Surgical Antimicrobial Prophylaxis Guidelines (adult)

Appendix 15: Thoracic Surgery

Preoperative Considerations

Consider individual risk factors for every patient including the need for prophylaxis. Antibiotic choice/dose may need to be modified according to patient factors (e.g. immune suppression, presence of prostheses, allergies, renal function, obesity, malnutrition, diabetes, malignancy, infection at another site, colonisation with multi-drug resistant bacteria and available pathology).

Consider surgical wound classification (**clean, clean-contaminated, contaminated, dirty-infected)** when determining the need for, or choice of, antibiotic prophylaxis. Refer to Surgical Antimicrobial Prophylaxis Prescribing Guideline for further information.

Pre-existing infections (known or suspected) – if present, use appropriate treatment regimen instead of prophylactic regimen for procedure but ensure the treatment regimen has activity against the organism(s) most likely to cause postoperative infection. Adjust the timing of the treatment dose to achieve adequate plasma and tissue concentrations at the time of surgical incision and for the duration of the procedure - seek advice from ID or the AMS team if unsure.

Prophylaxis against endocarditis is indicated for patients with specific cardiac conditions. Refer to Antibiotic Prophylaxis for Prevention of Endocarditis in High Risk Patients for further information.

Practice Points

Timing and administration of antibiotics

Surgical antibiotic prophylaxis must be administered before surgical incision to achieve effective plasma and tissue concentrations at the time of incision. Administration of any antibiotic after skin incision reduces effectiveness.

- IV **cefazolin** can be given over 5 minutes and should be administered no more than 60 minutes before skin incision.
- IV **metronidazole** infusion can be given over 20 minutes and should be fully administered within 120 minutes of surgical incision. Maximum plasma and tissue concentrations occur at the conclusion of the infusion.
- IV **vancomycin** infusion should be given at a rate of 1g over at least 60 minutes and 1.5g over at least 90 minutes. Vancomycin should be timed to begin 15 to 120 minutes before skin incision. This ensures adequate concentration at the time of incision and allows for any potential infusion-related toxicity to be recognised before induction. The infusion can be completed after skin incision.

Dosing in patients with obesity

- **Cefazolin**: Consider increased dose of cefazolin (3g) for adult patients weighing more than 120kg.
- **Vancomycin**: Consider increased dose of vancomycin (1.5g) for adult patients weighing more than 80kg.

High MRSA risk (defined as history of MRSA colonisation or infection OR frequent stays or a current prolonged stay in hospital with a high prevalence of MRSA OR residence in an area or aged care facility with high prevalence of MRSA OR current residence, or residence in the past 12 months, in a correctional facility):

- Add vancomycin

Repeat dosing

A single preoperative dose is sufficient for most procedures; however repeat intraoperative doses are advisable:

- for prolonged surgery (more than 4 hours from the time of first preoperative dose) when a short-acting agent is used (e.g. cefazolin dose should be repeated after 4 hours and clindamycin after 6 hours), OR
- if major blood loss occurs (e.g. more than 1500 mL in adults), following fluid resuscitation.

When measuring the time to a second intraoperative dose, measure the interval from the time of the first preoperative dose rather than the surgical incision time.

Recommended Prophylaxis

Procedure	Recommended Prophylaxis	High Risk Penicillin / Cephalosporin Allergy*
Intercostal catheter insertion **Brachiocephalic procedures (e.g. carotid endarterectomy, brachial artery repair) not involving prosthetic material**	Prophylaxis NOT recommended	
Procedures involving insertion of prosthetic material **Procedures associated with an increased risk of infection, including video-assisted thoracoscopic surgery (VATS), aneurysm repair, thromboendarterectomy, vein bypass, mediastinoscopy**	**cefazolin 2g** IV High risk of MRSA infection: **ADD vancomycin 1g** IV infusion (**1.5g** for patients more than 80kg **actual body weight**)	**vancomycin 1g** IV infusion (**1.5g** for patients more than 80kg **actual body weight**)

Recommended Prophylaxis

Procedure	Recommended Prophylaxis	High Risk Penicillin / Cephalosporin Allergy*
Pneumonectomy / Lobectomy **If infection present, continue with current antibiotic therapy**	**cefazolin 2g** IV THEN **cefazolin 2g** IV 8-hourly for 2 more doses commencing 8 hours after the initial dose *If anaerobic cover required (empyema or abscess) then* ADD: **metronidazole 500mg** IV infusion THEN **metronidazole 500mg** IV infusion for 1 more dose commencing 12 hours after the initial dose High risk of MRSA infection: **ADD vancomycin 1g** IV infusion (**1.5g** for patients more than 80kg **actual body weight**)	**vancomycin 1g** IV infusion (**1.5g** for patients more than 80kg **actual body weight**) THEN **vancomycin 1g** IV infusion (**1.5g** for patients more than 80kg **actual body weight**) for 1 more dose commencing 12 hours after the initial dose *If anaerobic cover required (empyema or abscess) then* ADD: **metronidazole 500mg** IV infusion THEN **metronidazole 500mg** IV infusion for 1 more dose commencing 12 hours after the initial dose
Decortication / Pleurectomy **If infection present, continue with current antibiotic therapy**	**cefazolin 2g** IV *If anaerobic cover required (empyema or abscess) then ADD:* **metronidazole 500mg** IV infusion High risk of MRSA infection: **ADD vancomycin 1g** IV infusion (**1.5g** for patients more than 80kg **actual body weight**)	**vancomycin 1g** IV infusion (**1.5g** for patients more than 80kg **actual body weight**) *If anaerobic cover required (empyema or abscess) then ADD:* **metronidazole 500mg** IV infusion

*High risk penicillin/cephalosporin allergy: History suggestive of high risk (e.g. anaphylaxis, angioedema, bronchospasm, urticaria, DRESS/SJS/TEN)

Postoperative Care

Except where included above, postoperative antibiotics are NOT indicated unless infection is confirmed or suspected, regardless of the presence of surgical drains. If infection is suspected, consider modification of antibiotic regimen according to clinical condition and microbiology results.

Definitions / Acronyms

AMS	Antimicrobial Stewardship	**DRESS**	Drug rash with eosinophilia and systemic symptoms
ID	Infectious Diseases	**IV**	Intravenous
MRSA	Methicillin-resistant *Staphylococcus aureus*	**SJS / TEN**	Stevens-Johnson syndrome / Toxic epidermal necrolysis

References

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