DAILY INTEGRATION OF ANTIMICROBIAL STEWARDSHIP (DIAMS)

Quick Guide: IV To PO Antibiotics

GENERAL CONSIDERATIONS

Optimal time to switch from IV to PO antibiotic: **48 to 96 hours** after IV antibiotic initiation

If patient **deteriorate** clinically after the conversion from IV to PO, IV therapy should be reinitiated

If patient fulfill the following criteria, **MAKE** a **switch**!

M

Manifestation of clinical improvement

- Afebrile (36 - 38°C) for 48 hours
- C-reactive protein (CRP) trending down
- White cell count (WCC) 4-12* $x10^9/L$ or trending towards normal range
- No unexplained tachycardia (HR < 90 bpm)
- No unexplained hypotension (BP > 90/60 mmHg) and not vasopressor-dependent
- No tachypnoea (RR < 20 bpm)

*Examine the patient's medications for potential cause of increase/sustained high WCC (eg. steroids)

A

Able to tolerate oral therapy

- Not nil by mouth (NBM)
- Tolerating oral food or enteral feeding
- Oral absorption is not compromised by gastrointestinal conditions
- Good compliance, able to comply to oral medication at home

K

Known indication for prolonged course of IV therapy?

*Conditions **suitable** for IV to PO switch:*

- Pneumonia
- Skin & soft tissue infections
- Urinary tract infection
- Uncomplicated GNR bacteremia
- Intraabdominal infection without deep seated collections

*Conditions **not suitable** for IV to PO switch:*

- × Endocarditis
- × Central nervous system infections (eg. meningitis, brain abscess)
- × MSSA bacteremia or fungemia

*Conditions requiring **approval from ID physician** prior to IV to PO switch:*

- Osteomyelitis
- Septic arthritis
- Infected implant or prostheses
- Necrotising soft tissue infection
- Melioidosis
- Deep-seated infection (eg. abscesses, empyema)
- Complicated orbital cellulitis

E

Equivalent oral antibiotic option?

Yes, available (Refer to page 2-3)

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ANTIBIOTICS WITH EQUIVALENT ORAL OPTIONS (SEQUENTIAL THERAPY)

Drug	For adults with normal renal function		Bioavailability (BA)	Remarks
	IV dose	Equivalent oral dose		
Amoxicillin/ Clavulanate	1.2 g q8h	625 mg TDS	Amoxicillin: 80% Clavulanate: 30-98%	-
Ampicillin/ Sulbactam	1.5 g q8h 3 g q8h 3 g q6h	375 mg BD 375-750 mg BD 750 mg BD	80%	-
Azithromycin	500 mg q24h	500 mg OD	34-52%	BA compensated by good tissue penetration
Cefuroxime	750 mg q8h 1500 mg q8h	250-500 mg BD 500 mg BD	37-52%	250 mg for sinusitis/pharyngitis, superficial SSTI and uncomplicated UTI
Ciprofloxacin*	400 mg q12h 400 mg q8h	500 mg BD 750 mg BD	50-85%	-
Clindamycin	600 mg q8h 600 mg q6h 900 mg q8h	300 mg QID/ 600 mg TDS 600 mg QID 600 mg QID	~ 90%	300 mg QID for adult < 60 kg
Cloxacillin	500 mg q6h 1000 mg q6h 2000 mg q6h	250 mg QID 500 mg QID 1000 mg QID	~50%	250 mg for mild infections
Fluconazole	200 mg q24h 400 mg q24h 800 mg q24h	200 mg OD 400 mg OD 400 mg BD	> 90%	For opportunistic infections, dose may go up to 1200 mg/day
Levofloxacin*	500 mg q24h 750 mg q24h	500 mg OD 750 mg OD	~ 99%	Hold tube feeds 1H before & 2H after levofloxacin given.
Linezolid	600 mg q12h	600 mg BD	~100%	-
Metronidazole	500 mg q12h 500 mg q8h 750 mg q8h	400 mg BD 400 mg TDS 800 mg TDS	100%	Abstain from alcohol to avoid disulfiram-like reaction
Trimethoprim/ sulfamethoxazole	10-20 mg/kg/day (TMP)	10-20 mg/kg/day (TMP)	90-100%	-

* Space 2 hours before taking fluoroquinolones to avoid concomitant exposure to multivalent cations (Ca, Fe, Al, Mg, Zn) in dairy products, multivitamins and antacids. Cation chelate the drug and prevent absorption.

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Quick Guide: IV To PO Antibiotics

ANTIBIOTICS FOR SWITCH/STEP-DOWN THERAPY

For adults with normal renal function		Bioavailability (BA)
IV dose	**Step-down oral dose**	
Benzylpenicillin 1-2 mega units q6h 3-4 mega units q4-6h	**Phenoxymethylpenicillin** 250 mg QID/500 mg BD 500 mg QID or **Amoxicillin** 500 mg TDS	Phenoxymethylpenicillin: 60-73% Amoxicillin: 80%
Cefazolin 1 g q8h 2 g q8h	**Cephalexin** 500 mg QID 1000 mg QID	Cephalexin: 90%
Cefepime 2 g q8-12h	**Amoxicillin/Clavulanate** 625 mg TDS or **Sultamicillin** 750 mg BD	Amoxicillin: 80% Clavulanate: 30-98% Sultamicillin: 80%
	For definitive Pseudomonas infection: **Ciprofloxacin*** 500-750 mg BD	Ciprofloxacin: 50-85%
Cefoperazone 1-2 g q12h	**Amoxicillin/Clavulanate** 625mg TDS or **Sultamicillin** 375-750 mg BD or **Cefuroxime axetil** 500 mg BD	Amoxicillin: 80% Clavulanate: 30-98% Sultamicillin: 80% Cefuroxime axetil: 37-52%
Ceftazidime 2 g q6-8h	**Amoxicillin/Clavulanate** 625 mg TDS or **Sultamicillin** 750 mg BD	Amoxicillin: 80% Clavulanate: 30-98% Sultamicillin: 80%
	For definitive Pseudomonas infection: **Ciprofloxacin*** 500-750 mg BD	Ciprofloxacin: 50-85%
	For melioidosis: **Trimethoprim/Sulphamethoxazole** or **Amoxicillin/Clavulanate** Refer to **HSgB Antibiotic Guideline 2019** for weight-based dosing & duration of antibiotic	TMP/SMZ: 90-100% Amoxicillin: 80% Clavulanate: 30-98%
Ceftriaxone 1-2 g q24h	**Amoxicillin/Clavulanate** 625 mg TDS or **Cefuroxime axetil** 500 mg BD	Amoxicillin: 80% Clavulanate: 30-98% Cefuroxime axetil: 37-52%
Erythromycin Lactobionate 500 mg q6h 1000 mg q6h	**Erythromycin Ethylsuccinate** 400 mg QID 800 mg QID	Erythromycin: 18-45%
Piperacillin/Tazobactam 4.5 g q6-8h	**Amoxicillin/Clavulanate** 625 mg TDS or **Sultamicillin** 750 mg BD	Amoxicillin: 80% Clavulanate: 30-98% Sultamicillin: 80%
	For definitive Pseudomonas infection: **Ciprofloxacin*** 500-750 mg BD	Ciprofloxacin: 50-85%

* Space 2 hours before taking fluoroquinolones to avoid concomitant exposure to multivalent cations (Ca, Fe, Al, Mg, Zn) in dairy products, multivitamins and antacids. Cation chelate the drug and prevent absorption.

References:

1. Protocol on Antimicrobial Stewardship Program in Healthcare Facilities, MOH latest edition
2. Hospital Sungai Buloh Antibiotic Guideline 2019
3. National Antibiotic Guideline 2019, MOH latest edition

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