

Central Line Associated Bloodstream Infection (CLABSI) Rates: Technical Guide

This technical guide was developed to provide more detail about Vermont's public reporting of central line associated blood stream infection rates.

What is a Central Line Associated Bloodstream Infection (CLABSI)?

The CDC defines a central line associated bloodstream infection is an infection in a patient that had a central line inserted within the 48-hour period before the onset of infection.

Who is required to report data?

The CDC defines an Intensive Care Unit as a nursing care area in which at least 80% of the patients require intensive observation, diagnosis, and therapeutic procedures. Vermont hospitals with an Intensive Care Unit or Special Care Unit (or a portion of such a unit) meeting this definition are required to report CLABSI data.

How are data reported?

Data are reported in the CDC National Healthcare Safety Network (NHSN) System. The data are entered into the NHSN system by designated hospital staff. The NHSN System allows for data extraction and analysis, including benchmarking results against peer group and national data. The CDC excludes hospitals with fewer than 50 central line days a year from their benchmark calculations. Vermont excluded hospitals reporting fewer than 50 central line days during the twelve month reporting period from this public report due to concerns about small numbers.

How is a CLABSI rate calculated and what does it mean?

A CLABSI rate is reported as a rate per 1000 central line days and is calculated by dividing the number of CLABSI by the number of central line days and multiplying the result by 1000. Lower rates are better.

For example, if an ICU had 5 central line infections and 100 central line days, the CLABSI rate is calculated as follows: $5/100 \times 1,000 = 50$ central line infections per 1,000 central line days.

How is the Percent of Patient Days with a Central Line calculated and what does it mean?

The Percent of Patient Days with a Central Line measures the proportion of total patient days in the ICU in which central lines were used. For this report, the percent of patient days with a central line is calculated by dividing the number of central line days by the number of patient days and multiplying the result by 100. Higher percentages may be associated with the patients' severity of illness and level of patient care required.

For example, if an ICU had 500 central line days and 1,000 patient days, the percent of patient days with a central line is calculated as follows: $500/1,000 = 0.5 \times 100 = 50\%$ of the patient days in the ICU had central lines in place.

Both of these calculations are reported separately for different types of ICUs or Special Care Units.

How do I interpret the comparison to hospitals reporting to NHSN?

The comparison is based on significance testing. Three categories are used to summarize how each hospital compares to the Average Central Line Associated Bloodstream (CLAB) Infection Rate for all hospitals in the U.S. reporting central line data to NHSN:

- The infection rate is lower (better) than the average CLAB infection rate for hospitals reporting to NHSN;
- The infection rate is similar to the average CLAB infection rate for hospitals reporting to NHSN;
- The infection rate is higher (worse) than the average CLAB infection rate for hospitals reporting to NHSN.

The following link leads to an article from the Centers for Disease Control and Prevention that contains NHSN national data from 2006:

<http://www.cdc.gov/ncidod/dhqp/pdf/nhsn/2008NHSNReport.pdf>

What is significance testing?

Tests of significance are needed to tell us whether the number of infections in a hospital is unusually high or low relative to the number of infections in a reference group (all NHSN hospitals reporting the same procedure).

One way to do this is using a p-value. The p-value is a probability that weighs the evidence for determining whether an infection rate is unusually high or low in comparison to the reference group. If the p-value is small (less than .05), there is sufficient evidence to suggest that the infection rates are either higher or lower than the average for all NHSN hospitals. If the p-value is greater than .05, then there is not enough evidence to conclude the hospital's infection rate is different from the average for all NHSN hospitals.