MEMORANDUM

To: All staff

From: AMS Pharmacist
Infectious diseases Physician

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Subject: Update on Antimicrobial Shortage:

Re-introduction of IV Piperacillin-Tazobactam & IV Gentamicin to empiric antibiotic guidelines

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Date: 23/04/2018

Dear staff,

Summary
There are sufficient stock levels in central pharmacy to support the *re-introduction of IV Piperacillin-Tazobactam and IV Gentamicin* into clinical use as per Metro South empiric antibiotic guidelines (See Appendix: Updated Empiric Antibiotic Guidelines). IV Piperacillin-Tazobactam and IV Gentamicin will again be available as ward imprest items to facilitate access. Access to IV Ceftriaxone (which was used as one of the alternative antibiotics during the shortage period) will now be restricted according to guidelines.

Situation
This memo updates the information regarding the shortages of IV Piperacillin-Tazobactam and IV Gentamicin and supersedes previous related memos 2017/PHAAB1 (09/10/17) "Immediate recall of Gentamicin 80mg/2mL ampoules" & 2017/PHAAB2 (12/10/17) "Upcoming National Shortage of IV Piperacillin/Tazobactam 4.5g vials.

Background
A global shortage of Piperacillin-tazobactam and a national recall of gentamicin ampoules in October 2017 prompted a revision of our empirical antibiotic guidelines.

Assessment
With the judicious prescribing and use of alternative regimens by our clinicians, the shortage of Piperacillin-Tazobactam has been largely mitigated to date. Central pharmacy has also been able to secure adequate stocks of IV Gentamicin ampoules.

Recommendation/Action that will be taken
- IV Piperacillin/Tazobactam 4.5g vials will be restocked to ward imprest of 2A, 2B, 3A, 3B, 4B, 5B, ICU, Emergency, Transit lounge, Endoscopy & Operating Suites
- IV Gentamicin 80mg/2mL ampoules will be restocked to ward imprest of 2A, 2B, 3A, 3B, 4B, 5B, ICU, Emergency, Transit lounge, Endoscopy, Operating suites, Urodynamics & Day surgery.
- IV Ceftriaxone 1g vials will be removed from most ward imprest shelves except [3B, ED, ICU, Endoscopy]

Document prepared by Dr Mandy Ng (Antimicrobial Stewardship Pharmacist) [Document adapted from PAH Memorandum 5/4/2018 Update on antimicrobial shortage]

Approved by: Dr David Looke (Infectious Diseases Physician); Dr John Parke (Director of Pharmacy)

APPENDIX: Updated Empiric Antibiotic Guidelines [Re-introduction of IV Piperacillin-Tazobactam & IV Gentamicin]

	Indication	Recommendation prior to shortage	Recommendation during shortage	Updated Recommendation
Sepsis	**Community acquired sepsis (Unknown origin)**	IV Flucloxacillin plus IV Gentamicin plus IV Vancomycin	IV Flucloxacillin **plus** IV Gentamicin (or Tobramycin) **plus** IV Vancomycin	IV Flucloxacillin **plus** IV Gentamicin **plus** IV Vancomycin
	Hospital acquired sepsis (unknown source)	IV Piperacillin/Tazobactam plus IV Vancomycin if patient known to be colonised with MRSA or have a central line in-situ	IV Ceftriaxone 2g daily **plus** IV Vancomycin Seek ID opinion for complicated patients	**IV Piperacillin-Tazobactam** 4.5g **8-hourly** [Add vancomycin for patients known to be MRSA colonised or have a central line in-situ]. Seek ID opinion for complicated patients
	Febrile neutropenia	IV Piperacillin/Tazobactam 4.5g 6-hourly plus IV Gentamicin	IV Piperacillin/Tazobactam 4.5g 6-hourly **plus** IV Gentamicin (or Tobramycin)	IV Piperacillin/Tazobactam 4.5g **6-hourly plus** IV Gentamicin
	Proven pseudomonas *sp* infection	IV Piperacillin/Tazobactam 4.5g 6-hourly	IV Piperacillin/Tazobactam 4.5g 6-hourly **(ID approval required)**	IV Piperacillin/Tazobactam 4.5g **6-hourly (ID approval required)**
Urological infections	**Urosepsis** **Acute pyelonephritis**	IV Ampicillin plus IV Gentamicin	IV Ceftriaxone 2g stat then IV Ceftriaxone 1g 12-hourly. Seek ID opinion: - if need to cover for pseudomonas aeruginosa, ESBL E coli or other multi-resistant organisms - for complicated urology patients - if patient has immediate penicillin hypersensitivity	IV Ampicillin plus IV Gentamicin For patients with penicillin hypersensitivity, omit ampicillin (use gentamicin as a single agent) If gentamicin is contraindicated, use IV piperacillin-tazobactam [Note: Dose adjustment may be required in renal impairment]
Respiratory tract infections	**Severe Community Acquired Pneumonia (CAP)**	IV Benzylpenicillin plus IV Gentamicin plus IV Azithromycin	IV Ceftriaxone 2g stat then 1g 12-hourly **plus** IV Azithromycin 500mg daily For immediate penicillin hypersensitivity, give a single agent IV/po Moxifloxacin 400mg daily	IV Benzylpenicillin **plus** IV Gentamicin **plus** IV Azithromycin For non-immediate penicillin hypersensitivity (or if there is contraindications to IV Gentamicin), Use IV Ceftriaxone 2g stat then IV 1g daily **plus** IV Azithromycin 500mg daily For immediate penicillin hypersensitivity, IV/PO Moxifloxacin 400mg daily as a single agent
	Hospital-acquired pneumonia (HAP)	IV Piperacillin/Tazobactam 4.5g 8-hourly	IV Ceftriaxone 2g stat then IV 1g daily	IV Piperacillin/Tazobactam 4.5g 8-hourly
	Aspiration pneumonia or HAP where anaerobic infection is suspected		IV Ceftriaxone 2g stat then IV 1g daily **plus** IV Metronidazole 500mg 12-hourly	
	Bronchiectasis (Infective exacerbation where pseudomonas aeruginosa is proven)			IV Piperacillin/Tazobactam 4.5g 6-hourly [**ID approval required**]

	Indication	Recommendation prior to shortage	Recommendation during shortage	Updated Recommendation
Intra-abdominal infections	**Peritonitis or cholangitis or severe diverticulitis or intra-abdominal collection**	Triple antibiotics IV Ampicillin plus IV Gentamicin plus IV Metronidazole	IV Ceftriaxone 2g stat then IV 1g 12-hourly **plus** po metronidazole 400mg 12-hrly*	Triple antibiotics IV Ampicillin **plus** IV Gentamicin **plus** IV Metronidazole If gentamicin is contraindicated or after 3 days (beyond 48 hrs) of gentamicin and Abx still required, cease gentamicin containing triple Abx regimen and change to IV **piperacillin/Tazobactam 4.5g 8-hourly** (consider 6-hourly in severe infection or weight > 100kg).
	Spontaneous bacterial peritonitis (SBP) in patients with ascites	IV Ceftriaxone 2g daily	IV Ceftriaxone 2g daily	IV Ceftriaxone 2g daily
	SBP in patients with ascites (and who are already on fluoroquinolone or trimethoprim+ sulfamethoxazole prophylaxis)	IV Piperacillin/Tazobactam 4.5g 8-hourly	IV Ceftriaxone 2g daily **plus** IV Benzylpenicillin 1.2g 6-hourly	IV Ceftriaxone 2g daily **plus** IV Ampicillin 1g 6-hourly **OR as a single agent**, use IV Piperacillin-Tazobactam 4.5g 8-hourly)
Skin, soft tissue and bone infections	**Bites (Moderate to severe established infection)**	IV Piperacillin/Tazobactam 4.5g 8-hourly	IV Ceftriaxone 2g stat then 1g 12-hourly **plus** po Metronidazole 400mg 12-hourly*	IV Piperacillin/Tazobactam 4.5g 8-hourly
	Open fractures [Gustilo open fracture classification III – severe tissue damage or clinical evidence of infection]	IV Piperacillin/Tazobactam 4.5g 8-hourly	IV Cefazolin 2g 8-hrly **plus** po Metronidazole 400mg 12-hourly*	IV Cefazolin 2g 8-hrly **plus** po Metronidazole 400mg 12-hourly*
	Diabetic foot infections	IV Piperacillin/Tazobactam 4.5g 8-hourly	IV Cefazolin 2g 8-hourly **plus** po metronidazole 400mg 12-hourly*	IV Cefazolin 2g 8-hourly **plus** po metronidazole 400mg 12-hourly* Seek ID opinion if antipseudomonal cover required
	Diabetic foot infections (osteomyelitis or severe limb or life threatening infection)			IV Piperacillin/Tazobactam 4.5g 8-hourly [Add vancomycin for patients known to be MRSA colonised]
Surgical prophylaxis	**General Surgical prophylaxis**	https://metrosouth.health.qld.gov.au/sites/default/files/content/surgical-prophylaxis-qe2.pdf		
	Urology Antibiotic prophylaxis	https://metrosouth.health.qld.gov.au/sites/default/files/content/qeii-urology-prophylaxis-guide.pdf		
	Gastro-intestinal endoscopy [ERCP with expected incomplete drainage (e.g. PSC, hilar strictures)			IV Cefazolin 2g (single dose only)
	Interventional radiology [Percutaneous transhepatic cholangiogram (with or without stent placement) with expected incomplete drainage (e.g. PSC, hilar strictures) or recent ERCP (within a week)]			IV Cefazolin 2g (single dose only)

Please contact infectious diseases for specific clinical situations that may require alternate antimicrobial therapy (e.g. where known/suspected multi-resistant organisms, immunosuppression, allergies, or other complicating factors)

*** PO metronidazole is recommended as it has excellent oral bioavailability (80%); where the PO route is not feasible, use metronidazole IV 500mg 12-hourly.**

Refer to the Metro South Antimicrobial Website & Guidelines for more information: https://metrosouth.health.qld.gov.au/clinician-resources/antimicrobial-prescribing-guidelines

See also the Metro South Gentamicin Guidelines for guidance on gentamicin dosing & administration: https://metrosouth.health.qld.gov.au/sites/default/files/content/msh-gentamicin-guidelines.pdf

Prepared by Antimicrobial Stewardship Pharmacist: Dr Mandy Ng [Document adapted from Memorandum 5/4/2018 Update on antimicrobial shortage]. Approved by Infectious Diseases Physician: Dr David Looke