

The logo features the word "SQUIRE" in a bold, red, sans-serif font. A grey quill pen is positioned diagonally, with its tip pointing towards the center of the letter 'Q'. The quill has a dark grey tip and a lighter grey body with a feather-like texture. The letters have a slight drop shadow effect.

SQUIRE

Every Clinician · Every Patient · Every Time

SQUIRE Guide

Surgical Site Infection Prevention

as at January 2009

Surgical Site Infection Prevention

GOAL: PREVENTION OF SURGICAL SITE INFECTIONS

Sections:

- Resources
- Eligible Patient Population
- Measure 1 - Compliance With SSI Bundle
- Definition
- Elements of the SSI bundle
- Optimal prophylactic antibiotic regimen that minimises risk of post-surgical complications including SSI
- Patients who should be excluded from measurement
- Specific Considerations for the measurement of appropriate timing of antibiotics
- Appropriate hair removal
- Patients who should be excluded from measurement
- Perioperative Normothermia for Patients Undergoing Colorectal Surgery
- Patients who should be excluded from measurement
- Perioperative Euglycaemia for Patients Undergoing Cardiothoracic Surgery
- Patients who should be excluded from measurement
- Measurement Methods and Tools
- Measure 2 - Surgical Site Infection Rate
- Post-operative Surveillance
- Measurement Methods and Tools

Resources

Some of these resources may be protected by copyright, please ensure all copyright requirements are met prior to their use.

- The 'How-to' Guides developed by IHI, Safer Healthcare Now and websites of the programs listed below provide excellent information, contain invaluable tips, lessons from success, and measurement and data collection tools that can be adapted if desired:
 - Institute for Healthcare Improvement (IHI) 5 Million Lives campaign:
<http://www.ihl.org/nr/rdonlyres/c54b5133-f4bb-4360-a3e4-2952c08c9b59/0/ssihowtguide.doc>
 - Safer Healthcare Now! campaign:
<http://www.saferhealthcarenow.ca/Default.aspx?folderId=82&contentId=182>

- Safer Systems Saving Lives campaign:
<http://www.health.vic.gov.au/sssl/interventions/surgical.htm>
- QualityNet Surgical Care Improvement Project:
<http://www.qualitynet.org/dcs/ContentServer?cid=1157485287169&pagename=OnetPublic%2FPage%2FQnetTier3&c=Page>
- WA Therapeutics Advisory Group Surgical Antibiotic Prophylaxis Guidelines:
<http://www.watag.org.au/watag/docs/Theatre%20Charts%202004.pdf>
- Therapeutic Guidelines: Antibiotics
<http://etg.tg.com.au.eplibresources.health.wa.gov.au/ip/>
- Indicators for Quality Use of Medicines in Australian Hospitals: NSW Therapeutic Advisory Group
<http://www.ciap.health.nsw.gov.au/nswtag/publications/QUMIndicators/Manual0408.pdf>

Eligible Patient Population

- The SSI prevention CPI program has been intended to be applied to all eligible clean or clean-contaminated surgery patients for which antibiotic prophylaxis guidelines apply.
- The primary groups of surgical patients where this approach has been effective are abdominal hysterectomy, vaginal hysterectomy, hip arthroplasty, knee arthroplasty, cardiac surgery, vascular surgery, caesarean section and colorectal surgery and these patient groups represent a reasonable operational definition of the “every patient, every time” expectation for this CPI program at this stage. Sites that do not perform these surgery types, but can apply the bundle to an appropriate patient population can adapt resources to suit their local context.
- For reporting spread within a site to OSQH, the proportion of clean and clean contaminated surgical patients that are within the target group of the improvement program at each site should be estimated. This should include elective and emergency cases if possible.

MEASURE 1 - COMPLIANCE WITH SSI BUNDLE

Definition

- The proportion of eligible surgical patients documented to receive ALL elements of the SSI bundle. For the majority of patients, the bundle will comprise 4 elements - 3 relating to antibiotics (element A), 1 to hair removal (element B). For colorectal and cardiothoracic patients, there are 5 required elements of the bundle with the addition of elements C or D respectively (below).
- Data collection is likely to be best done integrated into daily work (i.e. 'real-time' or concurrent).
- For this measure, sites should select a random sample from each of the patient populations they have spread their program to. Data from different patient groups should however be combined to a total figure to report overall performance to the OSQH.

A suggested sample size calculation is:

Average number of patients undergoing specified surgical procedure / month (calculate separately for each procedure)	Minimum sample size required / month for each specified procedure
160 or more	16 patients per procedure
60 - 159	10% of patients per procedure
6 - 59	6 patients per procedure
Less than 6	All patients undergoing specified procedure

Elements of the SSI bundle

A. Optimal prophylactic antibiotic regimen that minimises risk of post-surgical complications including SSI

This refers to patients documented as receiving ALL of the following:

1. Correct antibiotic choice: includes correct medication choice, route of administration and dosing schedule.
2. Correct timing: generally means up to 60 minutes prior to skin incision and as a single dose. A second dose may be necessary if there is a delay in starting the operation; if cephalothin, cephazolin, dicloxacillin or flucloxacillin are used and the operation is prolonged (longer than 3 hrs); or in other circumstances specified in guidelines.

3. Correct duration: antibiotic prophylaxis is ceased within 24 hours of completion of surgery (or within 48 hours for vascular surgery).
 - The WA Therapeutics Advisory Group (WATAG) endorses the Therapeutic Guidelines: Antibiotic (“pink book”) as the guide to appropriate antibiotic use within WA public healthcare facilities. This guideline includes information regarding timing, selection and discontinuation of antibiotic prophylaxis for a variety of types of surgery. The current edition of this guideline is Version 13, published in 2006 and available electronically via CIAO (<http://etg.tg.com.au.eplibresources.health.wa.gov.au/ip/>). This should be used as the standard against which to measure compliance. Current WATAG guidelines for preferred agents for antibiotic prophylaxis are based on this guideline and can be obtained from WATAG

http://www.watag.org.au/watag/docs/Surgery_Charts_2008.pdf

- Where there are minor differences in content between the WATAG guidelines and the TGA Antibiotic Guidelines, the more recent guideline should be used as a reference.

Patients who should be excluded from measurement

- For inclusions, exclusions and definitions for individual components of this measure refer to: QualityNet. Specifications Manual
<http://www.qualitynet.org/dcs/ContentServer?cid=1157485287169&pagename=OnePublic%2FPage%2FQonetTier3&c=Page> (section 2.4 SCIP-Inf-1-3)

Specific Considerations for the measurement of appropriate timing of antibiotics

- Measure surgical patients with prophylactic antibiotic administration within 60 minutes prior to surgical incision.
- Teams can aim to reduce the time from (e.g. to 30 minutes) if they wish to based on local expertise and opinion.
- Use start time of the infusion to determine administration time, and if not recorded, score as noncompliant.

Some specific situations require adaptation of the definition of ‘appropriate timing.’ In these situations, compliance with the measure can be assessed using an adapted definition to reflect accepted best practice standards. These situations include:

- Infusions of vancomycin and fluoroquinolones need to start within TWO hours of surgery rather than 60 minutes.

- For caesarean section procedures, antibiotics should be administered immediately after the cord is clamped.
- For procedures involving use of an inflatable cuff or tourniquet to the operative site, the antibiotic should be fully infused prior to inflation of the cuff.

B. Appropriate hair removal

This refers to surgical patients with appropriate hair removal, i.e:

- It is **inappropriate** to remove surgical site hair by shaving
- It is appropriate to remove surgical site hair with clippers or depilatory
- It is appropriate not to remove surgical site hair (this may vary according to surgeon preference and surgery type).

Patients who should be excluded from measurement

- Patients who are less than 18 years of age
- Patients who performed their own hair removal
- Patients whose methods of hair removal could not be determined

C. Perioperative Normothermia for Patients Undergoing Colorectal Surgery

This refers to colorectal surgical patients with normothermia (36.0 - 38.0 C) in post-anaesthesia care unit

- The best evidence for the efficacy of this intervention is in patients having colorectal surgery. Teams should start with this group of patients, but can also include other types of surgery if they wish (excluding surgical cases where therapeutic hypothermia is used).
- This measurement should be the first temperature recorded on arrival in the postoperative recovery area.

Patients who should be excluded from measurement

- Patients who are less than 18 years of age
- Burn or transplant patients
- Patients with physician documented infection prior to surgical procedure of interest
- Patients who expired intraoperatively

D. Perioperative Euglycaemia for Patients Undergoing Cardiothoracic Surgery

The goal is for cardiac surgical patients' blood glucose to be less than 11.1 mmol/L at approximately 6am on both postoperative days 1 and 2.

Patients who should be excluded from measurement

- Patients who had a principal diagnosis suggestive of preoperative infectious diseases
- Patients less than 18 years of age
- Patients with physician documented infection prior to surgical procedure of interest
- Burn and transplant patients

Measurement Methods and Tools

- Glucose can be measured using finger sticks, glucometers or in a laboratory. The patient doesn't have to be fasting.
- Preoperative measurement of glucose will support the implementation of this measure.
- Tighter glycaemic control than specified as a minimum may be ideal, but is likely to only be possible in an intensive care unit setting.

Measure 1 calculation:

$\frac{\text{Number of surgical patients who were documented to receive all appropriate elements of the SSI bundle during the monitoring period}}{\text{Number of surgical patients audited during the monitoring period}}$	X 100	=	% of surgical patients who receive all appropriate elements of the surgical site infection bundle
---	-------	---	---

MEASURE 2 - SURGICAL SITE INFECTION RATE

- This outcome measure is likely to change slowly, and only after the processes reflected in Measure 1 improve. The group(s) chosen for inclusion in this measure should also be sampled for inclusion in Measure 1.

Post-operative Surveillance

- As the primary goal of this target is reduction of each institution's own infection rate, surveillance has to be managed with the appropriate resource allocation determined by each hospital. Hence each hospital may nominate a particular type(s) of surgery to focus on improving care processes and prospectively monitoring outcome, and then make plans to spread the program to other types of surgery.

- Prospective surveillance of patients following a specific type of clean/clean contaminated surgery is likely to be the most effective strategy, building on existing programs where possible.
- Suitable types of surgery to include in such a surveillance program will vary in different hospitals, but ideally should target specific types of clean/clean contaminated surgery (NNIS I or II - attachment 2), for which antibiotic prophylaxis is routinely indicated, and which are undertaken in relatively large volume. Consideration may also be paid to the length of inpatient stay for follow-up to detect infections. Examples include, but are not limited to, hip or knee arthroplasty, cardiac bypass grafting surgery, laminectomy, colectomy, caesarean section. Infection control expertise will be *vital* in these considerations.

Measurement Methods and Tools

- A trained infection control professional should ideally collect or oversee continuous prospective collection of data for this measure, as interpretation is required.
- Nationally endorsed surveillance definitions should be used for this measure, as stipulated in the Australian Council on Healthcare Standards (ACHS) Infection Control indicators which have been developed and endorsed by the Australian Infection Control Association (AICA) National Advisory Board, and are used by HISWA in WA.
- The duration or type of post-discharge surveillance is not mandated but should be consistent over time at each site to allow measurement of improvement.
- While stratification at a local level (e.g. by risk index, by operator, by type of SSI and type of surgery) is important, data should be combined for reporting to OSQH.
- Technical support for infection control staff in relation to this measure will be available from staff at Healthcare Infection Surveillance WA (HISWA).
- Infections detected within 30 days of operation, (or a year in the presence of surgical implant) can be included as stipulated in the ACHS definition.
- Risk index stratification (e.g. NNIS risk index 0-3) or separation into superficial/deep/organ space infections is not required to be reported to OSQH.
- Hospitals performing small numbers of all appropriate surgery types (e.g. <50 each year) can choose to omit this measure, or seek further advice from HISWA hiswa@health.wa.gov.au

Measure 2 calculation:

Number of patients with a superficial OR deep OR organ space surgical site infection following specified surgical procedure	=	Rate of surgical site infection
Number of specified surgical procedures performed		