Complete Summary

TITLE

Surgical infection prevention: percent of patients who received prophylactic antibiotics within 1 hour prior to surgical incision.

SOURCE(S)

Centers for Medicare and Medicaid Services (CMS). 7th statement of work (SOW). Quality of care measure specifications: Surgical infection prevention (SIP). Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); 2002 Aug 1. Various p.

Brief Abstract

DESCRIPTION

Surgical patients who received prophylactic antibiotics within 1 hour prior to surgical incision. Patients who are allergic to beta-lactam antibiotics and received vancomycin for prophylactic antibiotics should have the antibiotics administered within 2 hours prior to surgical incision. Due to the longer infusion time required for vancomycin, it is acceptable to start this antibiotic within 2 hours prior to incision time.

RATIONALE

A goal of prophylaxis with antibiotics is to establish bactericidal tissue and serum levels at the time of skin incision. Studies performed in the 1960's and 1970's demonstrated that a common reason for failure of prophylaxis was delay of antibiotic administration until after the operation. In a study of 2,847 surgery patients at Latter-Day Saints (LDS) Hospital in Salt Lake City, it was found that the lowest incidence of post-operative infection was associated with antibiotic administration during the one hour prior to surgery.

Opportunities to improve care have been demonstrated and timely administration has been recommended. Hospital systems are often the cause of improper antibiotic timing.

PRIMARY CLINICAL COMPONENT

Surgical infection prevention; prophylactic antibiotic administration

DENOMINATOR DESCRIPTION

All selected surgical patients (see the related "Denominator Inclusions/Exclusions" field in the Complete Summary)

NUMERATOR DESCRIPTION

Number of surgical patients who received prophylactic antibiotics within 1 hour of surgical incision (2 hours if receiving vancomycin due to beta-lactam allergy)

Evidence Supporting the Measure

PRIMARY MEASURE DOMAIN

Process

SECONDARY MEASURE DOMAIN

Not applicable

EVIDENCE SUPPORTING THE MEASURE

A clinical practice guideline or other peer-reviewed synthesis of the clinical evidence
One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

NATIONAL GUIDELINE CLEARINGHOUSE LINK

- Guideline for prevention of surgical site infection, 1999.
- ASHP therapeutic guidelines on antimicrobial prophylaxis in surgery.

Evidence Supporting Need for the Measure

NEED FOR THE MEASURE

Overall poor quality for the performance measured
Wide variation in quality for the performance measured

EVIDENCE SUPPORTING NEED FOR THE MEASURE

Burke JP. Maximizing appropriate antibiotic prophylaxis for surgical patients: an update from LDS Hospital, Salt Lake City. Clin Infect Dis 2001 Sep 1;33 Suppl 2:S78-83. [41 references] PubMed

Classen DC, Evans RS, Pestotnik SL, Horn SD, Menlove RL, Burke JP. The timing of prophylactic administration of antibiotics and the risk of surgical-wound infection. N Engl J Med 1992 Jan 30;326(5):281-6. PubMed

Finkelstein R, Reinhertz G, Embom A. Surveillance of the use of antibiotic prophylaxis in surgery. Isr J Med Sci 1996 Nov;32(11):1093-7. PubMed

Silver A, Eichorn A, Kral J, Pickett G, Barie P, Pryor V, Dearie MB. Timeliness and use of antibiotic prophylaxis in selected inpatient surgical procedures. The Antibiotic Prophylaxis Study Group. Am J Surg 1996 Jun;171(6):548-52. PubMed

State of Use of the Measure

STATE OF USE

Current routine use

CURRENT USE

Collaborative inter-organizational quality improvement
Internal quality improvement

Application of Measure in its Current Use

CARE SETTING

Hospitals

PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Measure is not provider specific

LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Single Health Care Delivery Organizations

TARGET POPULATION AGE

Unspecified

TARGET POPULATION GENDER

Either male or female

STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

Characteristics of the Primary Clinical Component

INCIDENCE/PREVALENCE

See "Burden of Illness" field.

ASSOCIATION WITH VULNERABLE POPULATIONS

Unspecified

BURDEN OF ILLNESS

Surgical site infections occur in 2-5% of clean extra-abdominal surgeries and up to 20% of intra-abdominal surgeries. Each infection is estimated to increase a hospital stay by an average of 7 days and add over $3,000 in charges (1992 data). Patients who develop surgical site infections are sixty percent more likely to spend time in an ICU, five times more likely to be readmitted to the hospital and have twice the incidence of mortality. Despite advances in infection control practices, surgical site infections remain a substantial cause of morbidity and mortality among hospitalized patients. Studies indicate that appropriate preoperative administration of antibiotics is effective in preventing infection. Systemic and process changes that promote compliance with established guidelines and standards can decrease infectious morbidity.

EVIDENCE FOR BURDEN OF ILLNESS

Auerbach AD. Prevention of surgical site infections. In: University of California at San Francisco (USCF) Stanford University Evidence-based Practice Center. Making health care safer: a critical analysis of patient safety practices. Online ed. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2002. p. 221-230. (Evidence Report/Technology Assessment; no. 43).

Delgado-Rodriguez M, Sillero-Arenas M, Medina-Cuadros M, Martinez-Gallego G. Nosocomial infections in surgical patients: comparison of two measures of intrinsic patient risk. Infect Control Hosp Epidemiol 1997 Jan;18(1):19-23. PubMed

Horan TC, Culver DH, Gaynes RP, Jarvis WR, Edwards JR, Reid CR. Nosocomial infections in surgical patients in the United States, January 1986-June 1992. National Nosocomial Infections Surveillance (NNIS) System. Infect Control Hosp Epidemiol 1993 Feb;14(2):73-80. PubMed

Kirkland KB, Briggs JP, Trivette SL, Wilkinson WE, Sexton DJ. The impact of surgical-site infections in the 1990s: attributable mortality, excess length of hospitalization, and extra costs. Infect Control Hosp Epidemiol 1999 Nov;20(11):725-30. PubMed

Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR. Guideline for prevention of surgical site infection, 1999. Hospital Infection Control Practices Advisory Committee. Infect Control Hosp Epidemiol 1999;20(4):250-78; quiz 279-80.

Marton WJ, Jarvis WR, Culver DH, Haley RW. Incidence and nature of endemic and epidemic nosocomial infections. In: Bennett JV, Brachman PS, editor(s). Hospital infections. 3rd ed. Boston (MA): Little, Brown and Co.; 1992. p. 577-96.

Scheel O, Stormark M. National prevalence survey on hospital infections in Norway. J Hosp Infect 1999 Apr;41(4):331-5. PubMed

Wallace WC, Cinat M, Gornick WB, Lekawa ME, Wilson SE. Nosocomial infections in the surgical intensive care unit: a difference between trauma and surgical patients. Am Surg 1999 Oct;65(10):987-90. PubMed

UTILIZATION

See "Burden of Illness" field.

COSTS

See "Burden of Illness" field.

Institute of Medicine National Healthcare Quality Report Categories

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness
Timeliness

Data Collection for the Measure

CASE FINDING

Users of care only

DESCRIPTION OF CASE FINDING

Medicare discharges with a principal or secondary procedure code of selected surgeries (see the related "Denominator Inclusions/Exclusions" field)

DENOMINATOR SAMPLING FRAME

Patients associated with provider

DENOMINATOR (INDEX) EVENT

Therapeutic Intervention

DENOMINATOR INCLUSIONS/EXCLUSIONS

Inclusions
Medicare discharges with a principal or secondary procedure code of selected surgeries:

- Coronary artery bypass graft (CABG)

- Other cardiac surgery
- Colon surgery
- Hip arthroplasty
- Knee arthroplasty
- Abdominal hysterectomy
- Vaginal hysterectomy
- Vascular surgery

Refer to the Appendix in the original measure documentation for International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes.

Exclusions

- Patients who had a principal or admission diagnosis suggestive of preoperative infectious diseases (refer to the Appendix in the original measure documentation for ICD-9-CM codes)
- Patients who were receiving antibiotics at the time of admission (except colon surgery patients taking oral prophylactic antibiotics)
- Patients whose medical records do not include antibiotic start date/time or incision date/time
- Patients who were receiving antibiotics more than 24 hours prior to surgery (except colon surgery patients taking oral prophylactic antibiotics)
- Colon surgery patients who received oral prophylactic antibiotics only

NUMERATOR INCLUSIONS/EXCLUSIONS

Inclusions
Number of surgical patients who received prophylactic antibiotics within 1 hour of surgical incision (2 hours if receiving vancomycin due to beta-lactam allergy)

Exclusions
Unspecified

DENOMINATOR TIME WINDOW

Time window is a single point in time

NUMERATOR TIME WINDOW

Fixed time period

DATA SOURCE

Administrative and medical records data

LEVEL OF DETERMINATION OF QUALITY

Individual Case

PRE-EXISTING INSTRUMENT USED

Unspecified

Computation of the Measure

SCORING

Rate

INTERPRETATION OF SCORE

Better quality is associated with a higher score

ALLOWANCE FOR PATIENT FACTORS

Unspecified

STANDARD OF COMPARISON

External comparison at a point in time
External comparison of time trends

Evaluation of Measure Properties

EXTENT OF MEASURE TESTING

Unspecified

Identifying Information

ORIGINAL TITLE

Prophylactic antibiotic received within 1 hour prior to surgical incision.

MEASURE COLLECTION

7th Statement of Work Quality of Care Measure Specifications

MEASURE SET NAME

Surgical Infection Prevention (SIP)

DEVELOPER

Centers for Medicare and Medicaid Services

ENDORSER

National Quality Forum

ADAPTATION

Measure was not adapted from another source.

RELEASE DATE

2002 Aug

MEASURE STATUS

This is the current release of the measure.

SOURCE(S)

Centers for Medicare and Medicaid Services (CMS). 7th statement of work (SOW). Quality of care measure specifications: Surgical infection prevention (SIP). Baltimore (MD): Centers for Medicare and Medicaid Services (CMS); 2002 Aug 1. Various p.

MEASURE AVAILABILITY

The individual measure, "SIP-1: Prophylactic Antibiotic Received Within 1 Hour Prior to Surgical Incision," is published in "Centers for Medicare/Medicaid Services, 7th Statement of Work, Quality of Care Measure Specifications: Surgical Infection Prevention (SIP)."

For more information, e-mail CMS PROINQUIRIES at proinquiries@cms.hhs.gov.

COMPANION DOCUMENTS

A software application designed for the collection and analysis of quality improvement data, the CMS Abstraction and Reporting Tool (CART), is available from the CMS CART Web site. Supporting documentation is also available.

For more information, e-mail CMS PROINQUIRIES at proinquiries@cms.hhs.gov.

NQMC STATUS

This NQMC summary was completed by ECRI on January 6, 2003. The information was verified by the Centers for Medicare/Medicaid Services on March 14, 2003.

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