Academic Detailing Service

Antibiotics Why and Why Not 2018

KEYS TO JUDICIOUS ANTIBIOTIC PRESCRIBING

Accurate diagnosis … Is it likely a bacterial infection? Are antibiotics indicated?

If so

Optimal treatment …What is the most appropriate antibiotic, dose and duration?

What are the side effects to the antibiotic?

Useful links:

Antibiograms: http://www.cdha.nshealth.ca/antimicrobial-stewardship-1

Antimicrobial handbook: http://www.cdha.nshealth.ca/antimicrobial-stewardship-3

IWK Health Centre's Spectrum: http://www.spectrum.md/iwk/

Acute pharyngitis – Adult Regimen

Antibiotic	Adult Regimen (Acute pharyngitis)	Cost /day
Penicillin V[1]	600mg BID	$0.81
Amoxicillin[2]	500mg BID	$0.68
Cephalexin	500mg BID	$0.90
Cefuroxime[3]	250 mg BID	$1.44
Clarithromycin[4]	250 mg BID	$0.82
Clindamycin[4]	300 mg TID	$1.41
Duration of therapy is 10 days for all regimens		

[1] Penicillin V preferred 1st line (narrow spectrum, safe and low cost). No documented resistance to GAS.

[2] Amoxicillin broader spectrum than required.

[3] 1st line option if patient **has experienced an IgE mediated amoxicillin reaction.**

[4] Alternatives in patients unable to take β-lactams. Increased GAS resistance to clindamycin and macrolides. Also concerns with risks of adverse effects (e.g. *C. difficile* with clindamycin).

Acute rhino-sinusitis – Adult regimen *~99% of cases are viral and do not require antibiotics!*

Antibiotic	Adult Regimen (acute rhino-sinusitis)	Cost per day
Amoxicillin	500mg TID – 1000mg BID	$1.02- $1.37
Amox/Clav[1]	500 mg TID or 875 mg BID	$1.56 - $2.01
Cefuroxime[2]	500 mg BID	$2.86
Clarithromycin[3]	500 mg BID	$3.26
Doxycycline[3]	200 mg for 1st dose, then 100 mg BID	$1.17
Levofloxacin	500 mg once daily	$1.51
Moxifloxacin	400 mg once daily	$1.52
Duration of therapy is 5 to 7 days **Expect symptoms to improve but not completely disappear at the end of therapy. Some persistence of symptoms is not an indication for immediate prescription for a second antibiotic.**		

[1] For patients who have not improved or who have failed therapy with amoxicillin.

[2] 1st line option if patient has a history of penicillin allergy (IgE mediated).

[3] Options if unable to use any β-lactam (*S. pneumoniae* is increasingly becoming resistant to tetracyclines and macrolides).

References are available in the document at http://www.medicine.dal.ca/departments/core-units/cpd/programs/academic-detailing-service.html
Costs listed are wholesale costs in Nova Scotia accessed online from McKESSON Canada in October 2018.

Acute exacerbation of COPD

Antibiotic	Adult Regimen (AECOPD)	Cost per day
Simple (low risk patient)		
Doxycycline	200 mg for 1st dose then 100 mg BID	$1.17
Amoxicillin	500 mg TID – 1000mg BID	$1.02 - $1.37
Cefuroxime	500 mg BID	$2.86
Clarithromycin[1]	500 mg BID	$3.26
Complicated (high risk) patients[2] or treatment failure[3]		
Amox/Clav	500 mg TID or 875 mg BID	$1.56 - $2.01
Levofloxacin	500 mg once daily	$1.51
Moxifloxacin	400 mg once daily	$1.52
Risk for *P. aeruginosa* (Previous isolation of *Pseudomonas*, advanced COPD, concomitant bronchiectasis, frequent/recent antimicrobial use)		
Ciprofloxacin[4]	500 mg BID	$1.00
Duration of therapy is usually 5 to 7 days. Expect symptoms to improve but not completely disappear at the end of therapy. Symptoms may not completely resolve for several weeks.		

[1]Clarithromycin: reserve for when allergy restricts use of other agents. It is less effective vs *H. influenzae* and *S.pneumoniae*.

[2] **Complicated** patients have any **one** of the following risk factors: FEV_1 < 50% predicted, ≥ 4 exacerbations per year, significant cardiac disease (e.g. ischemic heart disease, heart failure), use of home oxygen, use of chronic oral steroids.

[3] Clinical deterioration after 72 hours or no improvement with first line treatment.

[4]Poor coverage of *S. pneumoniae* and should not be routinely used in AECOPD.

Community acquired pneumonia- Adult regimen

CRB-65 score 0 plus O_2 sat > 92% on room air	**Can be treated as outpatients**	
Antibiotic	**Adult Regimen (CAP)**	**Cost per day**
Amoxicillin	1000 mg BID	$1.37
Doxycycline[1,2]	200 mg for 1st dose then 100 mg BID	$1.17
Cefuroxime[2]	500mg BID	$2.86
Levofloxacin[3]	750 mg once daily	$3.96 - $6.55
Moxifloxacin[3]	400 mg once daily	$1.52
Duration of therapy is usually 5-7 days		

[1] 1st line option if history is suggestive of a delayed, severe, non-IgE mediated hypersensitivity reaction to a β-lactam

[2] 1st line option if patient has a history of penicillin allergy (IgE mediated)

[3] 2nd line options in patients failing amoxicillin (worsening after 72 hours or no response after completion of therapy) and if there is no fluoroquinolone use in previous 3 months

CRB-65 score 1-2	**Consider admission to hospital ward**	
Antibiotic	**Adult Regimen (CAP)**	**Cost per day**
Amoxicillin	1000 mg BID	$1.37
Amox/Clav	875 mg BID	$1.56
Cefotaxime[1]	1000 mg Q8H IV	$24.99
Ceftriaxone[1]	1000 mg Q24H IV	$12.49
Levofloxacin[2]	750 mg once daily	$3.96 - $6.55
Moxifloxacin[2]	400 mg once daily	$1.52
Duration of therapy is usually 5-7 days		

[1] 1st line option if patient has a history of penicillin allergy (IgE mediated)

[2] 1st line option if β-lactam contraindicated

Acute uncomplicated cystitis (empiric outpatient therapy) – Adult regimen

Antibiotic[1]	Adult Regimen for EMPIRIC Therapy (acute uncomplicated cystitis)	Cost per course
Nitrofurantoin monohydrate macrocrystals[2]	100mg BID Women 5 days: Men 7 days	$7.86 - $11.00
TMP/SMX[3]	1 DS tab BID Women 3 days: Men 7 days	$0.72 - $1.68
Cephalexin	500mg QID Women 5-7 days: Men 7 days	$9 - $12.60
Amoxicillin-clavulanate	875 mg BID Women 5-7 days: Men 7 days	$7.75 – $10.85
Fosfomycin[4]	3 g X 1 dose (Women) 3 g every 72 hrs X 3 doses (Men)	$15.23 $45.69
Ciprofloxacin	250 mg BID Women 3 days: Men 7 days	$2.67 - $6.23

[1] Other antibiotics are appropriate if culture confirms susceptibility. Moxifloxacin should not be used because it does not attain sufficient concentration in the urine.

[2]Nitrofurantoin should not be used in patients with CrCl < 30 ml/min or in patients with pyelonephritis or prostatitis due to poor distribution into serum and tissue.

[3]TMP/SMX: Regular monitoring of kidney function and electrolytes are recommended for patients at risk of hyperkalemia, such as those with baseline renal **dysfunction,** an age > 65 years, prolonged duration of TMP/SMX therapy, concomitant therapy with angiotensin converting enzyme inhibitors, angiotensin receptor blockers, or potassium sparing diuretics (e.g. spironolactone).

[4] Fosfomycin should not be used in patients with pyelonephritis due to poor distribution into serum and tissue.

Cellulitis/Erysipelas – Adult regimen

Antibiotic	Adult Regimen (cellulitis/erysipelas)	Cost per day
MILD (Class 1, some Class 2*)		
Penicillin VK[1]	300-600mg PO QID	$0.81 - $1.62
Cephalexin	500mg PO QID	$1.80
Cefuroxime[2]	500mg PO BID	$2.86
Clindamycin[3]	300-450mg PO QID	$1.88 - $2.82
MODERATE (Class 2* or 3)		
Cefazolin[2,4]	**Inpatient:** 2g IV q8h **Outpatient:** 2g IV q12h & 1 g probenecid PO 30min before	$24.00
Cloxacillin[4]	2g IV q4h	$54.86
Ceftriaxone[4]	1g IV q24h	$12.49
Vancomycin[3,4]	15mg/kg IV q12h	$219.32/75 kg
Duration of therapy 5 days if mild and quick response, otherwise 7-10 days		
SEVERE (Class 4)		
Immediate expert consultation		
Broad spectrum antimicrobials		

[1] If erysipelas clinically established, does not cover MSSA

[2] 1st line empiric therapy if patient has IgE mediated penicillin allergy

[3] Option if unable to use any β-lactam

[4] Can transition to oral therapy when systemic symptoms resolved for >24 hours

*Oral or parenteral antibiotics may be used depending on the clinical scenario. Clinical judgment required.

Purulent SSTI (Cutaneous abscesses, Furuncles, Carbuncles) – Adult regimen

	Adult Regimens (Purulent SSTI)		
	NO MRSA CONCERNS		
	Antibiotic	**Adult regimen**	**Cost per day**
I & D	MILD (Class 1)		
	No antibiotics required		
	MILD (Class 1) with abscess diameter >2 cm or other INDICATION for antibiotic[1] or some Class 2*		
	Cephalexin	500mg QID	$1.80
	TMP-SMX[3]	1-2 DS tabs PO BID	$0.24 - $0.48
	Doxycycline[3]	200mg 1st dose then 100mg PO BID	$1.17
	Clindamycin[3]	300-450mg PO QID	$1.88 - $2.82
	MODERATE (Class 2* – 3)		
	Cefazolin[2,4]	**Inpatient:** 2g IV q8h **Outpatient:** 2g IV q12h & 1 g probenecid PO 30min before	$24.00
	Vancomycin[3,4]	15mg/kg IV q12hr	$219.32/75 kg
	Duration of therapy 7-10 days		
	SEVERE (Class 4)		
	Immediate expert consultation		
	Broad spectrum antibiotics		
	MRSA CONCERNS		
	History of MRSA colonization or infection Recent hospitalization	Injection drug use Poor response to initial antibiotics	
	Antibiotic	**Adult regimen**	**Cost per day**
I & D	MILD (Class 1)		
	No antibiotics required		
	MILD (Class 1) with abscess diameter > 2 cm or other INDICATION for antibiotic[1] or some Class 2*		
	TMP-SMX	1-2 DS tabs PO BID	$0.24 - $0.48
	Doxycycline	200mg 1st dose then 100mg PO BID	$1.17
	Clindamycin[5]	300-450mg PO QID	$1.88 - $2.82
	MODERATE (Class 2* – 3)		
	Vancomycin[4]	15mg/kg IV q12hr	$219.32/75 kg
	Duration of therapy 7-10 days		
	SEVERE (Class 4)		
	Immediate expert consultation		
	Broad spectrum antibiotics		

[1] May add antibiotic therapy if

- Multiple abscesses
- Lack of response to incision and drainage alone
- Extensive surrounding cellulitis
- Located where I & D difficult (Face, hands, groin)
- Extremes of age
- Impaired host defences
- Indwelling medical device at a non-contiguous site, isolated from infected field (e.g. pacemaker, vascular graph)

[2] 1st line empiric therapy if penicillin allergy (IgE mediated)

[3] Options if unable to use any β-lactam

[4] Can transition to oral therapy when systemic symptoms resolved for >24 hours

[5] Clindamycin remains a reasonable option for community-acquired MRSA which are more susceptible than hospital-acquired MRSA strains. Of 58 isolates tested across Canada, 88% were sensitive in 2015. Current local sensitivities to TMP-SMX and doxycycline are 93% and 100% respectively.

*Oral or parenteral antibiotics may be used depending on the clinical scenario. Clinical judgment required.