organizations outside the health department and within the state that share an interest in patient safety. These organizations include, but are not limited, to the following: Colorado Hospital Association, Colorado Foundation for Medical Care, Colorado Rural Health Center, Council of State and Territorial Epidemiologists, Denver Health, Intermountain End-Stage Renal Disease (ESRD) Network 15, and the U.S. Department of Health and Human Services (HHS) Region 8.

Additional funding for 2012 and beyond through grants is pending.

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Health Facility-Acquired Infections Report

Appendices

Appendix A: Data Validation Studies

As part of a comprehensive reform to address HAI, many states, including Colorado, have mandated reporting to create greater transparency between healthcare facilities and the public while supporting greater accountability. According to Lin[1], inter-facility comparisons of the data are only valid when the methods of surveillance are uniform and reliable across institutions. The Patient Safety Program (the Program) was charged with the responsibility for assuring quality and accuracy of data for central line-associated bloodstream infections (CLABSI) and surgical site infections through data validation. Validation of healthcare-associated infection (HAI) data is essential in order to verify correct understanding of definition criteria, surveillance practices, and reporting integrity. Inaccurate reporting of data by facilities can mislead the public and opportunities by the state health department or other credible validation entities to clarify and educate infection prevention personnel to reduce infections may be missed.

CLABSI Validation Study

The methodology used for CLABSI validation was derived from a similar study completed in Connecticut in 2009.[2] Thirty-five acute care hospitals and eight long-term acute care hospitals (LTACH) were included in the study. Between August 2010 and May 2011 two trained reviewers from the Patient Safety Program conducted interviews with infection preventionists (IP) and performed retrospective medical record reviews. The objectives of the study were to:

- Evaluate current surveillance methods used by IP to detect CLABSI.
- Assess completeness and accuracy of reporting CLABSI data (both infection and denominator) to NHSN and CDPHE.
- Where gaps exist, provide on-site education on the definitions, surveillance mechanisms and use of NHSN.

From a standardized questionnaire, information was collected to determine the methods IP use to gather CLABSI data; including the sources of data and specific processes for collecting it.

[1] Lin, et al. "Quality of Traditional Surveillance for Public Reporting of Nosocomial Bloodstream Infection Rates." JAMA (2010): 2035-2041.

[2] Backman LA, Melchreit R, and Rodriguez R. "Validation of the surveillance and reporting of central line-associated bloodstream infection data to a state health department." AJIC (2010): 832-838.

Medical records reviewed were randomly chosen from patients with positive blood cultures (an organism growing in the blood) who were receiving treatment in reporting adult critical care units (CCU), neonatal critical care units (NCCU) level II/III and III, and LTACH during the first quarter of 2010. There were a total of 648 patients, of which 527 (81%) were reviewed. From these, 37 (66.1%) patients were correctly identified as CLABSI cases and 19 (33.9%) were unreported CLABSI cases.

The Patient Safety Program provided onsite education of NHSN definitions to the IP when needed. The intent was to ensure CLABSI data is reported consistently for more accurate comparisons between facilities. For example, the Program ensured patient central lines were counted according to the NHSN definition. Or with respect to CLABSI, Program staff may have clarified parts of the infection definition that are frequently misunderstood.

While mandatory reporting of CLABSI has been required in Colorado since August 2007, this was the first effort to validate data. Areas where improvement was needed were (1) the interpretation of the surveillance definition of a CLABSI and (2) identification of where the infection should be attributed when a patient was transferred between facilities. Furthermore, it was identified that communication between facilities with regard to patients and infections was not sufficient. Communication of patient information is important to provide continuity of care for those patients transferred from one location to another. Following onsite and offsite education of infection preventionists during the past year, it is expected that reporting will improve. A follow up validation study for CLASBI has not been scheduled at this time. As mentioned earlier in this report, it is anticipated that with future funding, ongoing validation studies will occur.

Surgical Site Infection Validation Pilot Study

The CDPHE Patient Safety Program started a SSI validation project, involving 31 acute care hospitals and 10 ambulatory surgery centers (ASC).

The objectives of the validation of the SSI data are:

1. Determine the reliability and consistency of NHSN SSI surveillance definitions;
2. Evaluate adequacy of current surveillance methods used to detect infections;
3. Assess completeness and accuracy of reporting to the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN);
4. Provide on-site education on the definitions, surveillance mechanisms and use of NHSN where needed.

For the SSI validation study, herniorrhaphy procedures were selected for evaluation. This procedure was chosen because the procedure is performed at a large number of facilities, and there are a large number of procedures performed in both hospitals and ASC. Reported SSI for the period January 1, 2010 through June 30, 2010 were selected for review, along with an additional 366 herniorrhaphy procedures (5%) where no infection was reported. The case information was retrieved from the NHSN system for procedures performed in Colorado. As part of the study, an interview of infection control practitioners (IP) will be performed to determine surveillance methods used for SSI.

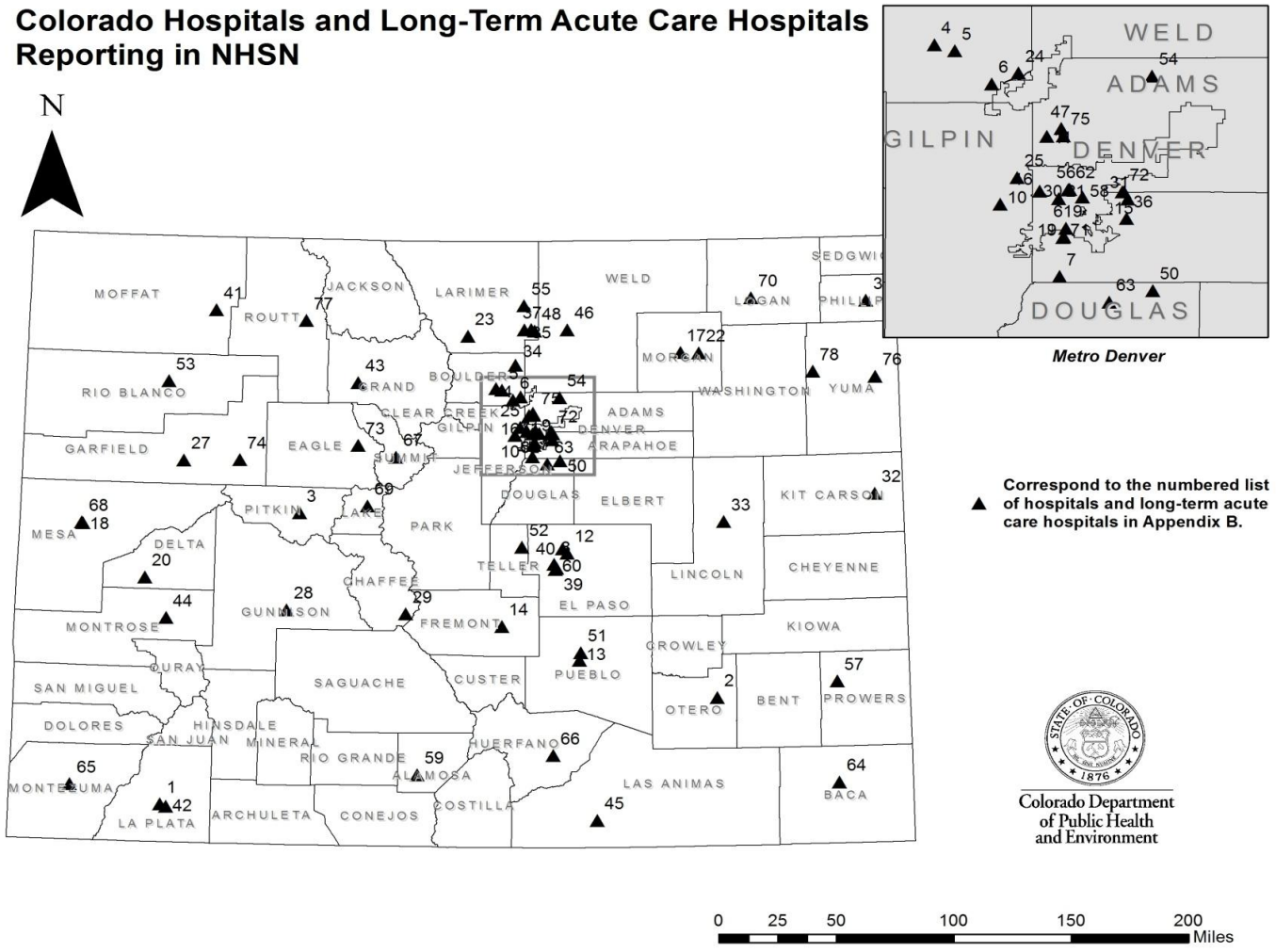
The study began in November, 2010, and involves two team members who schedule an on-site visit to review medical records and the surveillance process. Data retrieved from facilities for this project will be kept strictly confidential. It is anticipated that chart reviews with on-site visits will conclude by April or May, 2012.

As a primary goal of the study CDPHE Patient Safety Program staff will review and follow up with each hospital that has been identified as having reported data inaccuracies or data irregularities. Cases determined to have been reported but not meeting the NHSN criteria will also be reviewed and discussed with hospital infection prevention staff to correct any misinterpretation of criteria. The hospital will be asked to update the NHSN database to reflect the corrections.

Appendix B: Health Facilities Reporting

There are currently 259 hospitals, hospital units, ambulatory surgical centers and dialysis treatment clinics targeted for infection reporting. Of those, 69 hospitals (90%), 9 long-term acute care hospitals (100%), 38 ambulatory surgical centers (37.6%), and 61 dialysis treatment clinics (100%) report infection data. The reason some hospitals and ambulatory surgical centers do not report to the Department is those facilities do not have an adult critical care unit, neonatal critical care unit or they do not perform the reportable procedures.

The numbers on the maps are associated with the numbers in the hospital, ambulatory surgery center, and dialysis center lists, respectively. Health facilities reporting the data are listed alphabetically below with the procedures they currently perform and report. The first list includes hospitals and long-term acute care hospitals (pg 86 - 95). The second list includes ambulatory surgery centers (pg 96 - 99). The third list includes dialysis treatment centers (pg 100 - 103).


Colorado Hospitals and Long-Term Acute Care Hospitals Reporting in NHSN
N
WELD
ADAMS
GILPIN
DENVER
DOUGLAS
Metro Denver
MOFFAT
ROUTT
JACKSON
LARIMER
WELD
LOGAN
SEDGWICK
PHILLIPS
MORGAN
WASHINGTON
YUMA
RIO BLANCO
GARFIELD
EAGLE
GRAND
BOULDER
CLEAR CREEK
GILPIN
SUMMIT
JEFFERSON
ADAMS
DENVER
ARAPAHOE
DOUGLAS
ELBERT
KIT CARSON
CHEYENNE
LINCOLN
PITKIN
LAKE
PARK
TELLER
MESA
DELTA
CHAFFEE
GUNNISON
EL PASO
FREMONT
MONTROSE
CROWLEY
KIOWA
OURAY
SAN MIGUEL
SAGUACHE
CUSTER
PUEBLO
OTERO
BENT
PROWERS
DOLORES
HINSDALE
SAN JUAN
MINERAL
RIO GRANDE
HUERFANO
ALAMOSA
LAS ANIMAS
MONTEZUMA
LA PLATA
ARCHULETA
CONEJOS
COSTILLA
BACA
Correspond to the numbered list of hospitals and long-term acute care hospitals in Appendix B.
Colorado Department of Public Health and Environment
0 25 50 100 150 200
Miles

Hospitals and Long-Term Acute Care Hospitals

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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

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

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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

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

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
- Herniorrhaphy
- Abdominal Hysterectomy
- Vaginal Hysterectomy

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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

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
Abdominal Hysterectomy
Vaginal Hysterectomy

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
Abdominal Hysterectomy
Vaginal Hysterectomy

10 Centura Health-St Anthony Hospital
11600 W. 2nd Place
Lakewood, CO 80228
720-321-0000
www.stanthonyhosp.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Coronary Artery Bypass Grafts
Central Lines
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

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
Abdominal Hysterectomy
Vaginal Hysterectomy

12 Centura Health-St Francis Medical Center
6001 E Woodmen Road
Colorado Springs, CO 80923
www.centura.org
Performing and Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Central Lines
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

13 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
Abdominal Hysterectomy
Vaginal Hysterectomy

14 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
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

15 Children's Hospital Colorado
13123 East 16th Avenue
Aurora, CO 80045
www.thechildrenshospital.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Central Lines
Herniorrhaphy

16 Colorado Acute Long-term Hospital
1601 North Lowell Blvd.
Denver, Colorado 80204
http://www.lifecare-hospitals.com
Performing and Reporting:
Central lines (permanent and temporary)

17 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
Abdominal Hysterectomy
Vaginal Hysterectomy

18 Community Hospital
2021 N 12th St
Grand Junction, CO 81501
www.gjhosp.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Central Lines
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

19 Craig Hospital
3425 S Clarkson Street
Englewood, CO 80113
www.craighospital.org
Performing and Reporting:
Central lines (permanent and temporary)

20 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
Abdominal Hysterectomy
Vaginal Hysterectomy

21 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
Abdominal Hysterectomy
Vaginal Hysterectomy

22 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

23 Estes Park Medical Center
555 Prospect Ave.
Estes Park, CO 80517
www.epmedcenter.com
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

24 Exempla Good Samaritan Medical Center
200 Exempla Circle
Lafayette, CO 80026
www.exempla.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Central Lines
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

25 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
Abdominal Hysterectomy
Vaginal Hysterectomy

26 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

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

28 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
- Herniorrhaphy
- Abdominal Hysterectomy
- Vaginal Hysterectomy

29 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

30 Kindred Hospital-Denver
1920 High St.
Denver, CO 80218
www.kindredhealthcare.com
Performing and Reporting:
- Central lines (permanent and temporary)

31 Kindred Hospital-Aurora
700 Potomac St. 2nd Floor
Aurora, CO 80011
www.kindredhealthcare.com
Performing and Reporting:
- Central lines (permanent and temporary)

32 Kit Carson Memorial Hospital
286 16th St.
Burlington, CO 80807
www.kccmh.org
Performing and reporting:
- Herniorrhaphy

33 Lincoln Community Hospital
111 6th St.
Hugo, CO 80821
lincolncommunityhospitalandnursinghome.com
Performing and Reporting:
- Herniorrhaphy

34 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

35 McKee Medical Center
2000 Boise Ave
Loveland, CO 80539
www.bannerhealth.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy
- Abdominal Hysterectomy
- Vaginal Hysterectomy

36 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

37 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

38 Melissa Memorial Hospital
1001 Ea Johnson St.
Holyoke, CO 80734
http://www.melissamemorial.org
Performing and Reporting:
- Herniorrhaphy
- Abdominal Hysterectomy
- Vaginal Hysterectomy

39 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

40 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

41 The Memorial Hospital
750 Hospital Loop
Craig, CO 81625
www.thememorialhospital.com
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Herniorrhaphy
- Abdominal Hysterectomy
- Vaginal Hysterectomy

42 Mercy Regional Medical Center
1010 Three Springs Blvd
Durango, CO 81301
www.mercydurango.org
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Central Lines
- Herniorrhaphy
- Abdominal Hysterectomy
- Vaginal Hysterectomy

43 Middle Park Medical Center
214 S. 4th Street
Kremmling, CO 80459
http://www.mpmc.org/
Performing & Reporting:
- Total/Partial Hip Replacement
- Total/Partial Knee Replacement
- Herniorrhaphy

44 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

45 Mount San Rafael Hospital
410 Benedicta Ave
Trinidad, CO 81082
http://www.msrhc.org/
Performing & Reporting:
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

46 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
Abdominal Hysterectomy
Vaginal Hysterectomy

47 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
Abdominal Hysterectomy
Vaginal Hysterectomy

48 Northern Colorado Long-term Acute Hospital
4401A Union S.
Johnstown, CO 80534
http://ncltah.ernesthealth.com
Performing and Reporting:
Central lines (permanent and temporary)

49 OrthoColorado Hospital at St. Anthony Medical Campus
11650 W. 2nd Place
Lakewood, CO 80228
http://www.orthocolorado.org/
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement

50 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
Abdominal Hysterectomy
Vaginal Hysterectomy

51 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
Abdominal Hysterectomy
Vaginal Hysterectomy

52 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

53 Pioneers Medical Center
345 Cleveland St.
Meeker, CO 81641
http://www.pioneershospital.org
Performing and Reporting:
Herniorrhaphy

54 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

55 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

56 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

57 Prowers Medical Center
401 Kendall Drive
Lamar, CO 81052
www.lmpc.org
Performing and Reporting:
- Herniorrhaphy
- Abdominal Hysterectomy
- Vaginal Hysterectomy

58 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

59 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
- Central Lines
- Herniorrhaphy
- Abdominal Hysterectomy
- Vaginal Hysterectomy

60 Select Long-term Care Hospital-Colorado Springs
825 Pikes Peak Ave. Suite 500
Colorado Springs, CO 80903
www.selectmedicalcorp.com
Performing and Reporting:
- Central lines (permanent and temporary)

61 Select Specialty Hospital-Denver South
2525 South Downing RD 3rd Floor
Denver, CO 80210
www.selectmedicalcorp.com
Performing and Reporting:
- Central lines (permanent and temporary)

62 Select Specialty Hospital
1719 East 19th Ave 5B
Denver, CO 80218
www.selectmedicalcorp.com
Performing and Reporting:
- Central line (permanent and temporary)

63 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
- Abdominal Hysterectomy
- Vaginal Hysterectomy

64 Southeast Colorado Hospital
373 East Tenth Ave.
Springfield, CO 81073
http://www.sechosp.org/
Performing and Reporting:
Herniorrhaphy

65 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
Abdominal Hysterectomy
Vaginal Hysterectomy

66 Spanish Peaks Regional Health Center
23500 US HWY 160
Walsenburg, CO 81089
http://www.sprhc.org
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

67 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
Abdominal Hysterectomy
Vaginal Hysterectomy

68 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
Abdominal Hysterectomy
Vaginal Hysterectomy

69 St. Vincent General Hospital District
822 W 4th Street
Leadville, CO 80461
http://www.svghd.org
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

70 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
Abdominal Hysterectomy
Vaginal Hysterectomy

71 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
Abdominal Hysterectomy
Vaginal Hysterectomy

72 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
Abdominal Hysterectomy
Vaginal Hysterectomy

73 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
Abdominal Hysterectomy

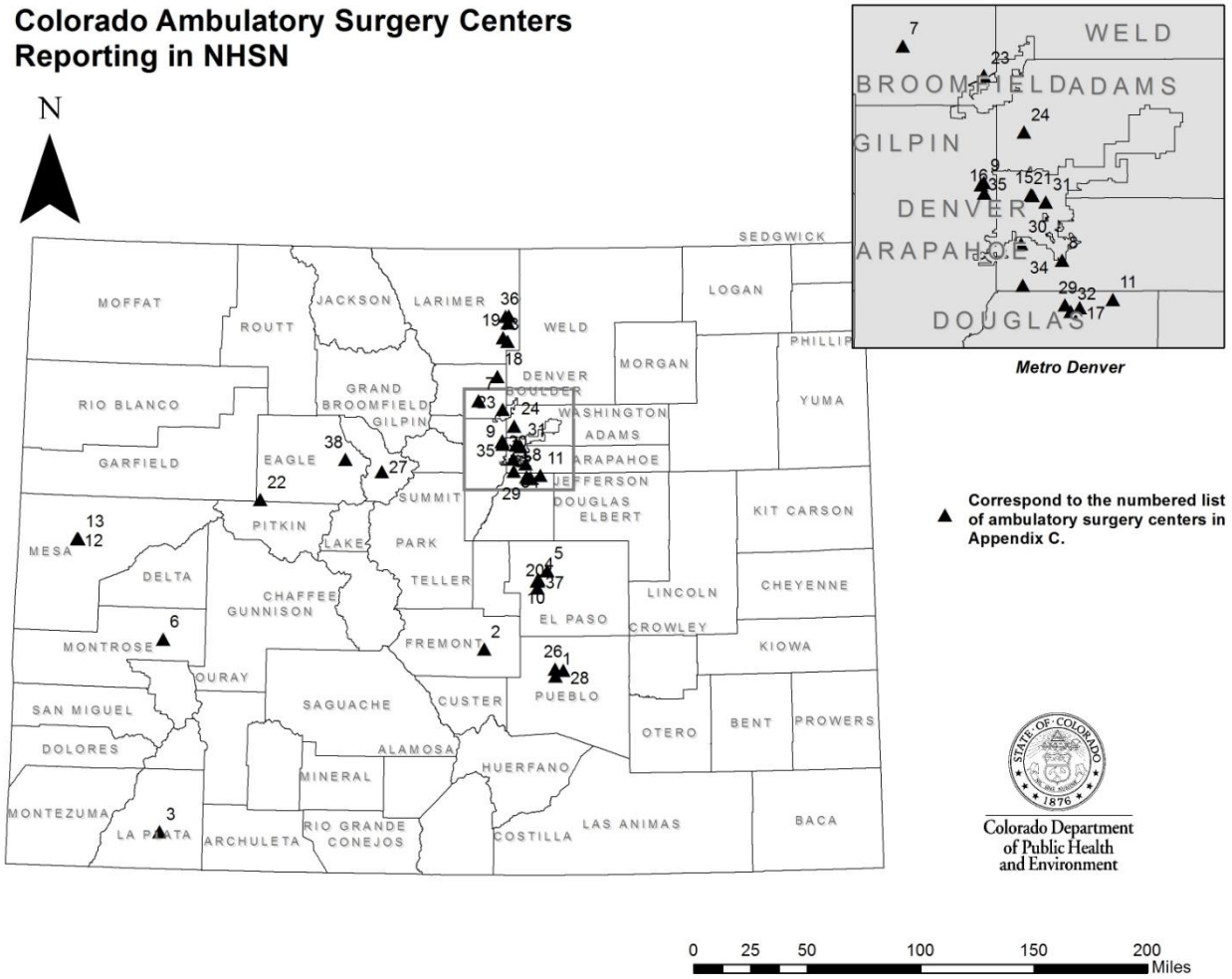
74 Valley View Hospital Association
1906 Blake Ave
Glenwood Springs, CO 81601
www.vvh.org
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Central Lines
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

75 Vibra Long-term Acute Care Hospital
8451 Pearl St.
Thornton, CO 80229
www.vibrahealthcare.com
Performing and Reporting:
Central lines (permanent and temporary)

76 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
Abdominal Hysterectomy
Vaginal Hysterectomy

77 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
Abdominal Hysterectomy
Vaginal Hysterectomy

78 Yuma District Hospital
1000 West 8th Ave.
Yuma, CO 80759
http://www.yumahospital.org
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy


Colorado Ambulatory Surgery Centers
Reporting in NHSN
N
SEDGWICK
MOFFAT
ROUTT
JACKSON
LARIMER
WELD
LOGAN
PHILLIP
MORGAN
YUMA
RIO BLANCO
GRAND
BROOMFIELD
GILPIN
DENVER
BOULDER
WASHINGTON
ADAMS
ARAPAHOE
JEFFERSON
DOUGLAS
ELBERT
GARFIELD
EAGLE
SUMMIT
PITKIN
LAKE
PARK
KIT CARSON
MESA
DELTA
TELLER
CHAFFEE
GUNNISON
LINCOLN
CHEYENNE
EL PASO
CROWLEY
MONTROSE
FREMONT
KIOWA
OURAY
SAGUACHE
CUSTER
PUEBLO
SAN MIGUEL
OTERO
BENT
PROWERS
DOLORES
ALAMOSA
HUERFANO
MINERAL
MONTEZUMA
LA PLATA
ARCHULETA
RIO GRANDE
CONEJOS
COSTILLA
LAS ANIMAS
BACA
WELD
BROOMFIELD
ADAMS
GILPIN
DENVER
ARAPAHOE
DOUGLAS
Metro Denver
Correspond to the numbered list of ambulatory surgery centers in Appendix C.
Colorado Department of Public Health and Environment
0 25 50 100 150 200
Miles

Ambulatory Surgery Centers

1 Aberdeen Ambulatory Surgical Center, LLC
650 Dittmer Ave.
Pueblo, CO 81005
Performing and Reporting:
Herniorrhaphy

2 Arkansas Valley Surgery Center
933 Sells Ave
Canon City, CO 81212
Arkansasvalleysurgerycenter.com
Performing and Reporting:
Herniorrhaphy

3 ASC Durango at Mercy Regional Med Ctr.
1 Mercado Street Suite 210
Durango, CO 81301
www.ascdurango.org
Performing and Reporting:
Herniorrhaphy

4 Audubon Ambulatory Surgery Center
3030 N. Circle Drive
Colorado Springs, CO 80909
www.audubonsurgerycenter.com
Performing and Reporting:
Herniorrhaphy
Vaginal Hysterectomy

5 Audubon ASC at St. Francis
6011 E Woodmen Road Suite 200
Colorado Springs, CO 80923
www.audubonsurgerycenter.com
Performing and Reporting:
Herniorrhaphy

6 Black Canyon Surgical Center, LLC
611 East Star Court Suite C
Montrose, CO 81401
www.blackcanyonsurgicalcenter.com
Performing and Reporting:
Herniorrhaphy

7 Boulder Medical Center, PC
2750 Broadway
Boulder, CO 80304
www.bouldermedicalcenter.com
Performing and Reporting:
Herniorrhaphy

8 Centrum Surgery Center, LTD
8200 E. Belleview Suite 300 E
Greenwood Village, CO 80111
www.centrumsurgicalcenter.com
Performing and Reporting:
Herniorrhaphy

9 Clear Creek Surgery Center, LLC
7809 West 38th Ave.
Wheat Ridge, CO 80033
clearcreeksurgery.com
Performing and Reporting:
Herniorrhaphy

10 Colorado Springs Surgery Center-ASC
1615 Medical Center Point
Colorado Springs, CO 80907
www.coloradospringssurgerycenter.com
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy

11 Crown Point Surgery Center-ASC
9397 Crown Crest Blvd. #110
Parker, CO 80138
Performing and Reporting:
Herniorrhaphy

12 First Choice Outpatient Surgery Center at Community Hospital
2596 F Road
Grand Junction, CO 81505
yourcommunityhospital.com/outpatient surgery.cfm
Performing and Reporting:
Herniorrhaphy
Vaginal Hysterectomy

13 Grand Valley Surgical Center, LLC
710 Wellington Ave. Suite 21
Grand Junction, CO 81501
www.grnadvalleysurgicalcenter.com
Performing and Reporting:
Herniorrhaphy

14 Harmony Surgery Center, LLC
2127 E Harmony Rd. Suite 200
Fort Collins, CO 80528
www.harmonyasc.com
Performing and Reporting:
Herniorrhaphy

15 Kaiser Permanente Ambulatory Surgery Center
2045 Franklin Street
Denver, CO 80205
www.kaiserpermanente.org
Performing and Reporting:
Herniorrhaphy

16 Lakewood Surgery Center
2201 Wadsworth Blvd.
Lakewood, CO 80214
www.lakewoodsurgicalcenter.com
Performing and Reporting:
Herniorrhaphy

17 Lincoln Surgery Center, LLC
11960 E Lioness Way #120
Parker, CO 80134
www.lincolnsurgerycenter.com
Performing and Reporting:
Herniorrhaphy

18 Longmont Surgery Center, LLC
2030 W Mountain View Ave #100
Longmont, CO 80501
Longmontsurgerycenter.com
Performing and Reporting:
Herniorrhaphy

19 Loveland Surgery Center, ASC
3800 N Grant Ave.
Loveland, CO 80538
www.lovelandsurgerycenter.com
Performing and Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement

20 Memorial Health System Outpatient Surgery Center at Printers Park, ASC
http://www.memorialhealthsystem.com/
175 S Union Blvd Suite 100
Colorado Springs, CO 80910
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

21 Midtown Surgery Center-LTD
1919 East 18th Ave
Denver, CO 80206
www.midtownsurgicalcenter.com
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy

22 Midvalley Ambulatory Surgery Center, LLC
1450 E Valley Rd 202
Basalt, CO 81621
Performing and Reporting:
Herniorrhaphy

23 Minimally Invasive Spine Institute
300 Exempla Circle #130
Lafayette, CO 80026
www.coloradospineinstitute.com
Performing and Reporting:
Herniorrhaphy

24 North Suburban Surgery Center
9195 Grant Street Suite 200
Thornton, CO 80229
www.northsuburbansurgery.com
Performing and Reporting:
Herniorrhaphy

25 Orthopaedic Center of the Rockies, ASC
2500 E Prospect Road
Fort Collins, CO 80525
www.orthohealth.com
Performing and Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement

26 Parkwest Surgery Center, LLC
3676 Parker Blvd Suite 140
Pueblo, CO 81008
Performing and Reporting:
Herniorrhaphy

27 Peak One Surgery Center
350 Peak One Drive
Frisco, CO 80443
www.peak1asc.com
Performing and Reporting:
Herniorrhaphy

28 Pueblo Surgery Center
25 Montebello Road
Pueblo, CO 81001
www.pueblosurgery.com
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

29 Renewal Surgery Center
9777 S Yosemite Street Suite 210
Lone Tree, CO 80124
Performing and Reporting:
Herniorrhaphy

30 Rocky Mountain Surgery Center, LLC
401 West Hampden Place Suite 100
Englewood, CO 80110
Rockymountainsurgery.com
Performing and Reporting:
Herniorrhaphy
Total/Partial Knee Replacement

32 Sky Ridge Surgical Center
10099 Ridge Gate Parkway Suite 100
Lone Tree, CO 80124
Skyridgesurgicalcenter.com
Performing and Reporting:
Herniorrhaphy

33 Skyline Surgery Center
2555 East 13th Street Suite 200
Loveland, CO 80537
www.bannerhealth.com
Performing and Reporting:
Herniorrhaphy
Total/Partial Knee Replacement
Abdominal Hysterectomy
Vaginal Hysterectomy

34 Summit View Surgery Center, LLC
7730 S Broadway
Littleton, CO 80122
Performing and Reporting:
Herniorrhaphy

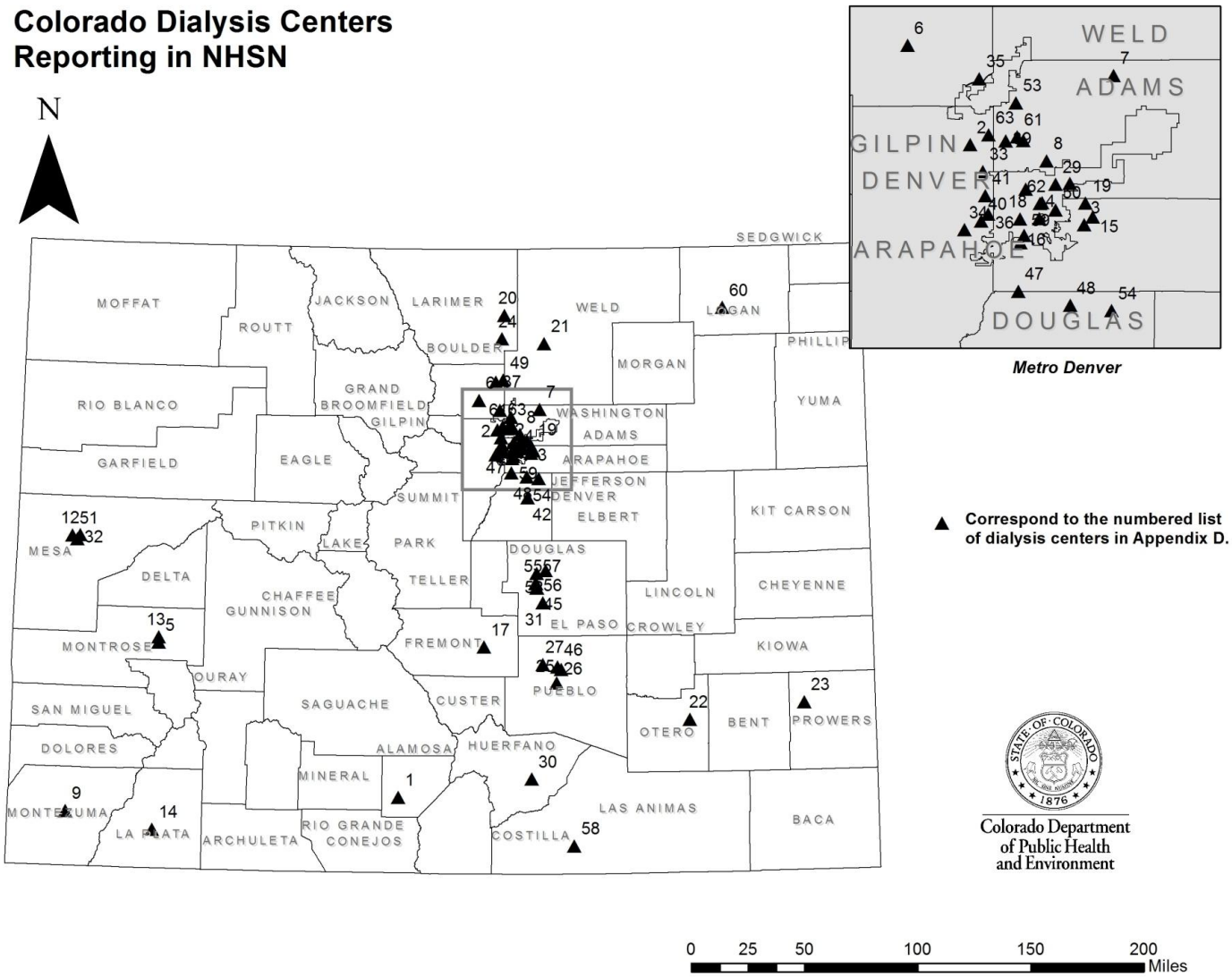
35 Surgery Center at Lutheran
3455 Lutheran Parkway Suite 150
Wheat Ridge, CO 80033
www.exempla.org
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

31 Rose Surgical Center
4700 East Hale Parkway #200
Denver, CO 80220
Rosesurgicalcenter.com
Performing and Reporting:
Herniorrhaphy

36 Surgery Center of Fort Collins
1100 East Prospect Road
Fort Collins, CO 80525
Performing and Reporting:
Herniorrhaphy
Abdominal Hysterectomy
Vaginal Hysterectomy

37 Surgical Center at Premier
3920 N Union Blvd Suite 240
Colorado Springs, CO 80907
www.scpremier,net
Performing & Reporting:
Total/Partial Hip Replacement
Total/Partial Knee Replacement
Herniorrhaphy

38 Vail Valley Surgery Center, LLC
181 W Meadows Drive Suite 3R
Vail, CO 81657
www.vvmc.com
Performing and Reporting:
Herniorrhaphy
Vaginal hysterectomy


Colorado Dialysis Centers
Reporting in NHSN
N
WELD
ADAMS
GILPIN
DENVER
ARAPAHOE
DOUGLAS
Metro Denver
SEDGWICK
MOFFAT
ROUTT
JACKSON
LARIMER
WELD
LOGAN
PHILLIP
BOULDER
MORGAN
YUMA
RIO BLANCO
GRAND
BROOMFIELD
GILPIN
WASHINGTON
ADAMS
GARFIELD
EAGLE
ARAPAHOE
JEFFERSON
SUMMIT
DENVER
ELBERT
KIT CARSON
PITKIN
LAKE
PARK
DOUGLAS
MESA
DELTA
TELLER
CHEYENNE
CHAFFEE
GUNNISON
LINCOLN
EL PASO
CROWLEY
MONTROSE
FREMONT
KIOWA
OURAY
PUEBLO
SAN MIGUEL
SAGUACHE
CUSTER
BENT
PROWERS
OTERO
DOLORES
ALAMOSA
HUERFANO
MINERAL
LAS ANIMAS
MONTEZUMA
LA PLATA
ARCHULETA
RIO GRANDE
CONEJOS
COSTILLA
BACA
Correspond to the numbered list of dialysis centers in Appendix D.
Colorado Department of Public Health and Environment
0 25 50 100 150 200
Miles

Outpatient Dialysis Clinics

1 Alamosa Dialysis
612 Del Sol Drive
Alamosa, CO 81101

2 Arvada Dialysis Center
9950 W 80th Ave Suite 25
Arvada, CO 80005

3 Aurora Dialysis Center
1411 S Potomac #100
Aurora, CO 80012

4 Belcaro Dialysis Center
755 S Colorado Blvd
Denver, CO 80246

5 Black Canyon Dialysis Center
3241 Rio Grande Ave. Unit D
Montrose, CO 81401

6 Boulder Dialysis Center
2880 Folsom Dr. #110
Boulder, CO 80304

7 Brighton Dialysis Center
4700 E. Bromley Lane Suite #103
Brighton, CO 80601

8 Commerce City Dialysis
6320 Holly St.
Commerce City, CO 80022

9 Cortez Dialysis Center
601 E Main St. Suite C
Cortez, CO 81321

10 Denver Dialysis Center
2900 Downing Unit C
Denver, CO 80205

11 Denver Women's Reception/Diagnostic Center
10900 Smith Road
Denver, CO 80239

12 Dialysis Clinic Inc. Grand Junction
2748 Crossroads Blvd.
Grand Junction, CO 81506

13 Dialysis Clinic Inc. Montrose
945 S. 4th St.
Montrose, CO 81401

14 Durango Dialysis Center
72 Suttle St. Unit D
Durango, CO 81303

15 East Aurora Dialysis
482 S. Chambers Rd.
Aurora, CO 80017

16 Englewood Dialysis Center
3247 S. Lincoln St.
Englewood, CO 80113

17 Fresenius Canon City Dialysis
2245 Fremont Dr.
Canon City, CO 81212

18 Fresenius Denver Central Dialysis
765 South Broadway
Denver, CO 80209

19 Fresenius East Denver Dialysis
962 Potomac Circle
Aurora, CO 80011

20 Fresenius Fort Collins Dialysis
1213 Riverside Dr.
Fort Collins, CO 80524

21 Fresenius Greeley Dialysis
2343 W 27th St. #503
Greeley, CO 80634

22 Fresenius La Junta Dialysis
1116 Carson Ave.
La Junta, CO 81050

23 Fresenius Lamar Dialysis Services
108 W. Lee Ave.
Lamar, CO 80209

24 Fresenius Loveland Dialysis
2940 Ginnala Dr.
Loveland, CO 80538

25 Fresenius Pueblo Dialysis
41 Montbello Rd. Suite #200
Pueblo, CO 81004

26 Fresenius Pueblo South Dialysis
3426 Lake Ave. Suite #110
Pueblo, CO 81004

27 Fresenius Pueblo West Dialysis
73 North Aspen Ski Way
Pueblo, CO 81007

28 Fresenius Rocky Mountain Dialysis
4600 Hale Parkway #120
Denver, CO 80220

29 Fresenius Stapleton Dialysis*
7606 E. 36th Ave.
Denver, CO 80238

30 Fresenius Walsenburg Dialysis
23450 US Highway 160
Walsenburg, CO 81089

31 Fountain Dialysis
6910 Bandley Dr.
Fountain, CO 80817

32 Grand Junction Dialysis Center
710 Wellington Ave. Suite #20
Grand Junction, CO 81501

33 Kidney Center of Arvada
5265 Vance St.
Arvada, CO 80002

34 Kidney Center of Bear Creek
11058 West Jewel Ave
Lakewood, CO 80227

35 Kidney Center of Lafayette
2655 Crescent Dr. Suite C
Lafayette, CO 80026

36 Kidney Center of Lakewood
6166 W. Alameda Ave.
Denver, CO 80266

37 Kidney Center of Longmont
1960 Ken Pratt Blvd. Suite A
Longmont, CO 80501

38 Kidney Center of Thornton*
8451 Pearl St.
Thornton, CO 80229

39 Kidney Center of Westminster
8410 Decatur St.
Westminster, CO 80031

40 Lakewood Crossing Dialysis Center
1057 S Wadsworth Suite #100
Lakewood, CO 80226

41 Lakewood Dialysis Center
1750 Pierce St. Suite B
Lakewood, CO 80214

42 Liberty Dialysis Castle Rock LLC
4352 Trail Boss Drive
Castle Rock, CO 80104

43 Liberty Dialysis Colorado Springs Central
1910 Lelaray St.
Colorado Springs, CO 80909

44 Liberty Dialysis Colorado Springs North
2180 Hollowbrook Drive
Colorado Springs, CO 80918

45 Liberty Dialysis Colorado Springs South
2508 Airport Road
Colorado Springs, CO 80910

46 Liberty Dialysis Pueblo
850 Eagle Ridge Blvd.
Pueblo, CO 81008

47 Littleton Dialysis Center
209 W County Line Rd.
Littleton, CO 80126

48 Lonetree Dialysis Center
9777 Pyramid Court Suite #140
Englewood, CO 80112

49 Longmont Dialysis Center
1715 Iron Horse Dr. Suite #170
Longmont, CO 80501

50 Lowry Dialysis Center
7465 E 1st Ave. #A
Denver, CO 80230

51 Mesa County Dialysis
561 25 Road Suite D
Grand Junction, CO 81505

52 North Colorado Springs Dialysis
6071 E Woodmen Rd. Suite #100
Colorado Springs, CO 80923

53 North Metro Dialysis Center
12365 Huron Suite #500
Westminster, CO 80234

54 Parker Dialysis Center
10371 S Parkglenn Way Suite #180
Parker, CO 80138

55 Pikes Peak Dialysis Center
2002 Lelaray St. Suite #130
Colorado Springs, CO 80909

56 Printers Place Dialysis Center
2802 International Circle
Colorado Springs, CO 80910

57 Reliant Renal Care Colorado Springs
1605 N Union Blvd. Suite #100
Colorado Springs, CO 80909

58 Reliant Renal Care Trinidad
400 Benedicta Suite C
Trinidad, CO 81082

59 South Denver Dialysis Center
850 East Harvard Suite #60
Denver, CO 80210

60 Sterling Regional Medical Center-ESRD
603 Holly Dr.
Sterling, CO 80751

61 Thornton Dialysis Center
8800 Fox Dr.
Thornton, CO 80260

62 University of Colorado Dialysis Services
4185 E 9th Ave
Denver, CO 80262

63 Westminster Dialysis Center
9035 Harlan St. #90
Westminster, CO 80031

*Will begin reporting in 8/2011

Appendix C: CDPHE Infection Prevention Collaboratives

SSI and *C. difficile* Infection Prevention Collaboratives

Colorado established two new ARRA funded HAI prevention collaboratives; one targeting Surgical Site Infections (SSI) and the other targeting *Clostridium difficile* infections (CDI). The Colorado Department of Public Health (CDPHE) Patient Safety Program has partnered with the Colorado Hospital Association (CHA) and Dr. Connie Price, from Denver Health and Hospitals, to implement the collaborative.

The purpose of the collaborative is to enlist facilities to work together to reduce health facility-acquired infections through data sharing and collaborative learning. Participants are expected to enter SSI and CDI-related outcome data into NHSN and data for various process measures (i.e., hand hygiene, appropriate hair removal, environmental cleaning, etc.) into the CHA website (explained below).

The SSI Collaborative's goals are to reduce the SSI standardized infection ratio (SIR) by at least 15% from baseline or to zero. The CDI collaborative goal is to reduce the facility-wide healthcare facility-onset CDI event rates by at least 15% from baseline or to zero. Twenty facilities for each collaborative were targeted for enrollment and 20 had enrolled in each; however, some facilities dropped out due to reported workload burden. At the end of the collaborative period, 19 and 17 facilities have remained in the SSI and CDI collaboratives, respectively.

CHA contracted with an experienced infection preventionist, Amber Miller from Denver Health and Hospitals, to conduct annual comprehensive training courses that covered infection prevention, basic epidemiology, and NHSN reporting. Tamara Hoxworth, a Quality Improvement Specialist from CDPHE's Patient Safety Program, served as the liaison between CHA and CDPHE, provided NHSN technical assistance to collaborative participants, presented CDPHE- and NHSN-specific information at collaborative sessions, and generated facility-specific feedback reports for participants.

CHA developed a secure website for participating facilities to use to submit monthly process measure data and to blog with other collaborative members on prevention problems, approaches, and successes. The website was the primary vehicle for sharing

information among participating facilities during the project, including HAI data. A webinar or conference call was held monthly with collaborative participants to discuss reporting and prevention issues and host presentations by expert speakers on relevant topics.

Facility specific data, which enabled facilities to compare their own infection rates and process measures to other facilities in the collaborative, as well as to national and state averages, were presented at learning sessions in October 2010 and June 2011. In addition, individual feedback reports were provided to facilities in August 2010 depicting the first quarter of data (April – June 2010) and again in June 2011 depicting the first year of data (April 2010 – March 2011). A final webinar is scheduled for January 17, where data for the entire collaborative period will be presented, along with results of a phone survey of collaborative members which attained feedback on strengths, weaknesses and suggested improvements for future collaboratives.

Colorado Dialysis Infection Prevention Collaborative

CDPHE's Patient Safety Program recently received federal funds (Affordable Care Act) from the Centers for Disease Control and Prevention (CDC) to implement an infection prevention collaborative with dialysis facilities. Colorado was the 1st state in the nation to publicly report dialysis related infections and is now be the 1st state to start a Dialysis Infection Prevention Collaborative. CDPHE is partnering with the Intermountain End Stage Renal Disease Network to implement this collaborative, which has the goal of facilitating learning and sharing information, ideas and data to reduce dialysis related infections and spur a broader interest in preventing infections among the dialysis community.

Prevention Collaborative members are representatives from outpatient dialysis facilities across Colorado who have pledged to work together through July 31, 2012. In doing so, participants will implement an intervention of their choice to improve hand hygiene, conduct observations of hand-hygiene opportunities, and assess and report compliance with CDC-recommended practices to track improvement in proper hand hygiene.

In addition to sharing best practices, Collaborative members will have the opportunity to:

- Network with other members through in-person meetings and conference calls to discuss infection prevention strategies and related topics.
- Get input on challenges to preventing infections from dialysis facility staff and BSI prevention experts.
- Receive free infection prevention education from dialysis and BSI prevention experts.

- Receive free education and support for NHSN use, infection measurement and data analysis.
- Describe Collaborative efforts at regional and national meetings and serve as role models for others.
- Develop tools and resources that may assist in the national infection prevention movement.
- Receive formal recognition for partnering with CDC and others in protecting dialysis patients.
- Receive assistance with press releases about efforts to protect dialysis patients and improve patient care.
- Experience pride in being an integral partner with CDC, CDPHE, and the Intermountain ESRD Network to reduce dialysis related infections and improve patient care.

Twenty-eight facilities have signed up to participate in the collaborative. An introductory conference call was held November 3, 2011 to discuss expectations, schedule, and next steps, and a kick-off meeting was held November 17, 2011. The kick-off meeting hosted presentations by national experts, Matt Arduino, M.S., Dr.P.H. and Sally Hess, M.P.H. who spoke, respectively, about dialysis infection microbiology and prevention, and lessons learned in a dialysis collaborative experience.

Appendix D: Consumer Resources

Hospital and Surgical Patients

Every day patients receiving medical treatment acquire infections in healthcare facilities. Spending time in a hospital or getting surgery puts patients at risk for healthcare-associated infections (HAI), such as blood, surgical site, or urinary tract infections. These infections can have devastating physical, emotional and financial results. However, there are actions that healthcare consumers and providers can take to reduce HAI. The following ten steps, published by the Centers for Disease Control and Prevention[3], are simple activities that patients and their healthcare providers can follow to reduce the likelihood of acquiring HAI and improve healthcare safety in general:

1. Speak up: Tell your doctor about any worries you have about your safety and ask them what they are doing to protect you.
2. Keep hands clean: If you do not see your providers clean their hands, ask them to do so. Also, remind your loved ones and visitors. Washing hands can prevent the spread of germs.
3. Ask if you still need a central line or urinary catheter: A central line catheter is a tube inserted into a central vein for giving fluids and medicines and for obtaining diagnostic information to assess your condition and guide your treatment. A urinary catheter is a tube placed in the urethra to drain urine from the bladder into an attached bag or container. Leaving any catheter in place too long increases the chances of getting an infection.
4. Ask your healthcare provider: "will there be a new needle, new syringe, and a new vial for this procedure or injection?" Healthcare providers should never reuse needles or syringes.
5. Be careful with medications: Avoid taking too much medicine by following package directions. Also, to avoid harmful drug interactions, tell your doctor about all medicines you are taking.
6. Get smart about antibiotics: Help prevent antibiotic resistance by taking all your antibiotics as prescribed, and not sharing your antibiotics with other people. Remember that antibiotics don't work against viruses like the ones that cause the common cold.
7. Watch out for *Clostridium difficile: C. difficile* is a bacterium that can cause severe. Tell your doctor if you have severe diarrhea, especially if you are also taking an antibiotic.

[3] Patient Safety: Ten Things You Can Do to Be a Safe Patient. <http://www.cdc.gov/HAI/patientSafety/patient-safety.html>.

8. Know the signs and symptoms of infection: Some skin infections, like Methicillin-resistant *Staphylococcus aureus* (MRSA), appear as redness, pain, or drainage at an intravenous catheter site or surgical incision site. A fever may or may not be present. Tell your doctor if you have these symptoms.
9. Get your flu shot: Protect yourself against the flu and other complications by getting vaccinated.
10. Prepare for surgery: Ask your doctor what you should do to prepare for surgery and tell him/her about any medical conditions you have. The following list, published by the U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, includes suggested questions to ask your surgeon and other members of your surgical team to help you prepare for surgery. Additional information can be found on their website at http://www.ahrq.gov.
    - ✓ Why do I need surgery?
    - ✓ What kind of surgery do I need?
    - ✓ What will you be doing?
    - ✓ Have you done this surgery before? How many times?
    - ✓ How successful is this surgery?
    - ✓ Will I need anesthesia?
    - ✓ How long will the surgery take?
    - ✓ What will happen after the surgery?
    - ✓ What kind of pain can I expect?
    - ✓ How long will I be in the hospital?
    - ✓ How long will it take me to recover?
    - ✓ What are the benefits and risks of having this surgery?
    - ✓ What are the possible complications?
    - ✓ What are the alternatives to surgery?
    - ✓ How much will the surgery cost?
    - ✓ Will my insurance cover the surgery?
    - ✓ Why is your hospital best for this surgery?

These and other sets of guidelines for preventing such HAI as central line and urinary catheter associated infections, as well as *C. difficile* and MRSA infections can be found on CDC's website, www.cdc.gov.

Dialysis Facility Patients

In addition to hospital and surgical patients, chronic dialysis patients are at high risk for HAI. Their heightened risk is, in part, due to the nature of the dialysis process. This process requires vascular access (generally through insertion of a catheter into a vein in the arm or other body site) for prolonged periods, thus increasing the risk of infection through contaminated medical equipment, supplies, environmental surfaces, and hands of healthcare personnel. Dialysis patients also have weakened immune systems that increase their susceptibility to infections, and they are more likely to require hospitalizations and surgeries which further increase exposure to HAI. The following steps, published by the National Institutes of Health, National Institute of Diabetes, Digestive and Kidney Diseases, can help dialysis patients protect their vascular access site and reduce risk of infection.

- ✓ Make sure your nurse or technician checks your access site before each treatment.
- ✓ Keep your access site clean at all times.
- ✓ Use your access site only for dialysis.
- ✓ Be careful not to bump or cut your access.
- ✓ Don't let anyone put a blood pressure cuff on your access arm.
- ✓ Don't wear jewelry or tight clothes over your access site.
- ✓ Don't sleep with your access arm under your head or body.
- ✓ Don't lift heavy objects or put pressure on your access arm.
- ✓ Check the pulse in your access every day.

These steps and other useful information can be found on the National Kidney and Urologic diseases Information Clearing house website:[4]

Another useful internet tool for dialysis patients is Medicare's Dialysis Facility Compare (DFC). This website provides useful information about kidney disease, the dialysis process, and Medicare-approved dialysis facilities nationwide. It presents facility contact information and characteristics such as types of dialysis offered (in-center dialysis, peritoneal dialysis, and home dialysis training), number of treatment stations, number of shifts starting 5 PM or later, initial date of Medicare certification, and ownership type (profit or non-profit). It provides a "compare" function, so that consumers can compare selected facilities in terms of

[4] Vascular Access for Dialysis. <http://kidney.niddk.nih.gov/KUDiseases/pubs/vascularaccess/#venouscathter>.

characteristics, services, and healthcare quality indicators. This information can help dialysis patients select dialysis facilities that best meet their needs, and patients already receiving dialysis can review their facility's information and discuss it with their dialysis caregivers. DFC also provides a kidney disease dictionary, a list of dialysis patient rights and responsibilities, frequently asked questions, and links to national kidney disease and transplant organizations that provide valuable educational materials.

Healthcare Consumer Resources

Healthcare quality means that patients get the right medicine, treatments, and medical tests at the right times for their condition. Facilities vary in the quality of care they provide, but there are many resources available to inform decisions about where to receive healthcare. Valuable information for healthcare related decisions can be found on the websites listed below. The first three websites listed enable facility comparisons on various quality indicators, and include two Centers for Medicare and Medicaid Services (CMS) websites that compare CMS approved facilities nationwide and a Colorado Hospital Association website that compares hospitals in Colorado only.

- Medicare Hospital Compare website: www.hospitalcompare.hhs.gov or www.medicare.gov.
- Medicare Dialysis Facility Compare website: www.medicare.gov/dialysis/home.asp.
- Colorado Hospital Report Card website: www.cha.com.
- Centers for Disease Control: www.cdc.gov.
- The Leap Frog Group: http://www.leapfroggroup.org/
- Institute for Healthcare Improvement: http://www.ihi.org/ihi
- Colorado Foundation for Medical Care: http://www.cfmc.org

The practice of posting healthcare facility information on websites encourages accountability and continuous improvement in the quality of care provided. Beyond website resources, there are several national and international associations focused on safe healthcare that can also provide useful information on HAI and healthcare quality, in general:

- Agency for Healthcare Research and Quality
- American Hospital Association (AHA)
- Association for Professionals in Infection Control and Epidemiology, Inc (APIC)

- Centers for Medicare & Medicaid Services (CMS)
- Consumers Union
- Council of State and Territorial Epidemiologists (CSTE)
- Department of Health and Human Services (HHS)
- Food and Drug Administration (FDA)
- Infectious Diseases Society of America (IDSA)
- The Joint Commission (TJC)
- Safe Care Campaign
- Safe Injection Practices Coalition
- Society for Healthcare Epidemiology of America (SHEA)

To get the best use of the resources presented above, consumers should also always consult with their doctors, hospitals, families and friends before deciding where to receive care. In doing so, they should consider the experience of the facility, staff and other quality indicators in addition to the infection data presented in this report. This report should be used as one of many quality indicators and cannot, on its own, provide a complete picture of healthcare quality in Colorado facilities.

The Hospital Report Card released by The Colorado Hospital Association is a valuable internet source for consumers in Colorado. The website offers user-friendly data with graphs and tables and incorporates additional patient safety metrics among hospitals 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.

Appendix E: SIR Overview

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

1. CLABSI in Adult Critical Care Units and Long-term Acute Care Hospitals
2. CLABSI and UCABI in Neonatal Critical Care Units
3. SSI in Hospitals and Ambulatory Surgery Centers (hernia procedures only)
4. SSI in Ambulatory Surgery Centers (hip and knee replacement procedures)
5. DRI in Dialysis Centers
6. Hospital-wide SIR calculation

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

The statistical significance of is the observed SSI compared to its expected SSI based on the national average is tested using a Poisson test. A p-value is computed from the test and helps to determine if the difference in the 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 (**SAME**) between the hospital's SSI count and the expected count based on the national rate.

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

1. CLABSI- Adult Critical Care Unit and Long-term Acute Care Hospital

Risk category:	# of CLABSI	# of central line days	Hospital CLABSI Rate (CLABSI per 1000 central line days)	NHSN Rate (CLABSI per 1000 central line days)	Expected # of CLABSI
Medical CCU	2	1300	1.54	1.3	1.69

An example for calculating the CLABSI rate for a medical CCU, expected number for the unit, and total expected CLABSI is shown below:

Observed CLABSI rate for Medical CCU = $\frac{\text{2 CLABSI}}{\text{1300 central line days}}$ * 1000 = 1.54 CLABSI/1000 central line days

Expected CLABSI Medical CCU = # of central line days * NHSN rate = 1300 * 1.3/1000 = 1.69

The SIR is the ratio of the observed to expected CLABSI:

SIR = observed CLABSI = $\frac{2}{1.69}$ = 1.18
expected CLABSI

2. CLABSI and UCABI - Neonatal Critical Care Unit

CLABSI

Birth weight categories	# of CLABSI	# of central line days	Hospital CLABSI Rate (CLABSI per 1000 central line days)	NHSN Rate (CLABSI per 1000 central line days)	Expected # of CLABSI
≤ 1.65 lbs	1	1000	1.0	4.9	4.9
1.66 – 2.2lbs	2	1350	1.5	3.2	4.3
2.3 – 3.3lbs	3	1250	2.4	2.0	2.5
3.4 – 5.5lbs	2	1500	4.0	1.5	2.3
≥ 5.5lbs	1	1400	2.5	1.2	1.3
TOTAL	9	6500	--	--	15.3

UCABI

Birth weight categories	# of UCABI	# of umbilical line days	Hospital UCABI Rate UCABI per 1000 central line days)	NHSN Rate (UCABI per 1000 central line days)	Expected # of UCABI
≤ 1.65 lbs	2	500	4.0	3.9	2.0
1.66 – 2.2lbs	1	1250	0.8	3.0	3.8
2.3 – 3.3lbs	4	1350	3.0	2.5	3.4
3.4 – 5.5lbs	0	1750	0.0	1.4	2.5
≥ 5.5lbs	2	250	8.0	1.0	0.3
TOTAL	9	5100	--	--	12

An example for calculating the CLABSI rate for birth weight category 1, expected number of CLABSI for birth weight category 1, and total expected CLABSI is shown below:

$$\text{Observed CLABSI rate for birth weight category 1} = \frac{1 \text{ CLABSI}}{100 \text{ central line days}} * 100 = 1.0$$

Expected CLABSI for birth weight category 1 = (# of central line days * NHSN rate)/1000 = 1000 * 4.9/1000 = 4.9

Expected CLABSI overall = sum expected CLABSI = 4.9 + 4.3 + 2.5 + 2.3 + 1.3 = 15.3
Expected UCABI overall = sum expected UCABI = 2.0 + 3.8 + 3.4 + 2.5 + 0.3 = 12

NCCU expected number of infections = CLABSI sum + UCABI sum = 15.3 + 12 = 27.3 expected infections
NCCU observed number of infections = CLABSI sum + UCABI sum = 9 + 9 = 18 observed infections

The SIR is the ratio of the observed number of bloodstream infections (BSI) to the expected number of BSI collapsed overall risk categories (birth weight) and line type (umbilical and central):

$$\text{SIR} = \frac{\text{observed BSI}}{\text{expected BSI}} = \frac{18}{27.3} = 0.66$$

3. SSI – Hospital (all procedures) and Ambulatory Surgery Center (Hernia Repair Procedures only)

Step 1: Assign a risk estimate to each patient

NHSN risk parameters	Example patient (have parameter or no)	Probability of SSI
Age, >44	Yes	0.006
ASA, >2	No	0.0
Duration, >100 minutes	Yes	0.003
Medical school affiliation	No	0.0
Sum		0.009

Patient 1 has a 0.009 probability of acquiring an infection based on the risk factors.

Step 2: Determine the risk estimate for the patient population at Facility A

Patient	Age	ASA	Duration (min)	Med School Affiliation	Probability of SSI	SSI (yes/no)
1	52	2	100	Yes	0.005	No
2	36	3	25	Yes	0.009	No
3	26	1	36	Yes	0.001	Yes
-	-	-	-	-	-	-
-	-	-	-	-	-	-
50	23	4	96	Yes	0.05	Yes
					2.4	2.0

Facility A is expected to have 2.4 SSI based on the patients who had surgery.

The SIR is the ratio of the observed to expected SSI:

$$SIR = \frac{\text{observed SSI}}{\text{expected SSI}} = \frac{2.0}{2.4} = 0.8$$

4. SSI – Ambulatory Surgery Center: Orthopedic and Hysterectomy Procedures

Risk category	# of SSI	# of hip prosthesis procedures	Facility SSI Rate (SSIs per 100 procedures)	NHSN Rate (SSIs per 100 procedures)	Expected # of SSI
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 SSI for risk category 1, and total expected SSI is shown below:

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

Expected SSI for risk category 1 = # procedures * NHSN rate/100 = 60 * 1.65/100 = 0.99
Expected SSI overall = Sum of expected SSI = 0.86 + .99 + 0.76 = 2.61

The SIR is the ratio of the observed number of SSI to the expected number of SSI collapsed overall risk categories, i.e. after standardizing for the patient categories.

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

5. DRI in Dialysis clinics

Access type	# of DRI	# of patients	Facility DRI Rate (DRI per 100 patients)	NHSN Rate (DRI per 100 patients)	Expected # of DRI
Graft	2	52	3.8	0.4	0.2
Fistula	4	42	9.5	0.2	0.08
Temporary central line	0	29	0.0	5.1	1.5
Permanent central line	5	36	13.9	1.7	0.6
TOTAL	11	159	--	--	2.4

An example for calculating the DRI rate for a graft, expected number of DRI for a graft, and total expected DRI for the facility is shown below:

DRI rate for graft = $\frac{2 \text{ DRI}}{52 \text{ patients}} * 100 = 3.8$

Expected DRI for graft = # patients * NHSN rate/100 = 52 * 0.4/100 = 0.2
Expected DRI overall = Sum of expected DRI = 0.2 + 0.08 + 1.5 + 0.6 = 2.4

The SIR is the ratio of the observed number of DRI to the expected number of DRI collapsed over all access types:

SIR = $\frac{\text{observed DRI}}{\text{expected SSI}} = \frac{11}{2.4} = 4.6$

6. Hospital-wide SIR calculation

Hospital X reports infections for:

Medical/Surgical critical care unit
Hip Replacement Procedures
Knee Replacement Procedures
Hernia repairs

Critical care unit or procedure	Observed # of infections	Expected # of infections*
Medical/Surgical CCU	6	7.8
Hip replacement procedures	3	9.8
Knee replacement procedures	1	4.5
Hernia repairs	0	3.5

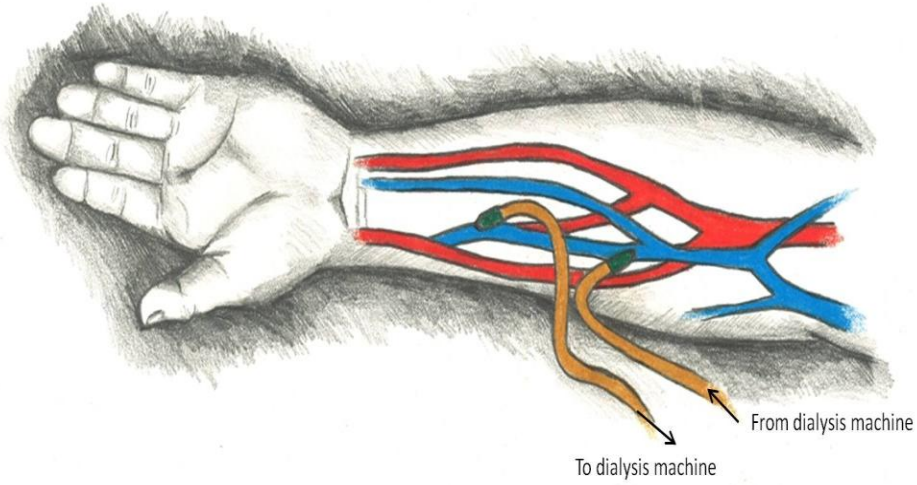
*Refer to the above sections for the expected calculations.

Overall observed infections for time period: 6 + 3 + 1 + 0 = 10 observed infections

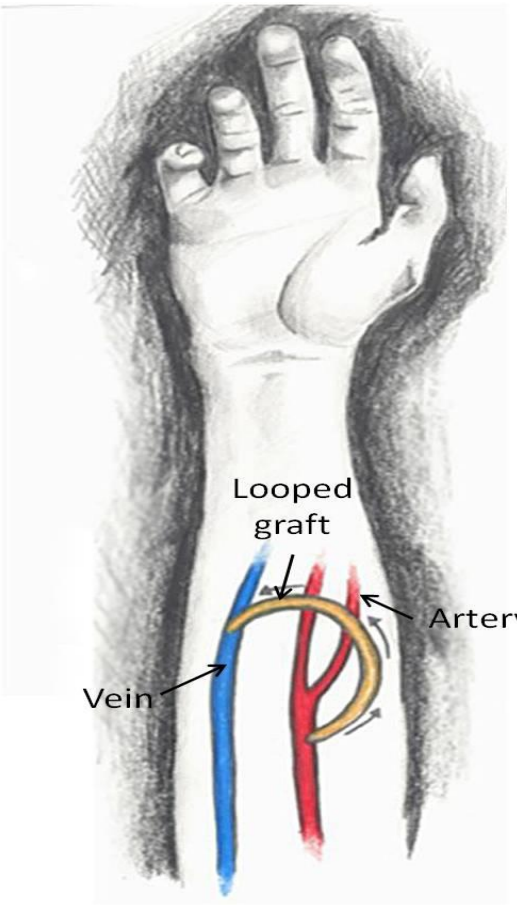
Overall expected infections for time period: 7.8 + 9.8 + 4.5 + 3.5 = 25.6 expected infections

Hospital-wide SIR = observed # of infections/expected # of infections = 10/25.6 = 0.39

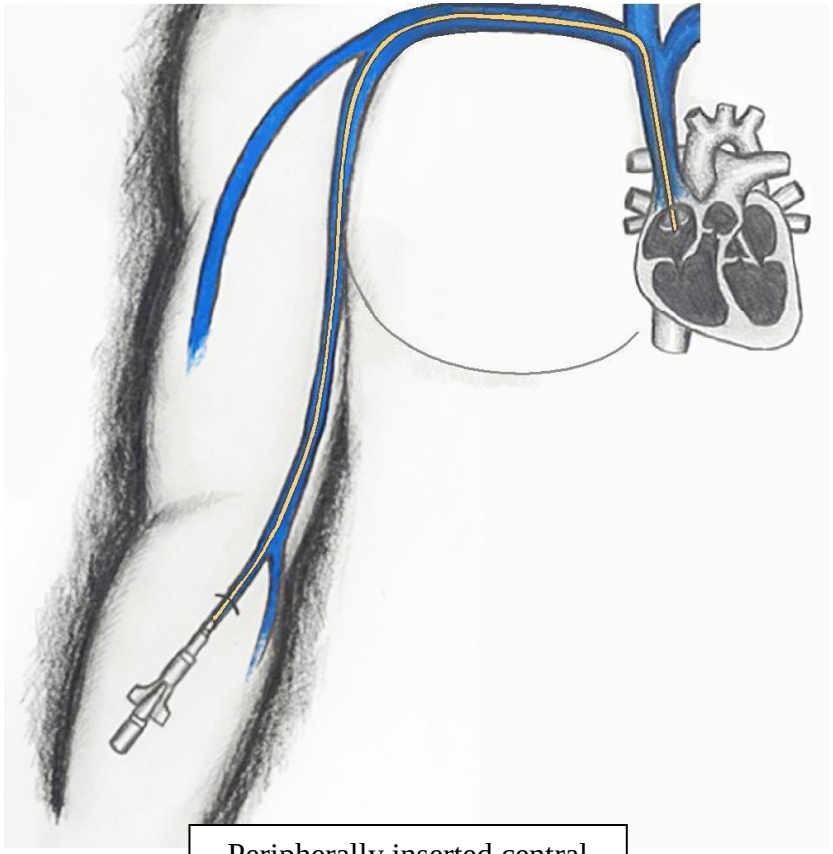
Appendix F: Vascular access types



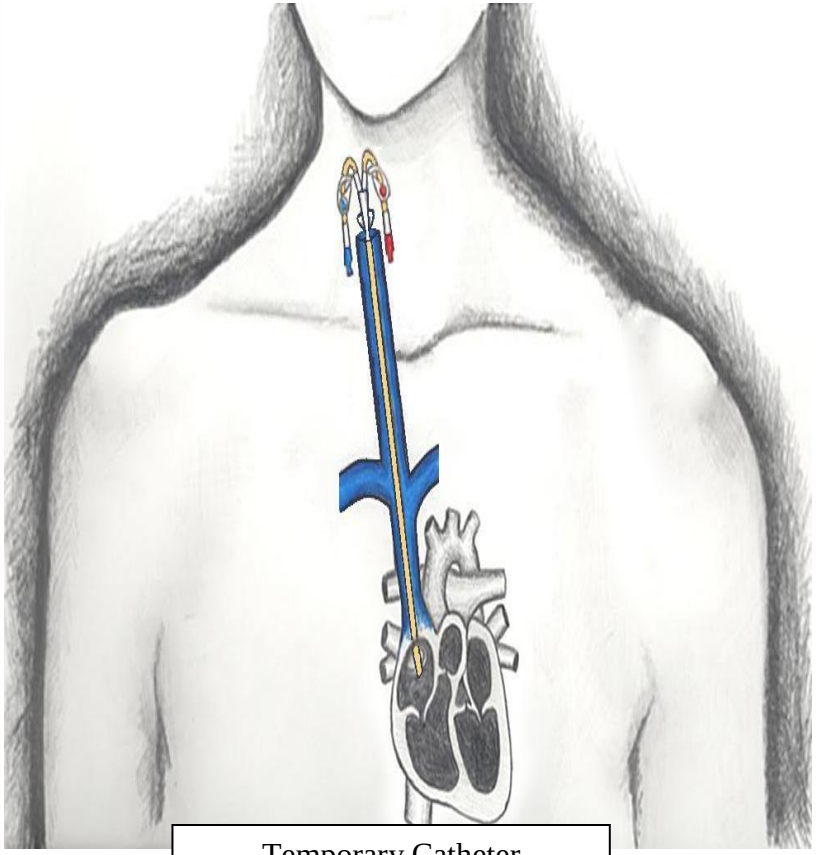
Fistula



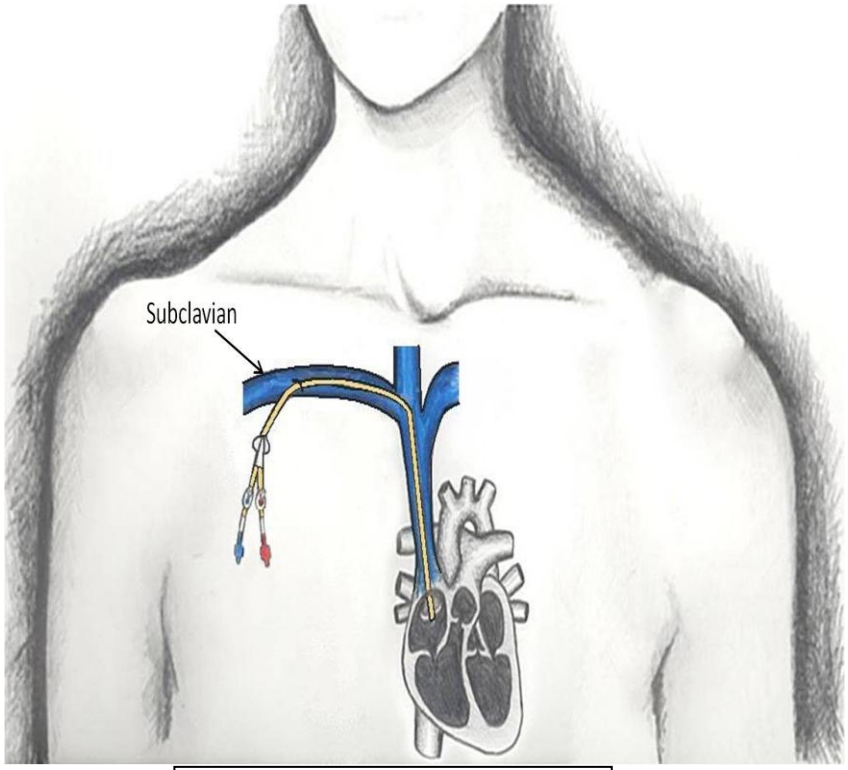
Graft



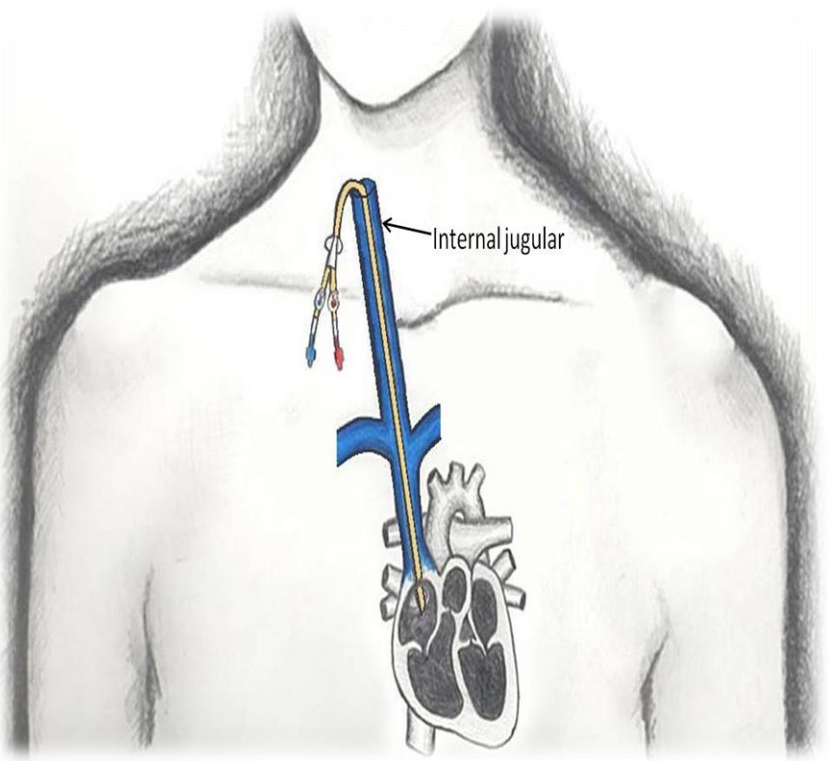
Peripherally inserted central line catheter



Temporary Catheter



Temporary Subclavian Catheter



Temporary Internal Jugular Catheter

Pictures provided by Rachel Yarbrough.

Appendix G: Glossary of Terms and Abbreviations

Glossary of terms

Term	Definition
Access-associated Bacteremia	The presence of bacteria in the blood verified by culture with the source identified as the vascular access site or is unknown.
Active Surveillance	A system used by a trained infection preventionist (IP) to look for infections during a patient's hospital stay. A variety of tools are used to identify infections and determine if they are related to their hospital stay or to determine if an infection was present on hospital admission. These tools may include, but are not limited to, information from various sources such as the laboratory, radiology department, surgical service units, nursing care units and patient treatment areas, environmental services, rounds with unit staff, electronic clinical data reporting systems, and pharmacy reports.
Ambulatory Surgery Center	A facility which operates exclusively for the purpose of providing surgical services to patients not requiring hospitalization.
Arteriovenous (AV) Fistula	A surgically created connection between an artery and a vein usually in the forearm for the purpose of vascular access during dialysis treatments. The vein portion grows larger allowing easier access during dialysis. Patients must have another means of access for dialysis until the fistula matures (usually weeks to months). A fistula can last several years and has the lowest complication rate of dialysis access types.
Arteriovenous (AV) Graft	A surgically implanted synthetic tube or graft under the skin in the arm connecting an artery to a vein for the purpose of vascular access during dialysis. Usually performed when a patient's veins are too small to develop properly into a fistula. A graft can last several years.

Bacteremia	The presence of viable bacteria in circulating blood and which can be persistent or recurrent due to infection.
Birth weight Categories	The weight of an infant at the time of birth. Infants remain in their birth weight category even if they gain weight. Birth weight category is important because the lower the birth weight, the higher the risk of developing an infection.
Bloodstream Infection (BSI)	An infection of the blood.
Case	Instance of a particular disease, injury, or other health condition that meet selected criteria.
Case Definition	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.
Catheter-Associated Urinary Tract Infection (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 (intravascular catheter) that terminates at or close to the heart or in one of the great vessels. 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 infection (CLABSI)	A primary bloodstream infection (BSI) in a patient that had a central line within the 48-hour period before the development of the BSI. If the BSI develops within 48-hours of discharge from a location, it is associated with the discharging location.
Central Line Bloodstream Infection (CLABSI) Rate	The total number of central line-associated bloodstream infections divided by the number of central line days multiplied by 1,000. Lower rates are better.
Central Line Days (Device Days)	The total number of days a central line is used for patients in a CCU or a NCCU. A daily count of patients with a central line in place is performed at the same time each day. Each patient with one or more central lines at the time the daily count is performed is counted as one central line day.
Certification Board of Infection Control and Applied Epidemiology (CBIC)	The Certification Board of Infection Control and Epidemiology, Inc., is an organization that certifies infection preventionists 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.

Coronary Artery Bypass Graft Surgery	A surgical treatment for heart disease in which a vein or artery from another part of the body is used to create an alternate path for blood to flow to the heart bypassing a blocked artery.
Critical Care Unit (CCU)	A nursing care area that provides intensive observation, diagnosis, and therapeutic procedures for adults and/or children who are critically ill. In Colorado certain intensive care units designated as such by the facility are required by law to report central line-associated bloodstream infections. These include: medical-surgical critical care (MSCCU), medical critical care (MCCU), surgical critical care (SCCU), cardiothoracic critical care (CTCCU), cardiac critical care (CCCU), and neonatal critical care (NCCU) levels II/III and III.
Device Days	The number of patients who have a specific device (e.g., central line, ventilator, or indwelling urinary catheter) recorded at the same time each day for each day of the month with a total sum obtained for the month.
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.
Dialysis Event (DE)	An event for a dialysis patient involving any one of three possible scenarios: 1) hospitalization; 2) intravenous (IV) antimicrobial start; or 3) a positive blood culture. Dialysis event reporting involves *outpatient* facilities only.
Donor Incision Site	The site of a secondary incision by a surgeon for the purpose of removing tissue such as a vein, artery, or skin to be used at the primary incision site.
Drug-resistant infections	Infections that are resistant to antibiotics commonly used to kill 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	Contact with a cause of, or possession of a characteristic that is a determinant of a particular health problem.
Fascia	A thin layer of connective tissue covering, supporting, or connecting the muscles or inner organs of the body.
Great Vessel	Based on NHSN criteria for reporting central line BSI, the following are considered great vessels: aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, common femoral veins, and in neonates, the umbilical artery and vein.
Health	State of complete physical, mental and social well-being and not merely the absence of disease or other infirmity.
Health Facility Acquired Infection or Healthcare-Associated Infection (HAI)	An infection of a patient that occurs in a healthcare setting which was not present or incubating at the time of admission and is not related to a previous admission.
Heart bypass or coronary artery bypass graft	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 Surgery	An elective procedure for people with severe hip damage or pain related to chronic osteoarthritis, rheumatoid arthritis or other degenerative processes involving the hip joint. Hip replacement surgery involves removing damaged cartilage and bone from the hip joint and replacing them with new, man-made parts.

Implant	A nonhuman-derived object, material, or tissue that is permanently placed in a patient during an operation. Examples include: heart valves, metal rods, mesh, wires, screws, cements, hip replacements and other devices.
Infant	A child less than one year old.
Infection	An invasion of the body tissues by an infectious agent.
Infection Preventionist (IP)	A health professional that has special training in infection prevention and monitoring.
Inpatient	A patient whose date of admission to a healthcare facility and the date of discharge are different calendar days.
IV Antimicrobial Start	The first dose of a medication given intravenously to kill microscopic infectious organisms such as bacteria and viruses in the body.
Knee Replacement	Surgery (arthroplasty) 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.
Local Access Infection	Pus, redness, or swelling of the vascular access site without the presence of access-associated bacteremia, patient hospitalization, or initiation of an IV antimicrobial agent.
Location	The specific patient care area to which a patient is assigned while receiving care in the healthcare facility.

Location of Attribution	The inpatient location where the patient was assigned on the date of the bloodstream infection (BSI) event, which is further defined as the date when the first clinical evidence appeared or the date the specimen used to meet the BSI criteria was collected, whichever came first.
Long-Term Acute Care Hospital (LTACH)	A specialty care hospital that cares for patients with serious medical conditions that require intense, special treatment for long periods of time (an average length of stay is 25 days).
Methicillin-Resistant *Staphylococcus aureus* (MRSA)	A strain of *Staphylococcus aureus* that is not killed by a class of penicillin-related antibiotics, including methicillin and oxacillin, drugs commonly used to treat *Staphylococcus aureus* infections.
Metric	A measurement for calculating health outcomes. There are both process metrics that measure adherence to standard healthcare quality processes, and outcome metrics that measure the number of patients affected by specific medical treatments.
Mortality	Death
National Healthcare Safety Network (NHSN)	A standardized data reporting system that Colorado healthcare facilities must use to identify and report select HAI and enter required data on uninfected patients. NHSN is a secure, internet-based surveillance (monitoring and reporting) system managed by the CDC's Division of Healthcare Quality Promotion
NHSN Operative Procedure	A procedure that meets the following criteria: 1) performed on a patient who is a NHSN inpatient or outpatient; 2) takes place during an operation; and 3) included in the NHSN operative procedure categories.
Neonate	A patient who is an infant less than or up to 30 days of age.
Neonatal Critical Care Unit	A patient care area that provides care to the most critically ill infants.

Nosocomial	New condition associated with being treated in a hospital (e.g., hospital-acquired infection), 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.
Operative Procedure	An operation that takes place during a single trip to the operating room (OR) where a surgeon makes at least one incision (cut) through the skin or mucous membrane, and stitches or staples the incision before the patient leaves the OR.
Outpatient	A patient whose date of admission to the healthcare facility and the date of discharge are the same day.
Patient Days	The total number of inpatients for a particular unit determined at the same time each day for every day of the month recorded as a total sum for the month.
Permanent Central Line	A catheter that is tunneled under the skin on the chest wall. Includes certain dialysis catheters (e.g., Hickman, Groshong, and Broviac) and implantable venous access ports (e.g., Port-a-Cath). Some dialysis patients may still have a port used for dialysis; however, most dialysis patients do not use this type of access due to the increased risk of infection. Ports are frequently used for administration of chemotherapeutic agents.
PICC Line	A peripherally inserted central catheter placed in the arm of the patient. By NHSN definition it is a temporary central line.
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).
Post-discharge Surveillance	The process infection preventionists use to seek out infections after patients have been discharged from the hospital. It includes screening various data sources including re-admissions, emergency department visits, and/or contacting the patient's doctor.

Prevalence	The number or proportion of cases, events or attributes among a given population.
Rate	An expression of the relative frequency with which an event occurs among a defined population and specific time period calculated as the number of new cases or deaths during a specified period divided by either person-time or the average (mid-interval) population. In epidemiology, it is often used in reference to proportions that are not truly rates (e.g., attack rate or case-fatality rate).
Risk	The probability that an adverse event will occur (e.g., that a person will be affected by, or die from, an illness, injury, or other health condition within a specified time or age span).
Risk Adjustment	Risk adjustment accounts for differences in patient populations and allows for hospitals to be compared. A hospital that performs a large number of complex procedures on very sick patients would be expected to have a higher infection rate than a hospital that performs more routine procedures on healthier patients.
Risk-Adjusted Rate	For surgical site infections, the risk-adjusted rate is based on a comparison of the actual (observed) rate and the expected rate if nationwide the patients had the same distribution of risk factors as the hospital. For CLABSI, the adjusted rate is a comparison of the actual rate and the expected rate based on national rates for each ICU or within birth weight categories for neonates.
Risk Factor	An aspect of personal behavior or lifestyle, an environmental exposure, or a hereditary characteristic that is associated with an increase in the occurrence of a particular disease, injury, or other health condition.
Standardized Infection Ratio (SIR)	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 health facility based on the expected number of infections after adjusting for the risk category. It is the ratio of the observed to expected number of SSI. The SIR can be used as a comparison measure between facilities.

Surgical Site Infections (SSIs)	Infections that are directly related to an operative procedure. Some SSI are minor and only involve the skin or subcutaneous tissue. Other SSI may be deeper and more serious.
Surgical Site Infection Rate	Surgical site infection rates per 100 operative procedures are found by dividing the number of SSI by the total number of specific operative procedures within a given reporting period. The results are then multiplied by 100. These calculations are performed separately for each type of surgical procedure. They are listed by risk level.
Symptom	Any indication of disease noticed or felt by a patient.
Temporary Central Line	A central line that is not tunneled.
The Department	The Colorado Department of Public Health and Environment (CDPHE).
Transfer Rule	If a device-associated infection develops within 48 hours of transfer from one inpatient location to another in the same facility, the infection is attributed to the transferring location.
Trend	Movement or change in frequency over time, usually upwards or downwards.
Umbilical Catheter	A tube that is inserted through an umbilical blood vessel (artery or vein) in a neonate.
Umbilical Catheter Days (Device Days)	The total number of days an umbilical catheter is present in newborns in a NCCU. The count is performed at the same time each day. Each newborn with both an umbilical catheter and a central line is counted as one umbilical catheter day.
Validation	A method of assessing the completeness and accuracy of reported HAI data.

Vascular Access Infection	An infection that is either a local access infection or access-associated bacteremia.
Ventilator-Associated Pneumonia (VAP)	A pneumonia (PNEU) that occurs in a patient who was intubated and ventilated at the time of or within 48 hours before the onset of the pneumonia. There is no minimum time period of time that the ventilator must be in place in order for the PNEU to be considered ventilator associated. If the PNEU develops in a patient within 48 hours of discharge from a location, the VAP is associated with the discharging location, not the current location.
Wound Class	An assessment of the likelihood and degree of contamination of a surgical wound at the time of the operation. Wounds are divided into four classes: Clean: An uninfected operation body site is encountered and the respiratory, digestive, genital, or uninfected urinary tracts are not entered Clean-Contaminated: Operation body sites in which the respiratory, digestive, genital or urinary tracts are entered under controlled conditions and without unusual contamination Contaminated: Operation body sites that have recently undergone trauma, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract Dirty or Infected: Includes old traumatic wounds with retained dead tissue and those that involve existing infection or perforated intestines

Abbreviations

ARB	Access-Related Bacteremia
ASC	Ambulatory Surgery Center
BSI	Bloodstream Infection
CABG	Coronary Artery Bypass Graft
CBIC	Certification Board of Infection Control and Epidemiology, Inc.
CCU	Critical Care Unit
CDC	Centers for Disease Control and Prevention
CDPHE	Colorado Department of Public Health and Environment
CHA	Colorado Hospital Association
CIC	Certification in Infection Control and Epidemiology
CL	Central Line
CLABSI	Central Line-Associated Bloodstream Infection
COHFAIAC	Colorado Health Facilities-Acquired Infection Advisory Committee
CMS	Centers for Medicare and Medicaid Services
DE	Dialysis Event
DIP	Deep Incisional Infection at the Primary Surgical Site (for CABG procedures, this would be the chest site)

DIS	Deep Incisional Infection at the Secondary Surgical Site (for CABG procedures, this would be the donor vessel site)
DRI	Dialysis-related Infection
DTC	Dialysis Treatment Center
HAI	Healthcare-Associated Infection or Hospital-Acquired Infection
HHS	Department of Health and Human Services
HER	Hernia repair
HICPAC	Healthcare Infection Control Practices Advisory Committee
HPRO	Hip prosthesis (total or partial)
ICP	Infection Control Professional or Preventionist (interchangeable with IP)
ICU	Intensive care unit
IP	Infection Professional or Preventionist
KPRO	Knee prosthesis (total or partial)
LAI	Local access Infection
LTACH	Long-term Acute Care Hospital
MDRO	Multi-Drug Resistant Organism
MRSA	Methicillin-Resistant *Staphylococcus aureus*
NCCU	Neonatal Critical Care Unit

NHSN	National Healthcare Safety Network
PICC	Peripherally inserted central catheter
SHEA	Society for Healthcare Epidemiology of America
SIP	Superficial Incisional Infection at a primary surgical site (e.g., chest incision site for CABG procedure)
SIR	Standardized Infection Ratio
SIS	Superficial Incisional Infection at a secondary surgical site (e.g., donor vessel site for CABG procedure),
SSI	Surgical Site Infection
UB	Umbilical Catheter
UCABI	Umbilical Catheter-Associated Bloodstream Infection
VAP	Ventilator-Associated Pneumonia