Alberta Health Services Pharmacy Services

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Antimicrobial Stewardship Backgrounder

Intravenous to Oral Antimicrobial Therapy Conversion

BOTTOM LINE: Converting patients' antimicrobial therapy from intravenous (IV) to oral (PO) administration has many patient and health system advantages including:[1,2]

- Shortened length of hospital stay
- Reduced risk of line-related infection and adverse events
- No IV related mobility restrictions for patients
- Decreased costs (↓ medication preparation and administration time, ↓ IV supplies, ↓ drug costs

IV to PO conversion is a simple but important antimicrobial stewardship strategy[3].

Two categories of antimicrobial therapy conversions:[1,4,5]

1. **Switch therapy:** Oral antimicrobial has rapid absorption and excellent oral bioavailability. Systemic exposure is comparable for oral and intravenous routes thus no advantage of IV over PO.
   → **Use oral therapy unless patient has oral absorption issues**
   → Initial oral therapy is appropriate (i.e., IV therapy does <u>not</u> have to be used initially)

2. **Step down therapy:** Systemic exposure is not equivalent for oral and intravenous routes.
   → **Converting therapy from IV to PO route requires individual patient assessment**
   → IV therapy can be switched to oral therapy once a patient is stable with improving clinical status (e.g., ↓white blood cell count, ↓ temperature, ↓ respiratory rate) and no oral absorption issues

Conditions that can result in potential oral absorption issues:[1]

- Shock
- Severe or persistent nausea/vomiting/diarrhea
- Active gastrointestinal (GI) bleeding
- Documented ileus or GI obstruction
- Shortened GI transit time (e.g., malabsorption syndromes, removal of part of GI tract, inflammatory bowel disease)
- Continuous tube feeding/nasogastric suctioning that cannot be interrupted for medication administration
- Drug interactions that would limit oral antimicrobial absorption

Did you know…
AHS has IV to PO therapeutic interchanges for **ciprofloxacin, clindamycin, levofloxacin**, and **metronidazole**. See on-line provincial drug formulary for details.

References

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IV to PO Conversion Recommendations[5,6]

Switch Therapy

Parenteral Therapy[α]	Cost ($)/Day[β]	Oral Therapy[α]	Cost ($)/Day[β]	Oral Bioavailability (%)
Ciprofloxacin 200-400 mg q12h	3.24 – 4.94	**Ciprofloxacin** 500-750 mg q12h	0.32 – 0.35	70
Clindamycin 600 mg q8h	25.59	**Clindamycin** 300-450 mg q6h	0.73 – 1.13	90
Fluconazole 400 mg daily	14.87	**Fluconazole** 400 mg daily	2.88	90
Levofloxacin 250-750 mg daily	4.98 – 13.59	**Levofloxacin** 250-750 mg daily	0.11 – 0.34	99
Linezolid 600 mg q12h	195.04	**Linezolid** 600 mg q12h	144.25	100
Metronidazole 500 mg q12h	3.38	**Metronidazole*** 500 mg q12h	0.25	100
Moxifloxacin 400 mg daily	17.51	**Moxifloxacin** 400 mg daily	4.00	89
Trimethoprim-sulfamethoxazole 160/800 mg q8h	38.60	**Trimethoprim-sulfamethoxazole** 1 DS tab q12h	0.21	85
Voriconazole 400 mg q12h x 2 doses then 200 mg q12h	571.80 285.90	**Voriconazole** 400 mg q12h x 2 doses then 200 mg q12h	41.54 20.77	96

* Excludes toxic megacolon.

α Usual adult dose with normal renal and hepatic function

β Inpatient drug costs. Parenteral therapy cost does not include the costs of IV administration or supplies

Step down Therapy[γ]

Parenteral Therapy[α]	Cost ($)/Day[β]	Oral Therapy[α]	Cost ($)/Day[β]	Oral Bioavailability (%)
Ampicillin 1-2 g q6h	18.00 – 36.00	**Amoxicillin** 500 mg q8h	0.19	80
Azithromycin 500 mg daily	8.32	**Azithromycin** 250 mg daily	0.64	37**
Cefazolin 1-2g q8h	2.33 – 4.65	**Cephalexin***** 500 mg q6h	0.46	90
Cefuroxime 0.75 – 1.5 g q8h	18.24 – 36.48	**Cefuroxime axetil** 0.5 – 1g q12h	1.84 – 3.68	52
Cloxacillin 1-2 g q6h	5.18 – 10.36	**Cephalexin** 500 mg q6h	0.46	90
Penicillin G 3-4 million units q6h	3.31 – 4.42	**Penicillin V** 300 mg q6h	0.18	60-73

** Low bioavailability but excellent distribution to tissues.

*** If a pathogen has been identified, ensure organism is susceptible to cephalexin.

α Usual adult dose with normal renal and hepatic function

β Inpatient drug costs. Parenteral therapy cost does not include the costs of IV administration or supplies.

γ Step down to oral therapy with these agents is not appropriate for certain infections due to severity or site of infection: endocarditis, meningitis, brain abscess, other central nervous system infections, orbital cellulitis, endophthalmitis and osteomyelitis[1].

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