Improving antibiotic prescribing for surgical prophylaxis

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Antibiotic Awareness Week
November 2017
Scope of the problem

• Surgical prophylaxis has been the **top indication** for prescribing antimicrobials in hospitals for 3 consecutive years (2013-2015)

• **40.5% inappropriateness** (2015)
  – Incorrect duration 29.9%
  – Incorrect dose 27.6%
  – Does not require antibiotics 22%

• 27.4% of prescriptions prescribed longer than 24 hours (2015)

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Priority Area 2.3

Develop resources that support appropriate antibiotic use for surgical prophylaxis and consistency with national guidelines.
Actions

• Australian Commission on Safety and Quality in Health Care (ACSQHC) will investigate opportunities to improve prescribing in collaboration with
  – Royal Australasian College of Surgeons (RACS)
  – State and Territory health authorities

• Accreditation advisory requiring inclusion of surgical prophylaxis as a part of an AMS program
AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

Advisory no: A17/01
Antimicrobial Stewardship

PURPOSE:
To advise accrediting agencies of health service organisations’ requirements for the Preventing and Controlling Healthcare Associated Infections Standard in the National Safety and Quality Health Service (NSQHS) (first edition) relating to antimicrobial stewardship.

ISSUE:
The Preventing and Controlling Healthcare Associated Infections Standard criterion on Antimicrobial Stewardship requires that all health service organisations have an antimicrobial stewardship (AMS) program in place. The Preventing and Controlling Healthcare Associated Infections Standard Safety and Quality Improvement Guide sets out the key tasks required for organisations to implement an AMS program, and specifies actions that incorporate surgical prophylaxis.

In addition, the Australian Commission on Safety and Quality in Health Care has developed a Clinical Care Standard that describes the care a patient should receive for optimal treatment with antibiotics.

Quality statement 9 of the Antimicrobial Stewardship Clinical Care Standard requires that if a patient having surgery requires prophylactic antibiotics, the prescription is made in accordance with the current Therapeutic Guidelines: antibiotic (or local antibiotic formulary) and that takes into consideration the patient’s clinical condition. For health service organisations, this means supporting clinicians to provide appropriate prophylactic antimicrobial therapy for patients undergoing surgery to reduce the risk of surgical site infection.

Successive National Antimicrobial Prescribing Surveys from 2013 to 2016 show sustained levels of inappropriate prescribing of antimicrobials for surgical prophylaxis in relation to duration, choice of agent and indication. There was a reduction in the proportion of surgical prophylaxis prescriptions prescribed for longer than 24 hours (27.4%) in 2015 compared with 36.0% in 2014; however, the rate of inappropriate surgical prophylaxis prescriptions remained steady over three years (41.0% in 2013, 46.0% in 2014 and 46.5% in 2015).

5 Australian Institute of Health and Welfare. METeOR indicator specifications.
   https://www.nps.org.au/

REQUIREMENTS:
Health service organisations should ensure surgical prophylaxis is included and addressed as part of their antimicrobial stewardship program.

To demonstrate that the requirement is met, organisations can monitor their performance using the indicators for quality statements 6 and 9 of the Antimicrobial Stewardship Clinical Care Standard:

- Indicator 6a: Rate of documentation of clinical reason (or indication) for prescribing antibiotics
- Indicator 6b: Surgical antibiotic prophylaxis in accordance with guidelines
- Indicator 6c: Timely administration of prophylactic antibiotics prior to surgery
- Indicator 6d: Cessation of prophylactic antibiotics after surgery

Monitoring of antimicrobial usage and appropriateness of prescribing should inform the ongoing risk assessment for the AMS program. Participation in the National Centre for Antimicrobial Stewardship’s National Antimicrobial Prescribing Survey and the National Antimicrobial Utilisation Surveillance Program (NAUSP) are options for monitoring.

The organisation should be able to demonstrate evidence of action taken in response to issues identified as a result of monitoring.

Accrediting agencies are to ensure that within three months of the release of this Advisory, to rate actions in the antimicrobial stewardship criterion of the Preventing and Controlling Healthcare Associated Infections Standard as satisfactorily met, the health service organisation has to include and address surgical antimicrobial prophylaxis as part of its antimicrobial stewardship program.

Evidence of this would include evidence of monitoring antimicrobial use in relation to surgical prophylaxis and taking action in response to issues identified.

Compliance with this Advisory must be assessed in the context of all actions in the Preventing and Controlling Healthcare Associated Infections Standard Criterion:

- Governance and systems for infection prevention, control and surveillance; and
- Antimicrobial stewardship.
Advisory no: A17/01 | Antimicrobial Stewardship

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Health service organisations should ensure surgical prophylaxis is included and addressed as part of their antimicrobial stewardship program.

To demonstrate that the requirement is met, organisations can monitor their performance using the indicators for quality statements 6 and 9 of the Antimicrobial Stewardship Clinical Care Standard:

- Indicator 6a: Rate of documentation of clinical reason (or indication) for prescribing antibiotics
- Indicator 9a: Surgical antibiotic prophylaxis in accordance with guidelines
- Indicator 9b: Timely administration of prophylactic antibiotics prior to surgery
- Indicator 9c: Cessation of prophylactic antibiotics after surgery.

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- Governance and systems for infection prevention, control and surveillance; and
- Antimicrobial stewardship.

Tools for data collection

- NSW TAG QUM indicators
- Hospital NAPS
- SNAPS

Required data sources

- Medical notes, medication charts and intra-operative medication administration records (anaesthetic chart)
  - SNAPS also requires microbiology and radiology reports
National QUM Indicators for Australian Hospitals

Set 2: Antibiotic therapy

Indicators and their accompanying data collection tools are listed below. We strongly recommend downloading the following documents to guide use of the indicators:

- Using the National Quality Use of Medicines Indicators for Australian Hospitals which contains critical information on using the indicators for quality improvement
  - PDF ~ 1.2 MB | MS_Word ~ 997 KB
- Data collection tool user guide
  - PDF ~ 829 KB | MS_Word ~ 1.6 MB

Individual Indicators

2.1 Percentage of patients undergoing specified surgical procedures that receive an appropriate prophylactic antibiotic regimen
  - PDF ~ 154 KB | MS_Word ~ 875 KB with tool MS_Excel ~ 293 KB

2.2 Percentage of prescriptions for restricted antibiotics that are concordant with drug and therapeutics committee approved criteria
  - PDF ~ 152 KB | MS_Word ~ 864 KB with tool MS_Excel ~ 306 KB

2.3 Percentage of patients in whom doses of empirical aminoglycoside therapy are continued beyond 48 hours
  - PDF ~ 155 KB | MS_Word ~ 867 KB with tool MS_Excel ~ 295 KB

2.4 Percentage of adult patients with community acquired pneumonia that are assessed using an appropriate validated objective measure of pneumonia severity
  - PDF ~ 145 KB | MS_Word ~ 861 KB with tool MS_Excel ~ 289 KB

2.5 Percentage of patients presenting with community acquired pneumonia that are prescribed guideline concordant antibiotic therapy
  - PDF ~ 145 KB | MS_Word ~ 860 KB with tool MS_Excel ~ 305 KB
### Process Measures

- **Percentage of patients who received an appropriate antimicrobial timely prior to incision**
- **Percentage of patients who received an antibiotic for the correct duration**
• Hospital NAPS audit tool - https://www.naps.org.au
• Surgical NAPS (SNAPS) specifically designed for surgical (and non-surgical) procedures

• Longitudinal survey
  – Recommended to be done over a minimum of one week or 30 consecutive procedures

• Retrospective or prospective

• Benchmarking period for 2017: 1 February 2017-30 November 2017
• Surgical NAPS audit tool - https://www.naps.org.au
Other options

• Form your own data collection tool
  – Focus on a specific problem in your facility
A case for change

• Strong evidence to support the use of appropriate surgical antibiotic prophylaxis to prevent postoperative infection

• Inappropriate use increases both cost and the selective pressure favouring the emergence of resistant bacteria

• Continuing antibiotic prophylaxis does not improve efficacy and increases toxicity and cost

To improve patient care by increasing appropriate surgical antibiotic prophylaxis to above 95% within 18 months

**Primary Drivers**

- Improve knowledge & confidence in antibiotic prophylaxis prescribing
- Standardise the process of prescribing antibiotic prophylaxis
- Improve communication before and after surgery between staff
- Improve accuracy of attitudes & beliefs about appropriate antibiotic prophylaxis

**Secondary Drivers**

- Increase access to ID/Micro/other experts in antibiotic use
- Improve the identification of those who require antibiotic prophylaxis
- Improve documentation of antibiotic choice, dose & duration
- Increase agreement with guidelines to promote relevance to practice
- Change entrenched habits of previous suboptimal practice
- Deconstruct myths that antibiotics are harmless medicines
- Increase awareness of existing guidelines
- Improve the rate of appropriate antibiotic choice for the specific procedure
- Increase transparency of reasons for non-concordant orders
- Improve review process of antibiotic order
- Increase education on appropriate antibiotic use
- Increase the rate of appropriate antibiotic administration time, dosing & duration
- Improve adherence to evidence-based antibiotic prophylaxis guidelines
- Increase awareness of existing guidelines
- Improve review process of antibiotic order
- Increase transparency of reasons for non-concordant orders
- Improve documentation of antibiotic choice, dose & duration
- Increase agreement with guidelines to promote relevance to practice
- Change entrenched habits of previous suboptimal practice
- Deconstruct myths that antibiotics are harmless medicines

**Change ideas**

- In-services by AMS team on appropriate antibiotic use to surgeons and anaesthetists
- Poster campaign to promote principles of good prescribing
- Academic detailing with surgeons anaesthesists and by AMS team
- AMS-surgical rounds
- Develop evidence based guidelines in consultation with surgeons/anaesthetists
- Display guidelines in theatres - poster
- Establish antibiotic order set for specific surgical procedures in eMM
- Stock operating theatre with antibiotics only recommended by guidelines
- Monitor adherence with guidelines and provide feedback – compare specialty’s performance to others and report to relevant committees
- Incorporate prompts for antibiotic stop within the operating report
- Post operative checklist with documented plan that includes antibiotic review
- Feedback of 30 day morbidity and mortality results to treating teams
- Clinical champions supportive of AMS
- Gain support of hospital Exec
- Regular forum to support peer to peer accountability
Thank you

Questions?

Comments?

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Surgical Antibiotic Prophylaxis

Prepared by Fiona Doukas BPharm MPH BCGP
Senior Pharmacist (Antimicrobial Stewardship)
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November 2017
Aims

• Describe strategies that were implemented to support compliance with surgical antibiotic prophylaxis guidelines
Background and evidence

• One-third to one-half of all hospital antibiotic use

• Inappropriate antibiotic use ranges from 30% to 90%, especially with respect to timing and duration of antibiotic therapy

• A national report recently released indicates that NSW hospital have one of the lowest rates of compliance with surgical antibiotic prophylaxis guidelines
Strategies

Governance & leadership

Engage key stakeholder (enablers & barriers)

- Peri-operative: Anaesthetics, Surgeons, Theatre nurses
- Post-operative: Ward nurses, CNCs, pharmacists, JMOs

Monitor performance

- Hospital/ward/unit level

Education & training

- Support & tools including guidelines
Monitor performance

• Local Audit
  – Retrospective
  – Prospective
• NSW TAG QUM indicator 2.1
  
  *Percentage of patients undergoing specified surgical procedures that receive an appropriate prophylactic antibiotic regimen*

• Surgical National Antimicrobial Prescribing Survey (sNAPS)
Monitor performance

Doukas FF, Fox JA, Gottlieb T, McLaws ML, McLachlan AM. Surgical Antibiotic Prophylaxis in a University teaching hospital: A retrospective study investigating prescribing according to national guidelines. Poster presented at Medicines Management 2015; SHPA
Governance & leadership

- AMS Committee
- Division of Surgery
  - Heads of Surgical departments
  - Surgical superintendent
- Anaesthetists
- Clinical Nurse Consultants
- Executives
- Consumers
Engage key stakeholders

- Provide feedback from the national report / local audit
- Determine enablers and barriers to compliance with surgical antibiotic prophylaxis guidelines
- Consensus on best evidence-based practice
- Engagement with guideline development & dissemination
  - Letter co-signed by Division of Surgery & AMS
- Agenda on M&M meetings
Engage key stakeholders

Peri-operative
- Anaesthetists
- Surgeons
- Theatre Nurses

Post Operative
- JMOs
- Pharmacists
- Nurses: CNCs & RNs
Engage key stakeholders

GENERAL PROPHYLAXIS PRINCIPLES

Timing
- All antibiotics are given as a SINGLE dose prior to surgical incision unless otherwise specified.
- Prophylaxis given post-incision increases risks for post-operative infection.
- Cefazolin, clindamycin, metronidazole should be administered within 60 minutes (ideally 15-30 min pre-incision).
- Vancomycin should be started 30 to 120 minutes before surgical incision (infusion rate of 10 mg/min) and the infusion can continue during surgery.

Agent
- Cefazolin is the agent of choice for the majority of prophylaxis regimens.
- Teicoplanin is an alternative to vancomycin, but can be given as a bolus (800mg) 15 to 30 minutes before incision. Use in MRSA prophylaxis and in β-lactam hypersensitivity.
- Gentamicin is recommended for a limited number of indications where contraindications to cefazolin exist or where a broader spectrum of Gram-negative activity is required; used as a single dose risk of toxicity is low, but hearing and renal function should always be pre-assessed.
- Broad-spectrum antibiotics (e.g. ceftriaxone) are not indicated for prophylaxis, unless a pre-existing infection is documented.

Dosing
- A repeat intraoperative dose is given if procedure is prolonged.
- Cefazolin is re-dosed every 4 hours peri-operatively.
- Cefazolin is routinely dosed as 2g dose. In obese patients (>120kg), 3g cefazolin can be used.
- Gentamicin dosing is 2mg/kg as a single dose except in urological surgery use 5mg/kg when used for extended 24 hour cover.

Duration
- Up to 24 hours (2 post-operative doses of cefazolin) is recommended only for complex cardiovascular and vascular surgery.
- Prophylaxis should not extend beyond 24 hours regardless of the surgical procedure.
- Oral antibiotics should not be prescribed to patients following routine elective surgery, these do not provide benefit.
- Antibiotics >24 hours and post-operative oral antibiotic courses increase the risk of subsequent infections with resistant pathogens and Clostridium difficile.

Catheters
- The duration of prophylaxis should not be extended because urinary or intravascular catheters or indwelling drains remain in situ. This practice is not supported by evidence.
- Antibiotic prophylaxis at the time of urinary catheter removal is not recommended, other than in selected patients after urological surgery.

Urine screening
- Routine screening for asymptomatic bacteriuria is not recommended. Only perform pre-operative urine cultures in symptomatic patients and prior to surgery involving urinary tract manipulation.

MRSA cover (known MRSA colonised patients or where increased risk of postoperative MRSA infection)
- Use both cefazolin and teicoplanin OR vancomycin.
- Teicoplanin & vancomycin are less effective at preventing MSSA infections if used as sole agents.
- In MRSA colonised patients, decontamination prior to the procedure should be considered. Use mupirocin 2% nasal ointment twice daily plus 2% chlorhexidine wash daily, for 5 days, in the week before the procedure.
- Consider preoperative Staphylococcus aureus and MRSA screening, and decolonisation, for complicated surgery especially when procedures involve prosthetic / graft implantation.

Resistant organisms
- Consider screening for multidrug-resistant (MDR) Gram-negative organisms before complex gastrointestinal surgery or transrectal prostate biopsy if increased risk of faecal MDR GNB carriage.
Engage key stakeholders

<table>
<thead>
<tr>
<th>SURGERY TYPE</th>
<th>RECOMMENDED ANTIBIOTIC</th>
<th>ALTERNATIVE IN BETA-LACTAM ALLERGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biliary surgery, including laparoscopic</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>• Low risk</td>
<td>• nil</td>
<td>• nil</td>
</tr>
<tr>
<td>• High risk (e.g. &gt;70y, diabetes, obstructive jaundice, common bile duct stones, acute cholecystitis, nonfunctioning gall bladder, open cholecystectomy)</td>
<td>• cefazolin 2g</td>
<td>• clindamycin 2mg/kg +</td>
</tr>
<tr>
<td>• nil</td>
<td>• nil</td>
<td>• clindamycin 600mg OR</td>
</tr>
<tr>
<td></td>
<td>• cefazolin 2g</td>
<td>• teicoplanin 800mg OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• vancomycin 15mg/kg</td>
</tr>
<tr>
<td>Gastroduodenal and oesophageal surgery</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>• Low risk</td>
<td>• nil</td>
<td>• nil</td>
</tr>
<tr>
<td>• High risk (e.g. obesity, immune-compromise; entry into GIT lumen, gastric outlet obstruction; reduced gastric acidity or motility; GIT bleeding, malignancy)</td>
<td>• cefazolin 2g</td>
<td>• clindamycin 2mg/kg +</td>
</tr>
<tr>
<td>• nil</td>
<td>• nil</td>
<td>• clindamycin 600mg OR</td>
</tr>
<tr>
<td>• cefazolin 2g</td>
<td></td>
<td>• teicoplanin 800mg OR</td>
</tr>
<tr>
<td>• nil</td>
<td></td>
<td>• vancomycin 15mg/kg</td>
</tr>
<tr>
<td>Small intestinal surgery without obstruction</td>
<td>cefazolin 2g</td>
<td>(a) gentamicin 2mg/kg +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>clindamycin 600mg OR</td>
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<tr>
<td></td>
<td></td>
<td>(b) gentamicin 2mg/kg +</td>
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<tr>
<td></td>
<td></td>
<td>teicoplanin 800mg OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vancomycin 15mg/kg</td>
</tr>
<tr>
<td>Small intestinal surgery with obstruction</td>
<td>cefazolin 2g + metronidazole 500mg</td>
<td>(a) alone OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(b) + metronidazole 500mg</td>
</tr>
<tr>
<td>Colorectal surgery and appendicectomy</td>
<td>cefazolin 2g + metronidazole 500mg</td>
<td>gentamicin 2mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ metronidazole 500mg</td>
</tr>
<tr>
<td>Hernia repair</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>• Without prosthetic material (e.g. mesh)</td>
<td>• nil</td>
<td>• nil</td>
</tr>
<tr>
<td>• Mesh or other risk factors (e.g. &gt;70y, reoperation, immunocompromised, prolonged surgery)</td>
<td>• cefazolin 2g</td>
<td>• teicoplanin 800mg OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• vancomycin 15mg/kg</td>
</tr>
<tr>
<td>Urology surgery</td>
<td>RECOMMENDED ANTIBIOTIC</td>
<td>ALTERNATIVE IN BETA-LACTAM ALLERGY</td>
</tr>
<tr>
<td>-----------------</td>
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</tr>
<tr>
<td><strong>Endoscopic procedures</strong>&lt;br&gt;Low risk: uncomplicated diagnostic cystoscopy, (sterile urine, no manipulation)</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>Higher risk: (eg. lithotripsy with internal stent, nephrostomy tube or IDC in situ, resection of necrotic tumours, outlet obstruction, risk of bleeding, incomplete bladder emptying)&lt;br&gt;Intrarenal and ureteric stone procedures</td>
<td>cephalozin 2g + MRSA cover (if urinary tract MRSA)</td>
<td>gentamicin 2mg/kg + vancomycin 15mg/kg (if urinary tract MRSA)</td>
</tr>
<tr>
<td><strong>TURP</strong></td>
<td>gentamicin 2mg/kg + vancomycin 15mg/kg (if urinary tract MRSA) OR if sterile urine or if gentamicin use is to be avoided, use: cephalozin 2g OR trimethoprim 300mg oral OR co-trimoxazole 160/800mg oral + vancomycin 15mg/kg (if urinary tract MRSA)</td>
<td>cephalozin 2g OR trimethoprim 300mg oral OR co-trimoxazole 160/800mg oral + vancomycin 15mg/kg (if urinary tract MRSA)</td>
</tr>
<tr>
<td><strong>TRUS</strong>&lt;br&gt;High risk for MDR (e.g. recent travel history, previous ESBL, LTCF residence – consider pre-op screening)</td>
<td>ciprofloxacin 1g oral, 1-2h pre-op (if delays &gt;6 hours, repeat 500mg dose)</td>
<td>contact ID/Microbiology team pager: 60941</td>
</tr>
<tr>
<td><strong>Transperineal prostatic biopsy</strong></td>
<td>nil OR cephalozin 2g</td>
<td>*current evidence for prophylaxis is uncertain</td>
</tr>
<tr>
<td><strong>Open or laparoscopic urological procedures</strong>&lt;br&gt;Sterile urine &amp; no entry into urinary tract (e.g. vasectomy, scrotal surgery) and no obstruction / urinary tract abnormalities and no prostheses implanted</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>Prophylaxis indicated &amp; no entry into urinary tract</td>
<td>cephalozin 2g</td>
<td>vancomycin 15mg/kg</td>
</tr>
<tr>
<td>Implantation of prostheses (e.g. penile prostheses, sphincters, mesh), Radical prostatectomy</td>
<td>cephalozin 2g + gentamicin 2mg/kg OR if gentamicin use is to be avoided and urine is sterile, use: trimethoprim 300mg oral OR co-trimoxazole 160/800mg oral + vancomycin 15mg/kg (if MRSA colonised)</td>
<td>vancomycin 15mg/kg + gentamicin 2mg/kg OR if gentamicin use is to be avoided and urine is sterile, use: trimethoprim 300mg oral OR co-trimoxazole 160/800mg oral</td>
</tr>
<tr>
<td><strong>Open or laparoscopic urological procedures</strong>&lt;br&gt;Entry into urinary tract, obstruction/abnormalities</td>
<td>cephalozin 2g + vancomycin 15mg/kg (if MRSA colonised)</td>
<td>vancomycin 15mg/kg + gentamicin 2mg/kg OR if gentamicin use is to be avoided, and urine is sterile, use: trimethoprim 300mg oral OR co-trimoxazole 160/800mg oral</td>
</tr>
<tr>
<td>Entry into bowel lumen (e.g. ileal conduit, rectocele)</td>
<td>metronidazole 500mg (+)</td>
<td>metronidazole 500mg (+)</td>
</tr>
</tbody>
</table>
**Engage key stakeholders**

- **Vancomycin** should commence before the procedure, and administered at a rate no faster than 10mg/minute.
- **Gentamicin** dosed as 2mg/kg as a single dose, using ideal body weight.
- Gentamicin should only be used for a limited number of indications; Used as a single dose risk of toxicity is low, but hearing function should always be pre-assessed.
- **MRSA cover:** = both cefazolin and teicoplanin or vancomycin used.
  - Teicoplanin & vancomycin are less effective at preventing MSSA infections alone.
- Broad-spectrum antibiotics (e.g. ceftriaxone) are **not indicated** for prophylaxis, unless where appropriate treatment of a pre-existing infection is documented.
- **Recent relevant microbiology** culture results, including colonisation with multi-resistant bacteria, should be taken into account in antibiotic choices.
  - Contact the AMS/ID Team for advice. Call 0459 896 463 or page 60941.
- **There is no benefit for post-operative oral antibiotic prophylaxis.**

<table>
<thead>
<tr>
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<th>ALTERNATIVE IN BETA-LACTAM ALLERGY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central venous access</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implantable devices</td>
<td>cefazolin 2g +/- MRSA cover</td>
<td>clindamycin 600mg OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>teicoplanin 800mg OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vancomycin 15mg/kg</td>
</tr>
<tr>
<td><strong>Gynaecological: Uterine artery embolization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May not be routinely required</td>
<td>Amoxiclav 1.2g as per local guidelines</td>
<td>clindamycin 600mg AND gentamicin 2mg/kg</td>
</tr>
<tr>
<td><strong>Hepatic Chemoembolization/Radioembolization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May not be routinely required</td>
<td>cefazolin 2g</td>
<td>gentamicin 2mg/kg AND</td>
</tr>
<tr>
<td>(see CRGH TACE Guideline)</td>
<td></td>
<td>clindamycin 600mg OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>teicoplanin 800mg OR</td>
</tr>
<tr>
<td><strong>Biliary Drainage Procedure: PTC/PBD</strong></td>
<td></td>
<td>vancomycin 15mg/kg</td>
</tr>
<tr>
<td>Not necessarily required</td>
<td>ampicillin 2g + gentamicin 2mg/kg</td>
<td>gentamicin 2mg/kg AND</td>
</tr>
<tr>
<td>Contact the AMS/ID Team for advice regarding choices for complicated cases</td>
<td>If gentamicin contraindicated: Amoxiclav 1.2g as per local guidelines</td>
<td>clindamycin 600mg OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>teicoplanin 800mg OR</td>
</tr>
</tbody>
</table>

**References:**

Education & Training

• Presentations targeted at key stakeholders
  – Surgical Grand Rounds
  – One-on-ones with Surgeons & Anaesthetists
  – JMO & Pharmacy teaching
  – Mandatory Nurse education sessions

• Local guidelines in line with Therapeutic Guidelines: Antibiotic

• Contact for feedback

• Surgical AMS rounds
**Surgical Antibiotic Prophylaxis: general principles**

<table>
<thead>
<tr>
<th>Principle</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single dose</strong></td>
<td>Longer duration does NOT reduce SSI.</td>
</tr>
<tr>
<td>(Most Class I and Class II procedures)</td>
<td>Post-op antibiotic doses increases the risk of MRO colonisation &amp; C.diff colitis</td>
</tr>
<tr>
<td>There is no evidence to support continuing antibiotic prophylaxis until all drains/catheters are removed</td>
<td>Adequate antibiotic tissue concentration at the operative site before contamination → ↓ SSI</td>
</tr>
<tr>
<td><strong>Prior to surgical incision</strong></td>
<td>Adequate antibiotic tissue concentration at the operative site before contamination → ↓ SSI</td>
</tr>
<tr>
<td>Ideally 15-30min prior—see Figure 1 below</td>
<td></td>
</tr>
<tr>
<td><strong>Repeat intra-operative dose if surgery &gt; 4 hours</strong></td>
<td>Cephazolin has a short half-life</td>
</tr>
<tr>
<td><strong>If MRSA cover needed</strong></td>
<td>Both MSSA + MRSA require prophylaxis</td>
</tr>
<tr>
<td>= cephalosporin + vancomycin/teicoplanin</td>
<td>Staph aureus is the most common pathogen causing SSIs. For high risk procedures, decolonisation is recommended.</td>
</tr>
<tr>
<td><strong>Pre-op screening is effective</strong></td>
<td>Staph aureus is the most common pathogen causing SSIs. For high risk procedures, decolonisation is recommended.</td>
</tr>
</tbody>
</table>

**Figure 1.** The association between the timing of administration of prophylaxis and the incidence of surgical site infection (SSI) following laparoscopic cholecystectomy, using data from a single centre hospital. The SSI rate is significantly lower in patients who received prophylaxis before incision (p < 0.05).
Timing of surgical antimicrobial prophylaxis: a phase 3 randomised controlled trial


Summary

Background Based on observational studies, administration of surgical antimicrobial prophylaxis (SAP) for the prevention of surgical site infection (SSI) is recommended within 60 min before incision. However, the precise optimum timing is unknown. This trial compared early versus late administration of SAP before surgery.

Methods In this phase 3 randomised controlled superiority trial, we included general surgery adult inpatients (age <18 years) at two Swiss hospitals in Basel and Aarau. Patients were randomised centrally and stratified by hospital, surgical site, and surgical risk group. The primary outcome was SSI within 30 days.

Figure 1. The association between the timing of administration of prophylaxis and the incidence of surgical site infection (SSI) following high risk procedures, decontamination is recommended.
Monitor performance

• Next steps
  – Completing the post-intervention data analysis (looks positive)
  – Prospective audit data analysis
  – No post-op doses

• Electronic prescribing surveillance
  – Direct intervention
  – Collate data for feedback
Strategies

Governance & leadership

Engage key stakeholder (enablers & barriers)

Monitor performance

Education & training

**Peri-operative**
Anaesthetics, Surgeons, Theatre nurses

**Post-operative**
Ward nurses, CNCs, pharmacists, JMOs

Hospital/ward/unit level

Support & tools including guidelines

Exploring New Opportunities