INFECTION REPORTING FOR
KNEE REPLACEMENT SURGERIES

A surgical site infection is an infection that occurs after surgery in the part of the body where the surgery took place. Surgical site infections can sometimes be superficial infections involving the skin only. Other surgical site infections are more serious and can involve tissues under the skin, organs, or implanted material. This report presents all deep incisional primary and organ/space healthcare-associated infections (HAIs) at the surgical site for knee prosthesis surgeries[1] that were identified during the initial hospital stay, or if the patient returned for inpatient, emergency room, or observation care to the same hospital within 90 days after the surgery.

Any Vermont hospital performing knee replacements is required to report data to the CDC National Healthcare Safety Network (NHSN) System. One way to tell whether a hospital is doing a good job is to compare the number of infections that occurred to the number of infections predicted based on previous years of reported data (national baseline). . The standardized infection ratio (SIR)[2] is a summary measure that can be used to make these comparisons and track infections over time. This report compares the number of HAIs following knee replacement surgery among Vermont hospitals to those predicted in the same time period based on the national baseline.

In some Vermont hospitals, too few surgeries were performed to calculate a reliable rate, thus preventing calculation of a SIR. Only Vermont hospitals with sufficient numbers of knee replacement surgeries are presented in the table below, however the total number of knee replacement surgeries and associated infections for all hospitals are presented on the following page.

When choosing where to get your health care, the number of infections reported by a hospital is only one consideration. The advice of your physician, the hospital's and specialist's experience with the type of care you need, and other factors unique to your situation should be considered as well.

Hospital	Hospital performance October 2014 – September 2015
University of Vermont Medical Center	No different than the U.S. national baseline
Rutland Regional Medical Center	No different than U.S. national baseline
Vermont Total	No different than U.S. national baseline

---

[1] Infections are reported for knee replacements (i.e., partial and total replacements and both scheduled and traumatic replacements). The ICD-9-CM codes for this procedure are: 00.80-00.84, 81.54 and 81.55.

[2] The SIR is calculated by dividing the number of observed infections by the number of "expected or predicted". For each surgery, the number of predicted infections is determined using logistic regression modeling using the national data as a baseline reference population. The SIR is only calculated if the number of "predicted" HAIs exceeds 1.0. When the number of predicted infections is less than 1.0, the number of surgeries performed is too low to calculate a precise SIR and comparative statistics. The SIR adjusts for patients of varying risk within each facility using a logistic regression model that includes patient and clinical characteristics that have been found to be significantly associated with differences in infection incidence. For more information go to: http://www.cdc.gov/HAI/progress-report/index.html.

Infections after Knee Replacement Surgery – October 1, 2014 through September 30, 2015

Hospital[3]	Number of Surgeries	Number of Infections	Standardized Infection Ratio (SIR)[4]	95% Confidence Interval (CI) for SIR[5]	Hospital performance compared to NHSN national baseline
Brattleboro Memorial Hospital	155	1	NA		
Central Vermont Medical Center	67	0	NA		
Copley Hospital	171	0	NA		
Gifford Medical Center	33	0	NA		
Mt. Ascutney Hospital & Health Center	0	0	NA		
North Country Hospital	23	0	NA		
Northeastern Vermont Regional Hospital	48	0	NA		
Northwestern Medical Center	63	0	NA		
Porter Hospital	64	0	NA		
Rutland Regional Medical Center	330	3	1.797	0.457, 4.890	No different
Southwestern Vermont Medical Center	69	1	NA		
Springfield Hospital	61	0	NA		
University of Vermont Medical Center	392	1	0.356	0.018, 1.756	No different
Vermont Total	**1,476**	**6**	**0.713**	**0.289, 1.483**	No different

NA (Not applicable): Too few surgeries were performed to calculate a reliable SIR. When the SIR cannot be calculated, a comparison to national data is not possible.
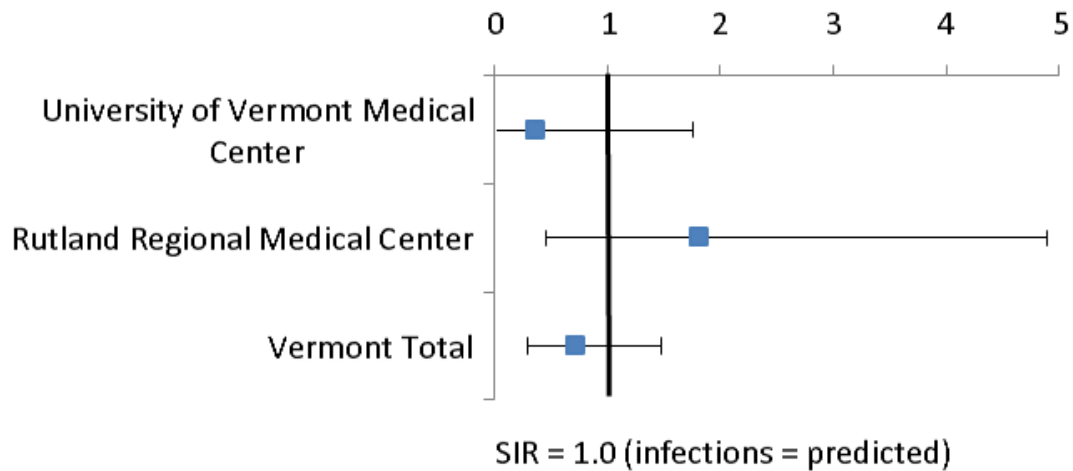
---

[3] Grace Cottage Hospital is excluded because they do not perform this surgery.

[4] A SIR equal to 1.0 means the observed number of infections is equal to the number of infections one would predict based on national experience; A SIR higher than 1.0 means that the infection rate is higher (worse) than one would predict based on national experience; A SIR less than 1.0 means the infection rate is lower (better) than one would predict based on the national experience.

[5] To assess whether the difference between the observed number of infections is significantly different from the predicted number of infections, a 95% confidence interval for the SIR is calculated. The confidence interval for a hospital's SIR is the range of possible SIRs within which there is 95% confidence that the real SIR for that hospital lies, given the number of infections and procedures that were observed for that hospital.

- If the 95% confidence interval contains the value of 1.0, the observed number of infections will be considered "similar" (not significantly different) from the expected.
- If the SIR is less than 1.0 and the 95% confidence interval does not include 1.0, the hospital's infections are significantly "lower" than expected.
- If the SIR is greater than 1.0 and the 95% confidence interval does not include 1.0, the hospital's infections are significantly "higher" than expected.

Infections after Knee Replacement Surgery – October 1, 2014 through September 30, 2015
SIR[6] and 95% confidence intervals[7] (lower values are better)

SIR = 1.0 (infections = predicted)

---

[6] A SIR equal to 1.0 means the observed number of infections is equal to the number of infections one would predict based on national experience; A SIR higher than 1.0 means that the infection rate is higher (worse) than one would predict based on national experience; A SIR less than 1.0 means the infection rate is lower (better) than one would predict based on the national experience.

[7] To assess whether the difference between the observed number of infections is significantly different from the predicted number of infections, a 95% confidence interval for the SIR is calculated. The confidence interval for a hospital's SIR is the range of possible SIRs within which there is 95% confidence that the real SIR for that hospital lies, given the number of infections and procedures that were observed for that hospital.

- If the 95% confidence interval contains the value of 1.0, the observed number of infections will be considered "similar" (not significantly different) from the expected.
- If the SIR is less than 1.0 and the 95% confidence interval does not include 1.0, the hospital's infections are significantly "lower" than expected.
- If the SIR is greater than 1.0 and the 95% confidence interval does not include 1.0, the hospital's infections are significantly "higher" than expected.

May 2016 - Report was compiled by the Vermont Program for Quality in Health Care, Inc.