

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

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

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

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

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

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

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

ABDOMINAL PROCEDURES

BACKGROUND

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

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

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

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

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

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

COLON SURGERIES

Colon surgeries involve the small and large intestines, muscular tubes that extend from the end of the stomach to the rectum. The intestines carry bacteria as part of the digestive process, and therefore have a high risk for contamination and infection. Facilities began reporting colon procedures on January 1, 2012, as part of the Centers for Medicare and Medicaid Services (CMS) reporting requirements.

RESULTS

Table 13 shows facility specific data for SSI attributed to colon surgeries performed from August 1, 2012 through July 31, 2015.

Fifty-seven hospitals reported 4,621 **colon surgeries** this past year and four hospitals reported zero SSI. Four hospitals had colon SSI rates better than the national average, and two hospitals had a rate worse than the national average; all others had rates similar to the national average. When combining data across all Colorado hospitals (Table 5), the statewide aggregate rate for colon SSI has been better than the national average since reporting of these surgeries began.

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TABLE 13: Number of Surgical Site Infections and Standardized Infection Ratios for Colon Surgeries in Hospitals - Colorado, August 2012 – July 2015

Surgical Site Infections in Colon Procedures in Hospitals: August 1, 2012 – July 31, 2015													
Health Facility and City		August 2012-July 2013				August 2013-July 2014				August 2014-July 2015			
		No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison	No. of Procedures	No. of Infections	SIR	National Comparison
Arkansas Valley Regional MC	La Junta	12	***	***	***	12	***	***	***	6	***	***	***
Aspen Valley Hospital	Aspen	6	***	***	***	6	***	***	***	6	***	***	***
Boulder Community Hospital	Boulder	75	4	0.9	Same	102	4	0.7	Same	15	***	***	***
Boulder Community Hospital-Foothills	Boulder	14	***	***	***	2	***	***	***	81	7	1.5	Same
Castle Rock Adventist Hospital	Castle Rock	Not yet operating				23	2	1.5	Same	23	0	0	Same
Centura Avista Adventist Hospital	Louisville	39	2	0.9	Same	32	1	0.5	Same	39	3	1.5	Same
Centura Littleton Adventist Hospital	Littleton	102	4	0.7	Same	83	4	0.8	Same	64	3	0.8	Same
Centura Penrose St Francis Health	CO Springs	214	8	0.7	Same	206	18	1.6	Same	226	22	1.7	Worse
Centura Porter Adventist Hospital	Denver	82	4	0.9	Same	67	3	0.8	Same	75	1	0.2	Same
Centura St Anthony Central Hospital	Denver	122	14	1.9	Worse	115	5	0.7	Same	113	5	0.7	Same
Centura St Anthony North Hospital	Westminster	75	4	1	Same	86	3	0.6	Same	57	4	1.2	Same
Centura St Francis MC	CO Springs	68	2	0.6	Same	90	2	0.4	Same	80	3	0.7	Same
Centura St Mary Corwin MC	Pueblo	52	3	1	Same	51	3	0.9	Same	67	1	0.2	Same
Centura St Thomas More Hospital	Canon City	44	4	1.7	Same	47	4	1.6	Same	35	2	1	Same
Colorado Plains MC	Fort Morgan	19	***	***	***	15	***	***	***	7	***	***	***
Community Hospital	Grand Junction	41	4	1.8	Same	52	2	0.7	Same	75	3	0.7	Same
Delta County Memorial Hospital	Delta	28	2	1.2	Same	35	2	1.1	Same	21	0	0	Same
Denver Health MC	Denver	147	18	1.6	Same	94	12	1.8	Same	87	13	2.2	Worse
East Morgan County Hospital	Brush	0	***	***	***	5	***	***	***	2	***	***	***
Exempla Good Samaritan MC	Lafayette	180	5	0.5	Same	165	9	0.9	Same	177	4	0.4	Same
Exempla Lutheran MC	Wheat Ridge	152	7	0.8	Same	172	9	0.8	Same	170	8	0.7	Same

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Exempla St Joseph Hospital	Denver	363	17	0.9	Same	337	11	0.6	Same	217	12	0.9	Same
Grand River MC	Rifle	4	***	***	***	0	***	***	***	8	***	***	***
Gunnison Valley Hospital	Gunnison	0	***	***	***	1	***	***	***	1	***	***	***
Heart of the Rockies Regional MC	Salida	16	***	***	***	14	***	***	***	11	***	***	***
Longmont United Hospital	Longmont	91	5	1	Same	99	5	0.9	Same	102	2	0.3	Same
McKee MC	Loveland	76	2	0.5	Same	81	5	1.2	Same	80	7	1.5	Same
MC of Aurora	Aurora	122	10	1.5	Same	108	3	0.5	Same	123	7	1.1	Same
Memorial Hospital Central	CO Springs	143	6	0.7	Same	211	9	0.7	Same	230	9	0.7	Same
Memorial Hospital North	CO Springs	56	0	0	Same	55	4	1.5	Same	62	3	1	Same
Mercy Regional MC	Durango	46	0	0	Same	40	0	0	Same	58	1	0.3	Same
Montrose Memorial Hospital	Montrose	41	2	0.8	Same	29	0	0	Same	41	4	1.8	Same
Mt San Rafael Hospital	Trinidad	1	***	***	***	2	***	***	***	6	***	***	***
North Colorado MC	Greeley	157	14	1.6	Same	163	9	0.9	Same	172	13	1.3	Same
North Suburban MC	Thornton	62	1	0.3	Same	73	1	0.2	Same	38	3	1.4	Same
Pagosa Springs MC	Pagosa Springs	1	***	***	***	1	***	***	***	4	***	***	***
Parker Adventist Hospital	Parker	128	5	0.7	Same	121	2	0.3	Same	111	3	0.5	Same
Parkview MC	Pueblo	109	6	1.1	Same	116	4	0.7	Same	155	12	1.5	Same
Pikes Peak Regional Hospital	Woodland Park	8	***	***	***	4	***	***	***	3	***	***	***
Platte Valley MC	Brighton	31	4	2.3	Same	23	3	2.5	Same	28	0	0	Same
Poudre Valley Hospital	Ft Collins	166	5	0.6	Same	161	8	1	Same	174	3	0.3	Better
Presbyterian St Lukes MC	Denver	131	2	0.3	Same	107	1	0.2	Better	127	4	0.6	Same
Prowers MC	Lamar	1	***	***	***	4	***	***	***	8	***	***	***
Rose MC	Denver	192	4	0.4	Same	228	2	0.2	Better	219	10	1	Same
San Luis Valley Regional MC	Alamosa	15	***	***	***	12	***	***	***	16	***	***	***
Sky Ridge MC	Lone Tree	150	9	1.2	Same	159	5	0.6	Same	199	3	0.3	Better
Southwest Memorial Hospital	Cortez	16	***	***	***	18	***	***	***	15	***	***	***
St Anthony Summit MC	Frisco	6	***	***	***	8	***	***	***	6	***	***	***
St Marys Hospital	Grand Junction	184	3	0.3	Same	199	3	0.3	Better	179	3	0.3	Better
Sterling Regional MC	Sterling	17	***	***	***	10	***	***	***	20	1	0.8	Same

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Swedish MC	Englewood	294	14	0.9	Same	328	13	0.7	Same	317	18	1.1	Same
The Childrens Hospital	Aurora	74	1	0.2	Same	106	3	0.5	Same	85	1	0.2	Same
University of Colorado Hospital	Aurora	220	6	0.3	Better	292	4	0.2	Better	327	6	0.2	Better
Vail Valley MC	Vail	15	***	***	***	9	***	***	***	11	***	***	***
Valley View Hospital	Glenwood Springs	26	3	1.9	Same	46	3	1.1	Same	24	0	0	Same
Yampa Valley MC	Steamboat Springs	9	***	***	***	8	***	***	***	17	***	***	***
Yuma District Hospital	Yuma	0	***	***	***	1	***	***	***	1	***	***	***

Note: SIR=Standardized Infection Ratio, the ratio of observed to expected infections adjusted for procedure risk factors; MC=Medical Center.

National comparison based on the indirect adjustment of modeled risk factors for each procedure type.

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

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

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