



# Department of Veterans Affairs Office of Inspector General

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## Healthcare Inspection

## Surgical Care Improvement Project

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## **Executive Summary**

The VA Office of Inspector General evaluated the extent to which Veterans Health Administration (VHA) clinicians implemented strategies designed to prevent or reduce the incidence of surgical infections. Surgical infections represent significant patient safety risks because they contribute to increased morbidity and mortality rates and increased lengths of hospital stays and healthcare costs. We conducted the evaluation during 21 Combined Assessment Program (CAP) reviews from May 1 – October, 2007.

We selected the following Surgical Care Improvement Project performance measures for the focus of this review: (1) timely administration of prophylactic antibiotics, (2) timely discontinuation of prophylactic antibiotics, and (3) for patients who had cardiac surgery performed, controlled serum glucose levels during their first 2 days postoperatively.

We concluded that all facilities evaluated during the CAP reviews implemented strategies to prevent or reduce the incidence of surgical infections. We found that clinical managers tracked their performance measure compliance with VHA's established target goals. For those measures that were below VHA's established goals, managers' implemented appropriate action plans to improve performance.

We made no recommendations.



**DEPARTMENT OF VETERANS AFFAIRS**  
**Office of Inspector General**  
**Washington, DC 20420**

**TO:** Under Secretary for Health (10)

**SUBJECT:** Healthcare Inspection – Surgical Care Improvement Project

## **Purpose**

The VA Office of Inspector General (OIG) Office of Healthcare Inspections evaluated the extent that Veteran Health Administration (VHA) clinicians implemented strategies designed to prevent or reduce the incidence of surgical infections.

## **Background**

Surgical infections represent a significant patient safety risk because they contribute to increased morbidity and mortality rates; also, they are costly to health care systems because they contribute to increased lengths of hospital stays and health care costs.<sup>1</sup> They also account for approximately 17 percent of all nosocomial (hospital-acquired) infections.<sup>2</sup>

There are multiple risk factors that contribute to the development of surgical infections, such as patient specific or surgery related factors. Patient factors include increased serum glucose levels, existing infections, diabetes or other chronic illnesses, malnutrition, and age. Surgical factors include the surgical scrub techniques used by the surgical teams, the antiseptic preparation of patients' skin, and the duration of the surgeries.<sup>3</sup>

The Joint Commission (JC) and the Centers for Medicare & Medicaid Services (CMS) began working together in 2001 to develop common healthcare performance measures. In 2003, the JC and CMS developed the *Specifications Manual for National Hospital*

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<sup>1</sup> Bratzler, D., Houck, P., "Antimicrobial Prophylaxis for Surgery: An advisory statement from the National Surgical Infection Prevention Project," *Clinical Infectious Diseases*, 38:1706–1715, June 15, 2004.

<sup>2</sup> Perencevich, E. N., Sands, K.E., Cosgrove, S.W., et al., "Health and Economic Impact of Surgical Site Infections Diagnosed after Hospital Discharge", *Emerging Infectious Diseases*, Vol. 9, No. 2, February 2003, retrieved July 12, 2006, from <http://cdc.gov/ncidod/EID/vol9no2/02-0232.htm>.

<sup>3</sup> Cheadle, W. G., "Risk Factors for Surgical Site Infections," *Surgical Infections*, Vol. 7, (Supp 1), pp. S7–S11, 2006.

*Quality Measures*, which defined health care measure specifications used by both organizations. The surgical infection prevention measures were included in the manual, and the goal was to have identical measure specifications aimed at improving healthcare delivery processes.<sup>4</sup>

In 2005, VHA incorporated the JC and CMS surgical infection prevention measures into its Performance Measurement Program (PMP) to improve surgical patient outcomes. These measures were categorized under the Surgical Care Improvement Project (SCIP) and were given corresponding VHA target goals for performance measurement. VHA's External Peer Review Program analyzed data from quarterly medical record reviews to determine each facility's compliance with established target goals for the measures in the PMP. To ensure managerial and clinical responsibility, the measures (which include the SCIP measures) are also included in the Executive Career Field Performance Plan as critical elements.

We selected the following SCIP performance measures for the focus of this review:

1. Timely administration of prophylactic antibiotics: Literature supports that the administration of preoperative prophylactic antibiotics reduces postoperative surgical infections and morbidity and mortality rates associated with them. The use of prophylactic antibiotics has also been associated with shorter lengths of hospital stays and reduced hospital costs. The goal of antimicrobial prophylaxis is to achieve serum and tissue drug levels for the duration of the operation that will protect the patient against organisms likely encountered while the wound is open and susceptible to infection. For optimum effect, antibiotics should be administered 1–2 hours prior to the initial incision, depending on the antibiotic.<sup>5</sup>
2. Timely discontinuation of prophylactic antibiotics: Continued use of antibiotics for more than a few hours after wound closure may not be necessary and may increase the risk of patients developing antimicrobial resistant pathogens and clostridium difficile (bacteria that cause gastrointestinal infections).<sup>6</sup>
3. Controlled serum glucose levels for cardiac surgery: Hyperglycemia (increased blood sugar levels) in the postoperative period is associated with an increased rate of infection for patients diagnosed with diabetes, as well as for patients not diagnosed with diabetes. Hyperglycemia interferes with phagocytic and bactericidal activity of the immune system, which increases the risk of nosocomial infections.<sup>7</sup> Additionally,

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<sup>4</sup> Joint Commission. *Specification Manual for National Hospital Quality Measures*, retrieved August 14, 2006, from <http://www.jointcommission.org/PerformanceMeasurement>.

<sup>5</sup> Bratzler, D., pp.1707–1708.

<sup>6</sup> Department of Veterans Affairs, Office of Quality Improvement, *FY 2007 QI Technical Manual for the VHA Performance Measure System*: Measure 14, Surgical Care Improvement Project (SCIP), p. 8, retrieved from <http://vaww.oqp.med.va.gov>.

<sup>7</sup> Grey, N.J, and Perdriet, G.A., *Endocrine Practice*, March–April, 2004, 10, Suppl.2: 46–47.

hyperglycemia increases the risk of infection for cardiac surgery patients. Controlling patients' glycemic levels may lower the risk of infection and decrease hospital costs.<sup>8</sup>

4. Controlled core body temperature for colorectal surgery: At the beginning of this review, this measure was part of VHA's PMP; therefore, it was included as part of our evaluation. However, in August 2007 (about mid-way through the review), VHA discontinued this as a performance measure and changed it to a supporting indicator. This was done because the National Quality Forum (NQF)<sup>9</sup> did not endorse the measure. NQF reported that there was insufficient evidence in the literature to support that *postoperative* normothermia, the focus of the VHA performance measure, decreased surgical infections. NQF reported that the supporting evidence in the literature focused on *intraoperative* normothermia and not postoperative normothermia. Based on the NQF decision not to endorse this measure, JC no longer requires hospitals to collect and submit this data;<sup>10</sup> consequently, we excluded the data from this report.

## Scope and Methodology

We conducted the evaluation during 21 Combined Assessment Program (CAP) reviews from May 1–October 31, 2007, at VHA medical facilities that perform surgery. We evaluated the facilities compliance with VHA's established target goals for the selected measures in at least 2 of the most recent 4 quarters prior to the CAP reviews; we also analyzed each facility's action plans when performance scores were below VHA established target goals for acceptable performance.

Additionally, we reviewed the medical records for patients who had cardiac, colorectal, vascular, orthopedic (hip and knee), and hysterectomy surgeries for a total of 572 patient records. We randomly selected patients who had surgery during the most recent completed quarter before the date of the CAP review. Each facility provided us with a list of patients who fulfilled the criteria for our review. All 572 medical records were reviewed for timely administration and discontinuation of prophylactic antibiotics. Medical records for patients who had cardiac surgery were also reviewed for glycemic control during the immediate 2 days postoperatively. We reviewed medical records to determine if:

- Clinicians administered prophylactic antibiotics preoperatively within the appropriate timeframe of 1–2 hours prior to the first incision, depending on the antibiotic administered.

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<sup>8</sup> Department of Veterans Affairs, Office of Quality Improvement. *FY 2007 Q1 Technical Manual for the VHA Performance Measure System*: Measure 14, Surgical Care Improvement Project (SCIP), p. 9.

<sup>9</sup> NQF is a not for profit membership organization created to develop and implement a national strategy for health care quality measurement and reporting. Members of NQF work to promote a common system for measuring health care quality. Retrieved 12/19/2007 from <http://216.122.138.39/about/>.

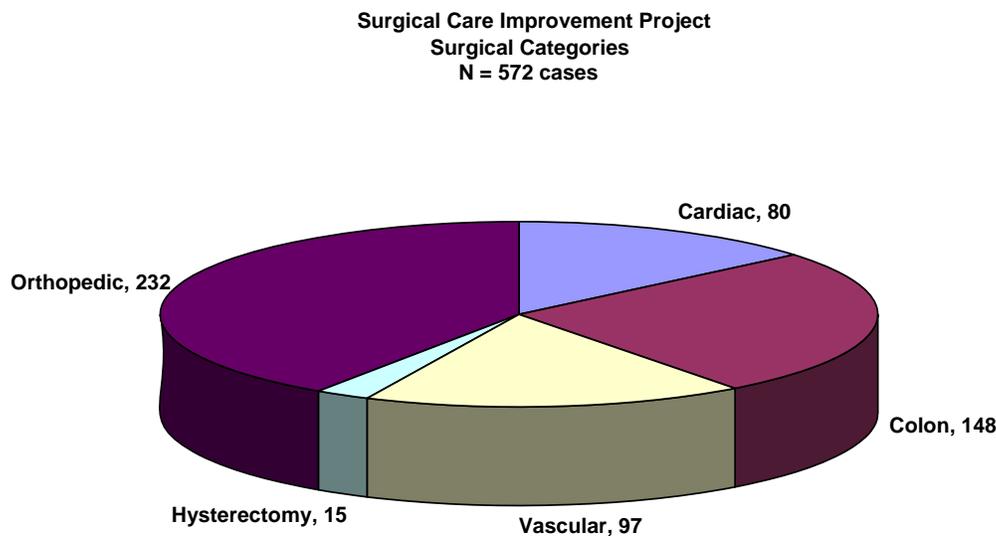
<sup>10</sup> Joint Commission: *2008 ORYX Performance Reporting Requirements for Hospitals and Guidelines for Measure Selections*, retrieved from <http://www.jointcommission.org>.

- Clinicians discontinued prophylactic antibiotics post-operatively within the appropriate timeframe of 24–48 hours after wound closure, depending on the surgical procedure.
- Clinicians controlled postoperative serum glycemic levels for 2 postoperative days for patients having cardiac surgery.

We conducted the inspection in accordance with the *Quality Standards for Inspections* published by the President’s Council on Integrity and Efficiency.

## Results and Conclusions

Six surgical categories were included in the 572 medical records reviewed. The sample size for each surgical category is as follows: cardiac surgeries, 80 (14 percent); colorectal surgeries, 148 (26 percent); orthopedic surgeries (hip and knee) 232 (41 percent), vascular surgeries, 97 (17 percent); and hysterectomy surgeries 15 (3 percent).<sup>11</sup> The sample size for each surgical category is displayed below.



<sup>11</sup> Percentages were rounded up to have whole percentage numbers, consequently the total percentage for all of the surgical categories is higher than 100 percent.

## 1. Timely Administration of Prophylactic Antibiotics

VHA's criterion for administering preoperative prophylactic antibiotics is 1–2 hours before the first surgical incision, depending on the antibiotic administered. Vancomycin and a class of antibiotics grouped under the name of fluoroquinolones should be administered 2 hours prior to the first incision to prevent antibiotic-associated reactions. All other antibiotics should be administered 1 hour prior to the first surgical incision. Of the 21 facilities reviewed, 17 (81 percent) met VHA's established goal (90 percent of patients receiving antibiotics within the appropriate timeframes) in at least 2 of the most recent 4 quarters evaluated during the CAP reviews. Of the four facilities that did not meet the established goal, clinical managers had implemented action plans to improve their performance for this measure. At the time of the CAP reviews, three of the four facilities' performance scores demonstrated improvement.

Our medical record review also showed that of the 572 patients in our sample, 560 (98 percent) were administered preoperative prophylactic antibiotics within appropriate time frames.

## 2. Timely Discontinuation of Prophylactic Antibiotics

The timeframe defined by VHA for discontinuation of antibiotics for orthopedic, colorectal, vascular, and hysterectomy surgeries is 24 hours after surgery; the timeframe for cardiac surgery is up to 48 hours after surgery.<sup>12</sup> Of the 21 facilities reviewed, only 6 (29 percent) met VHA's established goal (87 percent of patients having antibiotics discontinued within 24–48 hours after closure of the incision) in at least 2 of the most recent 4 quarters evaluated during the CAP reviews. Of the 15 facilities that did not meet VHA's established goal, clinical managers had implemented action plans to improve their performance for this measure. At the time of the CAP reviews, 12 facilities' performance scores demonstrated improvement.

We reviewed medical records to determine if antibiotics were discontinued within the appropriate timeframes for all 572 patients. Of the 572 patients, we found that clinicians had not ordered antibiotics for 4 patients; our review could not determine why antibiotics were not ordered for 3 of the 4 cases. Therefore, these patients were eliminated from our sample, leaving a sample size of 568 patients. Our review showed that 547 (96 percent) of the 568 patients either had their antibiotics discontinued within the appropriate timeframes or had documented clinical reasons why the antibiotics were not discontinued.

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<sup>12</sup>According to the Society of Thoracic Surgeons practice guidelines, optimal practice for the duration of postoperative antibiotics is for 48 hours or less. Edwards, F. H., Engelman, M.R., Houck, P., et al., "The Society of Thoracic Surgeons Practice Guideline Series: Antibiotic Prophylaxis in Cardiac Surgery, Part I: Duration", *The Annals of Thoracic Surgery*, Vol. 81, pp. 387–404, 2006. Retrieved from [www.sts.org/section/resource/practiceguidelines/antibioticguideline](http://www.sts.org/section/resource/practiceguidelines/antibioticguideline)

### 3. Controlled Serum Glucose Levels

VHA's definition for controlled serum glucose is a glucose level of less than or equal to 200 milligrams/deciliter (mg/dL) for postoperative day (POD) 1 and POD 2. Nine facilities in our review sample performed cardiac surgeries. Of the 9 facilities, 7 (78 percent) met VHA's established goal (90 percent of patients with controlled serum glucose levels on both PODs). At the two facilities that did not meet VHA's target goal for this measure, clinical managers had implemented action plans to improve performance. Because VHA did not implement this performance measure until quarter 1 of fiscal year 2007, not enough time had elapsed for these two facilities to determine the efficacy of their action plans at the time of our CAP reviews.

We reviewed medical records for 80 patients who had cardiac surgery performed at the 9 facilities to determine if serum glucose levels were obtained and if any patients developed hyperglycemia on the first and/or second POD. Our review showed that all 80 patients had their serum glucose levels determined on both postoperative days. On POD 1, eight patients had serum glucose levels above 200 mg/dL; and on POD 2, two patients had serum glucose levels above 200 mg/dL. For those patients with glucose levels above target, clinicians implemented interventions to lower their serum glucose levels.

### Conclusion

We concluded that all 21 facilities reviewed implemented strategies to reduce or prevent the incidence of surgical infections. We also found that clinical managers tracked their performance measure scores. For those measures below VHA's established goals, they had implemented appropriate action plans to improve their performance. Additionally, based on NQF's conclusion that there was insufficient evidence in the literature to support that postoperative normothermia decreased the incidence of surgical infections, we excluded the data that represented controlled core body temperature for colorectal surgery patients from the report.

We made no recommendations.

The Under Secretary for Health agreed with the findings and conclusions. (See Appendix A, pages 6–7 for the full text of the Under Secretary's comments.)

*(original signed by Dana Moore, PhD  
Deputy Assistant Inspector General  
for Healthcare Inspection for:)*

**JOHN D. DAIGH, JR., M.D.**  
Assistant Inspector General for  
Healthcare Inspection

## Under Secretary for Health Comments

**Department of  
Veterans Affairs**

**Memorandum**

**Date:** March 19, 2008

**From:** Under Secretary for Health (10)

**Subject:** OIG Report: **Healthcare Inspection - Surgical Care Improvement Project**, Project No. 2007-00773-HI-0268/WebCIMS 399323

**To:** Assistant Inspector General for Healthcare Inspections (54)

1. I have reviewed the findings from this focused review and am very pleased to note that all 21 facilities reviewed during your CAP visits had effectively implemented successful strategies to reduce or prevent the incidence of surgical infections, including tracking of performance measure scores and initiating appropriate corrective actions, as necessary. These findings reflect a strong national collaborative effort among surgical, anesthesia, quality improvement and many other excellent clinical leaders in all of our medical centers. I personally commend these individuals.

2. While VHA is justifiably proud of our high performance and the significant improvement that has been achieved in this important quality oversight measure, we also recognize that ongoing efforts must be continually strengthened to achieve the high goals we have targeted in minimizing surgical infections. Your findings reflect VHA's commitment to help reduce such clinical complications through the use of evidence-based process and surgical outcome measures.

3. Thank you for the opportunity to respond to this report. If additional information is required, please contact Margaret M. Seleski, Director, Management Review Service (10B5), at 565-7638.

*(original signed by:)*

Michael J. Kussman, MD, MS, MACP

## OIG Contact and Staff Acknowledgments

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