Catheter-Associated Bloodstream Infection Rates

Background

Catheter-associated bloodstream infections are primary bloodstream infections (BSI) that are associated with the presence of a central line within the 48-hour period before a BSI develops. 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 is a central vascular catheter inserted through the umbilical artery or vein in a neonate (i.e., a tube placed in the umbilical cord).

Central lines can be either permanent or temporary. Permanent lines are those that are tunneled and cuffed (a line that is tunneled under the skin to a separate exit site, where it emerges from underneath the skin and held in place by a cuff). Temporary lines are those that are not tunneled and not cuffed. Permanent lines are commonly used in LTACH patients and may have lower rates of infection than central lines inserted for temporary use. In Colorado, the data show that a majority of LTACHs are using temporary lines. Both types of lines are used to infuse fluids, administer medications and/or blood, or withdraw blood in patients.

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. Many of the central line-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.

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

A new analysis in this year's report is the comparison to the "historical data". For the central line- and umbilical catheter-associated bloodstream infection data collected, there are two to three years of data. The historical comparison calculates a Standardized Infection Ratio (or SIR) based on a facility specific infection rate from the previous year(s). An expected number of infections can be calculated based on previous infection rates and compared to the current year's number of infections. This allows for the comparison

of the current data to previous years to ascertain if a facility is doing better, worse or the same. (See Appendices F and G in the complete report for more information concerning the calculation and interpretation of an SIR.)

Long-Term Acute Care Hospitals

This section of the report focuses on central line-associated bloodstream infections (CLABSI) acquired in long-term acute care hospitals (LTACH). An LTACH is a specialty care hospital that cares for patients with complex medical conditions requiring intense, specialized treatment for a long period of time (an average length of stay 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. Long-term acute care hospitals began reporting data in August, 2008.

Results

Tables 17 and 18 below show facility specific data for CLABSI in long-term acute care hospitals for both temporary central lines and permanent central lines. The tables contain data from August 1, 2009 through July 31, 2010.

Each table lists all the LTACHs 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, comparison to the national infection rate, historical infection rate, and the comparison to the historical infection rate for that unit. The number of central line days is the total number of days a central line 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 CCU are:

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

Table 17: Long-Term Acute Care Hospital CLABSI Rates for Permanent Lines, 2009-2010

Central Line Associated Bloodstream Infections (CLABSI) in
Long-Term Acute Care Hospitals (LTACH), Permanent (Tunneled) Lines
Reporting Period: August 1, 2009-July 31, 2010.

Health Facility and Region		Permanent Central Line Days	CLABSI	CLABSI Rate	National Comparison (National Rate = 1.6)	Historical Rate	Historical Comparison
Colorado Acute Long Term Hospital	**Denver**	430	0	0.0	Same	0.0	***
Craig Hospital	**Englewood**	231	0	0.0	Same	0.0	***
Kindred Hospital	**Denver**	991	2	2.0	Same	1.0	Same
Northern Colorado Long Term Acute Hospital	**Johnstown**	127	0	0.0	Same	***	***
Select Long Term Care Hospital	**Colorado Springs**	3,748	3	0.8	Same	1.0	Same
Select Specialty Hospital South Campus	**Denver**	105	0	0.0	Same	***	***
Select Specialty Hospital	**Denver**	70	0	0.0	Same	***	***
Triumph Acute Long Term Care Hospital of Aurora	**Aurora**	708	0	0.0	Same	***	***
Vibra Long Term Acute Care Hospital	**Thornton**	777	0	0.0	Better	0.0	***

Facility permanent (tunneled) central line infection rates are per 1,000 permanent central line-days.
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).
Historical comparison based on data collected and reported for a given facility from August 1, 2008-July 31, 2009.
*** 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 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 Initiatives Program, Colorado Department of Public Health and Environment.

Table 18: Long-Term Acute Care Hospital CLABSI Rates for Temporary Lines, 2009-2010

Central Line Associated Bloodstream Infections (CLABSI) in
Long-Term Acute Care Hospital (LTACH), Temporary (Non-Tunneled) Lines
Reporting Period: August 1, 2009-July 31, 2010.

Health Facility and Region		Temporary Central Line Days	CLABSI	CLABSI Rate	National Comparison (National Rate = 1.7)	Historical Rate	Historical Comparison
Colorado Acute Long Term Hospital	**Denver**	5,545	7	1.3	Same	3.0	Better
Craig Hospital	**Englewood**	5,442	1	0.2	Better	0.0	***
Kindred Hospital	**Denver**	5,122	12	2.3	Same	2.8	Same
Northern Colorado Long Term Acute Hospital	**Johnstown**	4,559	12	2.6	Same	2.3	Same
Select Long Term Care Hospital	**Colorado Springs**	139	0	0.0	Same	4.1	Same
Select Specialty Hospital South Campus	**Denver**	3,991	4	1.0	Same	1.6	Same
Select Specialty Hospital	**Denver**	4,370	3	0.7	Same	1.0	Same
Triumph Acute Long Term Care Hospital of Aurora	**Aurora**	3,733	8	2.1	Same	1.7	Same
Vibra Long Term Acute Care Hospital	**Thornton**	4,649	1	0.2	Better	1.0	Same

Facility temporary (non-tunneled) central line infection rates are per 1,000 temporary central line-days.
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).
Historical comparison based on data collected and reported for a given facility from August 1, 2008-July 31, 2009.
*** 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 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 Initiatives Program, Colorado Department of Public Health and Environment.