



Colorado Department of Public Health and Environment

Health Facility Acquired Infections Disclosure Initiative

Semi-Annual Bulletin: Volume 1, No. 2, October 2008

Catheter Associated Bloodstream Infection Rates in

Colorado Neonatal Intensive Care Units

Introduction

This report was written to fulfill the requirements set forth in Colorado Revised Statute title 25, article 3, part 6, the Hospital-Acquired Infections Disclosure Act. The Act requires hospitals, hospital units, ambulatory surgery centers (ASCs) and dialysis treatment centers (DTCs) to report health facility acquired infections data as a condition of their state licensure. The Colorado Department of Public Health and Environment (the department) is the lead state agency administering the initiative. The department is required to produce semi-annual bulletins disclosing the results of the data collected.

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

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Data in this bulletin was submitted to the National Healthcare Safety Network (NHSN) by 17 Colorado hospitals that have neonatal intensive care units. The department uses NHSN to access the data and format the information for presentation to the general public. NHSN is utilized to handle all statistical analysis. The department depends on accurate information from reporting facilities and NHSN to produce these reports. The department does not perform data validation or audit facilities to ensure the data are complete. This report should be used as one of many quality evaluation tools and cannot, on its own, paint a complete picture of hospital care in Colorado.

Catheter associated bloodstream infections

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

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

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

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

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

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

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

Catheter associated bloodstream infections often lead to additional days in the hospital, which can be expensive for healthcare payers and healthcare organizations. Evidence suggests that reporting of infections may lead to better adherence to preventive practices and decrease medical complications or death.

Results

The two tables below show data submitted by the 17 Colorado hospitals that have level III neonatal care designation. The tables contain data from August 1, 2007 through July 31, 2008. The first table shows information on central line associated bloodstream infections in level III units, while the second displays data from level II/III combined units. Both tables contain results separated into the birth weight categories shown below:

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

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

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

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

1. Hospitals can have a statistically lower (better) infection rate than the national rate;

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

The national rate is the average rate for all hospitals reporting to NHSN in 2006. Hospital rates are compared to the national average to determine if it is statistically different. This statistical significance test shows the likelihood that the result did not happen by chance alone. In other words, there is a scientific reason why some hospitals have better or worse rates. For example, two hospitals may have zero infections, but if one hospital has a much greater number of catheter days that hospital may actually have a better infection rate than the national infection rate because of the large number of catheter days without any infection.

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

Cautions
















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

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

As infections are not the only adverse event that may happen to a consumer, it is important to weigh all factors in judging the quality of healthcare. Consumers should always consult with their doctor, hospital, family and friends before deciding where to receive care. Consumers should consider the experience of the facility, staff and other quality of care indicators in addition to the infection data below.

Table 1: Neonatal ICU Level III CLABSI Rates

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

Central Line Associated Bloodstream Infections (CLABSI) in the Neonatal Level III Intensive Care Unit						
Reporting Period: August 1, 2007-July 31, 2008 *						
Health Facility	Location	Central line days	CLABSI	CLABSI ** Rate	National Rate†	Comparison
Weight equal to or less than 1.65 pounds (≤750 grams)						
Centura Littleton Adventist Hospital	Littleton	19	----	----	6.4	----
Exempla St. Joseph Hospital	Denver	190	2	10.5	6.4	
Memorial Hospital Central	Colorado Springs	663	7	10.6	6.4	
Presbyterian St. Luke's Med. Ctr.	Denver	878	1	1.1	6.4	
St. Mary's Hospital	Grand Junction	28	----	----	6.4	----
The Children's Hospital	Denver	497	5	10.1	6.4	
Weight 1.66-2.2 pounds (751-1,000 grams)						
Centura Littleton Adventist Hospital	Littleton	32	----	----	4.4	----
Exempla St. Joseph Hospital	Denver	252	0	0.0	4.4	
Memorial Hospital Central	Colorado Springs	412	3	7.3	4.4	
Presbyterian St. Luke's Med. Ctr.	Denver	617	2	3.2	4.4	
St. Mary's Hospital	Grand Junction	67	0	0.0	4.4	
The Children's Hospital	Denver	734	8	10.9	4.4	
Weight 2.3-3.3 pounds (1,001-1,500 grams)						
Centura Littleton Adventist Hospital	Littleton	110	0	0.0	4.8	
Exempla St. Joseph Hospital	Denver	95	1	10.5	4.8	
Memorial Hospital Central	Colorado Springs	707	4	5.7	4.8	
Presbyterian St. Luke's Med. Ctr.	Denver	409	2	4.9	4.8	
St. Mary's Hospital	Grand Junction	77	0	0.0	4.8	
The Children's Hospital	Denver	491	3	6.1	4.8	



























Central Line Associated Bloodstream Infections (CLABSI) in the Neonatal Level III Intensive Care Unit						
Reporting Period: August 1, 2007-July 31, 2008 *						
Health Facility	Location	Central line days	CLABSI	CLABSI ** Rate	National Rate†	Comparison
Weight 3.4-5.5 pounds (1,501-2,500 grams)						
Centura Littleton Adventist Hospital	Littleton	11	----	----	4.2	----
Exempla St. Joseph Hospital	Denver	157	0	0.0	4.2	
Memorial Hospital Central	Colorado Springs	315	1	3.2	4.2	
Presbyterian St. Luke's Med. Ctr.	Denver	404	0	0.0	4.2	
St. Mary's Hospital	Grand Junction	125	0	0.0	4.2	
The Children's Hospital	Denver	1355	5	3.7	4.2	
Weight greater than 5.5 pounds (>2,500 grams)						
Centura Littleton Adventist Hospital	Littleton	4	----	----	3.1	----
Exempla St. Joseph Hospital	Denver	128	0	0.0	3.1	
Memorial Hospital Central	Colorado Springs	319	0	0.0	3.1	
Presbyterian St. Luke's Med. Ctr.	Denver	243	1	4.1	3.1	
St. Mary's Hospital	Grand Junction	175	0	0.0	3.1	
The Children's Hospital	Denver	1384	6	4.3	3.1	
*In January 2008, NHSN changed the criteria for laboratory confirmed bloodstream infections. National rates provided by NHSN are based on the criteria used before January 2008. Adjustments will be made to the data in order to compensate for criteria changes when new national rates become available. **Facility central line infection rate for NICU level and weight category. †National central line infection rate for NICU level and weight category calculated from NHSN participating hospitals in 2006. ----Infection data, for hospitals with less than 50 central line days in a 12 month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements.						
Statistically Better than national rate						
Statistically the Same as the national rate						
Statistically Worse than national rate						

Table 2: Neonatal ICU Level II/III CLABSI Rates

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

Central Line Associated Bloodstream Infections (CLABSI) in the Neonatal Level II/III Intensive Care Unit						
Reporting Period: August 1, 2007-July 31, 2008 *						
Health Facility	Location	Central line days	CLABSI	CLABSI ** Rate	National Rate†	Comparison
Weight equal to or less than 1.65 pounds (≤750 grams)						
Rose Med. Ctr.	Denver	83	0	0.0	5.9	
Swedish Med. Ctr.	Englewood	7	----	----	5.9	----
University of Colorado Hospital‡	Aurora	538	2	3.7	5.9	
Weight 1.66-2.2 pounds (751-1,000 grams)						
Centura Penrose St. Francis Health	Colorado Springs	60	0	0.0	5.2	
Denver Health Med. Ctr.	Denver	229	0	0.0	5.2	
Rose Med. Ctr.	Denver	74	0	0.0	5.2	
Swedish Med. Ctr.	Englewood	56	0	0.0	5.2	
University of Colorado Hospital‡	Aurora	178	0	0.0	5.2	
Weight 2.3-3.3 pounds (1,001-1,500 grams)						
Centura Avista Adventist Hospital	Louisville	21	----	----	3.4	----
Centura Penrose St. Francis Health	Colorado Springs	34	----	----	3.4	----
Denver Health Med. Ctr.	Denver	455	1	2.2	3.4	
Exempla Lutheran Med. Ctr.	Wheat Ridge	94	0	0.0	3.4	
Parker Adventist Hospital	Parker	10	----	----	3.4	----
Poudre Valley Hospital	Fort Collins	83	0	0.0	3.4	
Rose Med. Ctr.	Denver	47	----	----	3.4	----
Swedish Med. Ctr.	Englewood	32	----	----	3.4	----
University of Colorado Hospital‡	Aurora	491	2	4.1	3.4	

Central Line Associated Bloodstream Infections (CLABSI) in the Neonatal Level II/III Intensive Care Unit						
Reporting Period: August 1, 2007-July 31, 2008 *						
Health Facility	Location	Central line days	CLABSI	CLABSI ** Rate	National Rate†	Comparison
Weight 3.4-5.5 pounds (1,501-2,500 grams)						
Centura Avista Adventist Hospital	Louisville	9	----	----	2.4	----
Centura Penrose St. Francis Health	Colorado Springs	6	----	----	2.4	----
Denver Health Med. Ctr.	Denver	248	0	0.0	2.4	
Exempla Lutheran Med. Ctr.	Wheat Ridge	5	----	----	2.4	----
Parker Adventist Hospital	Parker	58	0	0.0	2.4	
Poudre Valley Hospital	Fort Collins	94	0	0.0	2.4	
Rose Med. Ctr.	Denver	48	----	----	2.4	----
Swedish Med. Ctr.	Englewood	17	----	----	2.4	----
University of Colorado Hospital‡	Aurora	205	1	4.9	2.4	
Weight greater than 5.5 pounds (>2,500 grams)						
Centura Penrose St. Francis Health	Colorado Springs	7	----	----	4.2	----
Denver Health Med. Ctr.	Denver	48	----	----	4.2	----
Parker Adventist Hospital	Parker	33	----	----	4.2	----
Poudre Valley Hospital	Fort Collins	62	0	0.0	4.2	
Rose Med. Ctr.	Denver	8	----	----	4.2	----
Swedish Med. Ctr.	Englewood	17	----	----	4.2	----
University of Colorado Hospital‡	Aurora	101	0	0.0	4.2	
<p>*In January 2008, NHSN changed the criteria for laboratory confirmed bloodstream infections. National rates provided by NHSN are based on the criteria used before January 2008. Adjustments will be made to the data in order to compensate for criteria changes when new national rates become available.</p> <p>**Facility central line infection rate for NICU level and weight category.</p> <p>†National central line infection rate for NICU level and weight category calculated from NHSN participating hospitals in 2006.</p> <p>‡Reporting period October 2007 through July 2008. This facility did not begin collecting NICU data until October 2007, following their move to the new facility.</p> <p>----Infection data, for hospitals with less than 50 central line days in a 12 month period are suppressed to protect confidential health information. These hospitals have met the reporting requirements.</p>						
						 Statistically Better than national rate  Statistically the Same as the national rate  Statistically Worse than national rate

Conclusion

This report shows the initial results from a new reporting system. The department and the Colorado Health Facility Acquired Infections Advisory Committee recommend users of these data not draw drastic conclusions from the limited information that is currently available. Facilities vary in the types of patients they treat, and a facility that treats a high volume of severely ill patients may have higher infection rates. It is important to note, initiatives involving new reporting systems require time to allow facilities to become familiar with the requirements and ensure the system is used correctly. The department believes that the disclosure initiative will ultimately help Colorado health facilities identify areas for improvement and result in fewer infections in the coming years. The department and its infection advisory committee are eager to continue this initiative and are committed to providing this valuable information to Colorado healthcare consumers.

For more information, please contact the patient safety initiatives program at:

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Or view detailed information on implementing the disclosure initiative, including the first annual report by visiting the patient safety initiatives Web page at:

<http://www.cdphe.state.co.us/hf/PatientSafety/index.html>