Louth: Antimicrobial Guidelines - Louth Hospitals: Antimicrobial Guidelines: Principles of Surgical Prophylaxis

Goal of surgical prophylaxis

The goal of surgical antibiotic prophylaxis is to prevent surgical site infection. The choice of agent(s) is determined by the likely potential pathogens at the operative site.

Choice of surgical prophylaxis

- The choice of agent will be governed by the procedure and the likely potential pathogen.
- The choice of agent may also be influenced by recent or previous infection, prolonged hospital stay, or colonisation with MRSA or other resistant organisms. In such circumstances, it is advisable to consult the latest culture and sensitivity reports and consult with Microbiology.
- An agent that may be appropriate for surgical prophylaxis may not be the optimal agent for the therapy of established infection.
- All active infections should be under treatment prior to surgery.
- Patients should have their tetanus status checked if a contaminated wound is present, as well as receiving prophylactic antimicrobials. Please refer to the Immunisation Guidelines for Ireland for latest guidance on risk assessment.

Timing of surgical prophylaxis

Surgical antibiotic prophylaxis should be **fully administered within 60 minutes before the first incision** to ensure maximum blood and tissue levels at the time of first incision. In surgery where a tourniquet is to be applied, a 15 minute period is required between the end of prophylactic antibiotic administration and tourniquet application.

Number of doses of surgical prophylaxis

A **single pre-operative dose** is recommended for surgical prophylaxis except for orthopaedic procedures where up to 24 hours prophylaxis may be indicated.

A second dose intra-operatively is indicated if:

(1) the duration of the operation is longer than 4 hours

(2) if there is significant blood loss of more than 1,500mL for adults or 25mL/kg for paediatrics. In this case , the second dose of antibiotic should be given after fluid replacement.

- A second dose of gentamicin and teicoplanin/vancomycin is **NOT** indicated due to prolonged action
- The redosing interval should be measured from the time of administration of the pre-operative dose, not from the beginning of the procedure.

Dose of each agent

ANTIBIOTIC	ADULT DOSE	PAEDIATRIC DOSE
Cef-UR-oxime	1.5g IV bolus	50mg/kg IV bolus (max 1.5g)
Metronidazole	500mg IV infusion over 20 mins	15mg/kg IV infusion over 20 mins (max 500mg)
Gentamicin	5mg/kg IV bolus (max 480mg) Renal Dose: 3mg/kg IV bolus Obesity: If BMI $\geq$ 30kg/m^2 , use gentamicin calculator to calculate obesity-adjusted dose	7mg/kg IV bolus (max 480mg) Renal Dose: 2 – 5 mg/kg IV bolus Obesity: If BMI $\geq$ 30kg/m^2 , use ideal body weight to calculate dose
Teicoplanin	12mg/kg IV bolus (rounded to the nearest 200mg)	Child 1 – 2 months: 16mg/kg IV bolus Child > 2 months: 10mg/kg IV bolus
Clindamycin	900mg IV infusion over 30 mins	-

MRSA■ considerations

MRSA Considerations :

- All orthopaedic patients should be screened for MRSA as per LH Infection Prevention and Control Guidelines.

- MRSA Eradication Protocol: Intranasal mupirocin three times daily for 5 days PLUS chlorhexidine body washes.
- The MRSA eradication protocol should be used prophylactically for adult patients undergoing surgery with a high risk of major morbidity who are identified with *S. aureus* or MRSA.
- For MRSA positive patients, teicoplanin should be administered for surgical prophylaxis.
- Teicoplanin should also be considered in cases where MRSA is specifically suspected, for example, patients with a known history of MRSA colonisation without documented eradication and patients at high risk for MRSA colonisation in the absence of surveillance data, eg. patients who were recently hospitalised, transferred from another healthcare institution or nursing home residents.

Caution - risk of anaphylaxis with teicoplanin

Anaphylactic reaction / anaphylaxis occurs uncommonly (> 1/1,000 to <1/100) as per Summary of Product Characteristics

NAP6 Report 2018:

Overall incidence of peri-operative anaphylaxis due to antibiotics was estimated at 4 per 100,000 exposures.

The highest estimated incidence was for teicoplanin (16.4 per 100,000 exposures) followed by co-amoxiclav (8.7 per 100,000 exposures).Over half of patients who reacted to teicoplanin reported pre-operatively that they were allergic to penicillin.

Hypotension was the most common presenting feature.

Onset of symptoms was less than 10 minutes in 92% of cases and less than 30 minutes in all cases, therefore administration several minutes before induction of anaesthesia would likely improve detection and may simplify treatment.

Definition of Surgical Site Infection

CDC/NHSN Surveillance Definition of Surgical Site Infection:

See https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf for full information.

Superficial Incisional :

Date of event occurs within 30 days following the NHSN operative procedure (where day 1 = the procedure date) AND involves only skin and subcutaneous tissue of the incision AND patient has at least one of the following:

a. purulent drainage from the superficial incision.

b. organism(s) identified from an aseptically-obtained specimen from the superficial incision or subcutaneous tissue by a culture or nonculture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment.

c. a superficial incision that is deliberately opened by a surgeon, physician or physician designee and culture or non-culture based testing of the superficial incision or subcutaneous tissue is not performed

AND

patient has at least one of the following signs or symptoms: localized pain or tenderness; localized swelling; erythema; or heat.

d. diagnosis of a superficial incisional SSI by a physician or physician designee.

There are two specific types of superficial incisional SSIs:

1. Superficial Incisional Primary (SIP) – a superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions (for example, C-section incision or chest incision for CBGB).

2. Superficial Incisional Secondary (SIS) – a superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (for example, donor site incision for CBGB).

Deep Incisional :

Date of event occurs within 30 or 90 days following the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2 AND involves deep soft tissues of the incision (for example, fascial and muscle layers) AND patient has at least one of the following:

a. purulent drainage from the deep incision.

b. a deep incision that is deliberately opened or aspirated by a surgeon, physician or physician designee or spontaneously dehisces

AND

organism(s) identified from the deep soft tissues of the incision by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment or culture or nonculture based microbiologic testing method is not performed. A culture or non-culture based test from the deep soft tissues of the incision that has a negative finding does not meet this criterion

AND

patient has at least one of the following signs or symptoms: fever (>38°C); localized pain or tenderness.

c. an abscess or other evidence of infection involving the deep incision detected on gross anatomical exam, histopathologic exam, or imaging test.

There are two specific types of deep incisional SSIs:

1. Deep Incisional Primary (DIP) – a deep incisional SSI that is identified in a primary incision in a patient that has had an operation with one or more incisions (for example, C-section incision or chest incision for CBGB).

2. Deep Incisional Secondary (DIS) – a deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (for example, donor site incision for CBGB).

Organ/Space :

Date of event occurs within 30 or 90 days following the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2 AND involves any part of the body deeper than the fascial/muscle layers that is opened or manipulated during the operative procedure AND patient has at least one of the following:

a. purulent drainage from a drain placed into the organ/space (for example, closed suction drainage system, open drain, T-tube drain, CTguided drainage).

b. organism(s) identified from fluid or tissue in the organ/space by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment.

c. an abscess or other evidence of infection involving the organ/space detected on gross anatomical exam or histopathologic exam, or imaging test evidence definitive or equivocal for infection.

AND

meets at least one criterion for a specific organ/space infection site listed in Table 3.