

CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS OVERVIEW

BACKGROUND

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

All patients with central lines are at risk for CLABSI. However, certain groups are at higher risk for infection: elderly, neonates, dialysis patients, patients with weak immune systems (e.g., cancer patients, transplant patients), diabetics and patients with burn injuries¹⁰⁻¹².

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

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

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

ADULT CRITICAL CARE UNITS

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

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

RESULTS

Table 18 shows facility specific data for **CLABSI** attributed to adult critical care units from August 1, 2012 through July 31, 2015.

Sixty-two adult critical care units in 48 Colorado hospitals reported 106,121 central line days in the last reporting periods. Of the 62 hospital units, 22 reported zero CLABSI. This year, one hospital had CLABSI rates worse than the national average and all others had rates similar to national rates. No hospital had rates better than the national average, compared to one hospital last year and two the year before.

This year, all but one hospital had CLABSI rates similar to national rates. No hospital had rates better than the national average, compared to one hospital last year and two the year before.

TABLE 18: Number of Central Line-Associated Bloodstream Infections in Adult Critical Care Units – Colorado, August 2012 – July 2015

Central Line-Associated Blood Stream Infections (CLABSI): August 1, 2012 – July 31, 2015														
Health Facility, City, Unit Type			August 2012 – July 2013				August 2013 – July 2014				August 2014 – July 2015			
			No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison	No. of CL Days	No. of Infections	SIR	National Comparison
Arkansas Valley Regional MC	La Junta	MICU/SICU	61	0	0	Same	198	0	0	Same	92	***	***	***
Aspen Valley Hospital	Aspen	MICU/SICU	54	0	0	Same	28	***	***	***	9	***	***	***
Boulder Community Hospital	Boulder	MICU/SICU	1,933	0	0	Same	1,926	0	0	Same	296	0	0	Same
Castle Rock Adventist	Castle Rock	MICU/SICU	Not yet operating				296	0	0	Same	389	0	0	Same
Centura Avista Adventist Hospital	Louisville	MICU/SICU	613	0	0	Same	401	0	0	Same	480	0	0	Same
Centura Littleton Adventist Hospital	Littleton	MICU/SICU	2,787	2	0.9	Same	3,291	3	1.1	Same	2,879	3	1.3	Same
Centura Penrose St Francis Health	CO Springs	MICU/SICU	3,763	5	1.7	Same	3,922	2	0.6	Same	3,640	3	1	Same
Centura Porter Adventist Hospital	Denver	MICU/SICU	3,661	2	0.7	Same	4,043	0	0	Same	3,991	0	0	Same
Centura St Anthony Central Hospital	Denver	MICU/SICU	1,737	3	2.2	Same	1,895	2	1.3	Same	1,605	1	0.8	Same
		MICU	2,073	0	0	Same	2,401	1	0.4	Same	1,838	1	0.5	Same
		NEURO ICU	1,753	2	1.3	Same	1,931	2	1.2	Same	1,902	6	3.5	Worse
		CSICU	2,074	0	0	Same	1,839	0	0	Same	1,444	1	0.9	Same
		Trauma ICU	1,744	1	0.4	Same	1,572	4	1.8	Same	1,515	1	0.5	Same
Centura St Anthony North Hospital	Westminster	MICU/SICU	2,335	1	0.4	Same	1,668	2	1.1	Same	1,651	0	0	Same
		MICU	499	1	1.7	Same	0	***	***	***	0	***	***	***
Centura St Francis MC	CO Springs	MICU/SICU	415	1	3	Same	431	0	0	Same	535	0	0	Same
Centura St Mary Corwin MC	Pueblo	MICU/SICU	1,658	2	1.5	Same	1,591	1	0.8	Same	1,519	3	2.5	Same
Centura St Thomas More Hospital	Canon City	MICU/SICU	106	0	0	Same	117	1	10.7	Same	48	***	***	***
Colorado Plains MC	Fort Morgan	MICU/SICU	36	***	***	***	19	***	***	***	9	***	***	***
Community Hospital	Grand Junction	MICU/SICU	69	0	0	Same	0	***	***	***	0	***	***	***
		Medical CCU	268	0	0	Same	271	0	0	Same	261	0	0	Same
Delta County Memorial Hospital	Delta	MICU/SICU	372	0	0	Same	416	0	0	Same	297	0	0	Same
Denver Health MC	Denver	MICU/SICU	3,196	5	1.3	Same	3,335	3	0.7	Same	2,898	4	1.2	Same
		Trauma CCU	2,794	0	0	Better	2,352	4	1.2	Same	2,009	5	1.8	Same
Exempla Good Samaritan MC	Lafayette	MICU/SICU	2,010	0	0	Same	1,562	1	0.8	Same	1,662	1	0.8	Same
Exempla Lutheran MC	Wheat Ridge	MICU/SICU	4,821	1	0.3	Same	3,691	0	0	Same	2,860	2	0.9	Same

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Exempla St Joseph Hospital	Denver	MICU/SICU	3,698	0	0	Better	3,303	0	0	Same	3,321	0	0	Same
Heart of the Rockies Regional MC	Salida	MICU/SICU	23	***	***	***	25	***	***	***	34	***	***	***
Longmont United Hospital	Longmont	MICU/SICU	2,429	0	0	Same	2,671	0	0	Same	2,950	0	0	Same
McKee MC	Loveland	MICU/SICU	817	0	0	Same	714	0	0	Same	721	0	0	Same
MC of Aurora	Aurora	MICU/SICU	4,793	5	1.3	Same	5,012	8	2	Same	4,576	2	0.5	Same
MC of the Rockies-South Wing	Loveland	MICU/SICU	4,021	0	0	Same	4,028	2	1.3	Same	4,305	1	0.5	Same
Memorial Hospital Central	CO Springs	MICU/SICU	4,963	3	0.8	Same	4,759	3	0.8	Same	4,879	3	0.8	Same
Memorial Hospital North	CO Springs	MICU/SICU	268	0	0	Same	309	0	0	Same	360	0	0	Same
Mercy Regional MC	Durango	MICU/SICU	1,019	0	0	Same	1,052	0	0	Same	1,071	1	0.8	Same
Montrose Memorial Hospital	Montrose	MICU/SICU	345	0	0	Same	341	0	0	Same	436	1	2.9	Same
North Colorado MC	Greeley	MICU/SICU	2,338	0	0	Same	2,506	0	0	Same	2,339	4	2.1	Same
North Suburban MC	Thornton	MICU/SICU	2,382	4	2.1	Same	2,191	0	0	Same	2,072	3	1.8	Same
Parker Adventist Hospital	Parker	MICU/SICU	1,475	1	0.8	Same	1,401	0	0	Same	1,458	0	0	Same
		MICU/SICU	1,579	3	1.7	Same	1,634	4	2.2	Same	2,457	2	0.9	Same
Parkview MC	Pueblo	Neuro ICU	1,147	1	1	Same	1,246	0	0	Same	1,030	1	1.1	Same
		MICU/SICU	Not yet operating				Not yet operating				389	0	0	Same
Platte Valley MC	Brighton	MICU	444	0	0	Same	313	0	0	Same	363	0	0	Same
Poudre Valley Hospital	Fort Collins	MICU/SICU	1,365	0	0	Same	1,446	0	0	Same	1,540	0	0	Same
Presbyterian St Lukes MC	Denver	MICU/SICU	2,215	2	0.8	Same	2,051	1	0.4	Same	1,767	1	0.5	Same
Rose MC	Denver	MICU/SICU	2,004	0	0	Same	1,851	1	0.5	Same	1,695	1	0.5	Same
San Luis Valley Regional MC	Alamosa	MICU/SICU	156	0	0	Same	235	0	0	Same	224	0	0	Same
Sky Ridge MC	Lone Tree	MICU/SICU	2,593	1	0.4	Same	2,302	0	0	Same	2,143	1	0.4	Same
Southwest Memorial Hospital	Cortez	MICU/SICU	119	0	0	Same	132	0	0	Same	61	0	0	Same
St Anthony Summit MC	Frisco	MICU/SICU	41	***	***	***	34	***	***	***	55	0	0	Same
St Marys Hospital	Grand	CSICU	5,869	1	0.2	Same	5,573	5	1.1	Same	6,471	2	0.4	Same

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	Junction													
Sterling Regional MC	Sterling	MICU/SICU	197	0	0	Same	120	0	0	Same	107	0	0	Same
Swedish MC	Englewood	MICU/SICU	4,657	7	1.9	Same	4,185	6	1.8	Same	5,489	6	3.5	Same
		NEURO ICU	2,165	3	1.5	Same	2,746	1	0.4	Same	992	2	2.2	Same
		Trauma CCU	720	2	2	Same	995	3	2.2	Same	427	1	1.7	Same
University of Colorado Hospital	Aurora	Burn ICU	1,263	5	1.4	Same	1,532	10	2.3	Worse	1,104	3	0.9	Same
		MICU/SICU	1,352	4	3	Same	1,575	3	1.9	Same	1,921	2	1	Same
		MICU	3,771	10	2.2	Worse	4,562	11	2	Worse	4,407	8	1.5	Same
		Neuro ICU	3,410	3	1	Same	4,643	9	2.2	Same	4,564	2	0.5	Same
		CSICU	Not yet operating				3,137	0	0	Same	4,082	6	1.8	Same
		SICU	4,445	8	1.6	Same	2,517	6	2.2	Same	1,965	1	0.5	Same
Vail Valley MC	Vail	MICU/SICU	87	0	0	Same	173	0	0	Same	128	0	0	Same
Valley View Hospital	Glenwood Springs	MICU/SICU	255	0	0	Same	295	0	0	Same	363	0	0	Same
Yampa Valley MC	Steamboat Springs	MICU/SICU	22	***	***	***	19	***	***	***	26	***	***	***

Note: CL=Central Line; SIR=standardized infection ratio, the ratio of observed to expected infections adjusted for procedure risk factors.

Note: MICU=Medical intensive care unit; SICU=Surgical intensive care unit; ICU= intensive care unit; CCU=Critical care unit; CSICU=Cardiothoracic surgical intensive care unit.

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

Infections for facilities with fewer than 50 central line days per year are suppressed to protect confidential health information. These facilities fulfilled reporting requirements.

National comparison based on data collected and reported by NHSN-participating hospitals from January-December, 2013.

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