Drug Plan and Extended Benefits Branch

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SASKATCHEWAN FORMULARY COMMITTEE BULLETIN
SPECIAL REVIEW OF ANTIBIOTICS

The Saskatchewan Formulary Committee, assisted by the Drug Quality Assessment Committee, in consultation with provincial experts in infectious disease, respirology and pharmacology has completed a review of antibiotics currently covered under the Drug Plan. Concerns about the development of resistance specific to the Saskatchewan/Canadian population were considered.

In vitro susceptibility data does not always correlate with response to antimicrobial therapy. While local resistance patterns require consideration when selecting an appropriate antibiotic, strategies to slow or prevent further emergence of resistance are critical. Particularly, avoiding the use of antimicrobials for the treatment of viral infections, using narrow spectrum agents for specific infections (i.e. avoiding 'shotgun' broad spectrum therapy), patient education and promoting patient compliance with the full course of therapy should be adopted. It is important to focus on appropriate use of appropriate agents.

As a result of the Saskatchewan Formulary Committee review, changes were recommended to the Exception Drug Status criteria for some of the antibiotics. Antibiotics for which there is an Exception Drug Status (EDS) criteria change are listed in this Bulletin and the revised EDS criteria will be published in Appendix A of the 52nd Edition of the Saskatchewan Formulary. Products for which there was no change in EDS criteria continue to be listed in Appendix A of the Formulary. It should be noted that the Committee will continue to review new information on resistance patterns and antibiotic utilization as it is submitted to them.

All brands of cefaclor were recommended for delisting because, in general, other cephalosporins offer better treatment and resistance rates are lower. Delisting of the brands of cefaclor will become effective April 1, 2003.

The Drug Quality Assessment Committee and the Saskatchewan Formulary Committee express their appreciation to the consultants who assisted with this review.

INSIDE ... WALL CHART FOR ANTIBIOTIC SELECTION

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The following products have been **RECOMMENDED** under **EXCEPTION DRUG STATUS** according to the following **REVISED** criteria effective October 1, 2002**:**

It was noted that the criteria relating to the antibiotics should be used in conjunction with the revised 2002 Antibiotic Chart.

Amoxicillin trihydrate/potassium clavulanate, tablet, 875mg/125mg; oral suspension, 40mg/5.3mg/mL, 80mg/11.4mg/mL (Clavulin-GSK);
oral suspension, 25mg/6.25mg/mL, 50mg/12.5mg/mL (Clavulin-GSK) (Apo-Amoxi Clav-APX) (ratio-Amoxi Clav-RTP); tablet, 250mg/125mg, 500mg/125mg (Clavulin-GSK) (Apo-Amoxi Clav-APX) (ratio-Amoxi Clav-RTP)
For treatment of:

(a) Upper and lower respiratory tract infections in patients not responding to first-line antibiotics.
(b) Infections caused by organisms known to be resistant to or not responding to alternative antibiotics.
(c) Respiratory tract infections in nursing home patients.
(d) Pneumonia in patients in the community with comorbidity eg. chronic underlying lung disease (excluding asthma), diabetes mellitus, renal insufficiency, heart failure, stroke.
(e) Infection in patients with neutropenia.
(f) Pneumonia caused by aspiration.
(g) For human, cat and dog bites.
(h) Diabetic foot infections, and:
(i) For completion of treatment initiated in hospital.

Azithromycin, tablet, 250mg; oral suspension, 20mg/mL, 40mg/mL (Zithromax-PFI)
For treatment of:

(a) Pneumonia.
(b) Upper and lower respiratory tract bacterial infections known to be resistant to or not responding to alternative antibiotics.
(c) Infections in patients allergic to alternative antibiotics.
(d) Non-tuberculous *Mycobacterium* infections (and prophylaxis).
(e) *Chlamydia trachomatis* infections, and:
(f) For completion of treatment initiated in hospital with macrolides or quinolones.
(g) For patients intolerant to erythromycin and/or other antibiotics.

Azithromycin, tablet, 600mg (Zithromax-PFI)

For prophylaxis and treatment of non-tuberculous Mycobacterium infections.

Cefixime, tablet, 400mg; oral suspension, 20mg/mL (Suprax-AVT)
For treatment of:

(a) Infections in patients allergic to alternative antibiotics. *(Note: patients who have had an anaphylactic reaction to penicillin should not receive cephalosporins.)*
(b) Infections caused by organisms known to be resistant to or not responding to alternative antibiotics.
(c) Uncomplicated gonorrhea.

Cefprozil, tablet, 250mg, 500mg; suspension, 25mg/mL, 50mg/mL (Cefzil-BMY)
For treatment of:

(a) Upper and lower respiratory tract infections in patients not responding to first-line antibiotics.
(b) Infections caused by organisms known to be resistant or not responding to alternative antibiotics.
(c) Infections in patients allergic to alternative antibiotics. *(Note: patients who have had an anaphylactic reaction to penicillin should not receive cephalosporins.)*
(d) Respiratory tract infections in nursing home patients.
(e) Pneumonia in patients in the community with comorbidity e.g. Chronic underlying lung disease (excluding asthma), diabetes mellitus, renal insufficiency, heart failure, stroke, and:
(f) For completion of antibiotic treatment initiated in hospital.

Cefuroxime axetil, tablet, 250mg, 500mg; suspension, 25mg/mL (Ceftin-GSK), tablet, 250mg, 500mg (Ceftin-GSK) (ratio-Cefuroxime-RTP) (Apo-Cefuroxime-APX)
For treatment of:

(a) Upper and lower respiratory tract infections in patients not responding to first-line antibiotics.
(b) Infections caused by organisms known to be resistant or not responding to alternative antibiotics.
(c) Infections in patients allergic to alternative antibiotics. *(Note: patients who have had an anaphylactic reaction to penicillin should not receive cephalosporins.)*
(d) Respiratory tract infections in nursing home patients.
(e) Pneumonia in patients in the community with comorbidity i.e. Chronic underlying lung disease (excluding asthma), diabetes mellitus, renal insufficiency, heart failure, stroke, and:
(f) For completion of antibiotic treatment initiated in hospital.

Ciprofloxacin, tablet, 250mg, 500mg, 750mg; oral suspension, 100mg/mL (Cipro-BAY)
For treatment of:

(a) Infections caused by *Pseudomonas aeruginosa*.
(b) Infections in patients allergic to two or more alternative antibiotics.
(c) Infections known to be resistant to alternative antibiotics.
(d) Patients with severe diabetic foot infections in combination with other antibiotics.
(e) Infection (and prophylaxis) in patients with prolonged neutropenia.
(f) Genitourinary tract infections in patients allergic or not responding to alternative antibiotics.
(g) Patients with bronchiectasis or cystic fibrosis.
(h) Gonorrhea, and:
(i) For completion of antibiotic treatment initiated in hospital when alternatives are not appropriate.

Clarithromycin, tablet, 250mg, 500mg; oral suspension, 25mg/mL, 50mg/mL (Biaxin-ABB); extended-release tablet, 500mg (Biaxin XL-ABB)
For treatment of:

(a) Pneumonia.
(b) Upper and lower respiratory tract bacterial infections known to be resistant to or not responding to alternative antibiotics.

(c) Infections in patients allergic to alternative antibiotics.
(d) Non-tuberculous *Mycobacterium* infections (and prophylaxis), and:
(e) For one week for eradication of *H. pylori*-related infections when used in combination treatment regimens for the treatment of peptic ulcer disease.
(f) For completion of treatment initiated in hospital with macrolides or quinolones.
(g) For patients intolerant to erythromycin and/or other antibiotics.

Gatifloxacin, tablet, 400mg (Tequin-BMY)
For treatment of:
(a) Pneumonia in patients with underlying lung disease (excluding asthma) and pneumonia in nursing home patients.
(b) Infections caused by organisms known to be resistant to alternative antibiotics.
(c) Infections in patients allergic to two or more alternative antibiotics, and:
(d) For completion of antibiotic treatment initiated in hospital when alternatives are not appropriate.

Levofloxacin, tablet, 250mg, 500mg (Levaquin-JAN)
For treatment of:
(a) Pneumonia in patients with underlying lung disease (excluding asthma) and pneumonia in nursing home patients.
(b) Infections caused by organisms known to be resistant to alternative antibiotics.
(c) Infections in patients allergic to two or more alternative antibiotics, and:
(d) For completion of antibiotic treatment initiated in hospital when alternatives are not appropriate.

Moxifloxacin HCl, tablet, 400mg (Avelox-BAY)
For treatment of:
(a) Pneumonia in patients with underlying lung disease (excluding asthma) and pneumonia in nursing home patients.
(b) Infections caused by organisms known to be resistant to alternative antibiotics.
(c) Infections in patients allergic to two or more alternative antibiotics, and:
(d) For completion of antibiotic treatment initiated in hospital when alternatives are not appropriate.

Vancomycin HCL, capsule, 125mg, 250mg, (Vancocin-LIL) injection, 500mg, 1g (Vancocin-LIL) (pms-Vancomycin-PMS)
For treatment of:
Clostridium difficile infections for up to two consecutive two week periods after no response, allergies or intolerance to a course of metronidazole. *Repeat approvals will only be granted with laboratory evidence of C. difficile toxin.*

ANTIBIOTIC SELECTION WITHIN THERAPEUTIC CLASSES

In many cases antibiotics within therapeutic classes have similar antimicrobial spectra and provide equivalent therapeutic results. The differences between them are often pharmacokinetic in nature.

Penicillins – Ampicillin and amoxicillin have similar antimicrobial spectra and are similarly priced. Amoxicillin is generally preferred over ampicillin because it is better absorbed, requires fewer doses per day, can be taken with meals and may cause less diarrhea. Amoxicillin in combination with clavulanic acid markedly enhances its use in penicillin resistant infections.

Macrolides – A number of different formulations of erythromycin are listed which have been designed to reduce acid degradation and increase absorption. Gastrointestinal intolerance is a problem with erythromycin; the incidence is lower with clarithromycin and azithromycin. Clarithromycin and azithromycin also cover a broader spectrum of organisms, including *H. influenzae, Mycobacterium sp*, and *H. pylori*, but do not offer an advantage over erythromycin against penicillin resistant *Streptococcus pneumoniae*. These drugs are administered once or twice daily but are significantly more expensive than erythromycin.

Tetracyclines – The tetracyclines all have similar antimicrobial activity. Minocycline causes a high incidence of vestibular toxicity which has limited its use. Doxycycline has better gastrointestinal absorption, and higher tissue concentrations than tetracycline. It has a mechanism of elimination that is independent of renal function and causes less diarrhea. Doxycycline is preferred in patients with renal dysfunction. It (like minocycline) can be taken without regard to meals, whereas tetracycline should be taken on an empty stomach.

Oral Cephalosporins – There are now first (cephalexin), second (cefprozil, cefuroxime) and third (cefixime) generation cephalosporins listed in the Saskatchewan Formulary. All brands of cefaclor were recommended for delisting as other cephalosporins offer better treatment and resistance rates are lower. Spectrum of activity and pharmacokinetic characteristics of the cephalosporins vary considerably. These drugs should be considered individually and selected on the basis of their spectrum of activity and route of administration. Generally the cephalosporins are well tolerated and have a wide spectra of activity with overall safety.

Fluoroquinolones –Ciprofloxacin provides oral therapy for gram-negative infections which previously required parenteral therapy, while gatifloxacin, levofloxacin and moxifloxacin have enhanced activity against *Streptococcus pneumoniae* and cover many of the pathogens causing respiratory tract infections. Ciprofloxacin is the most potent agent against *Ps. aeruginosa* although culture and sensitivity testing should be done as there is increasing resistance in Saskatchewan. Oral quinolones have bioavailability approaching IV administration. Differences exist among the quinolones with respect to the need to adjust doses in renal impairment and the potential for various drug interactions. **There is, however, a very real concern regarding the significant reliance on these agents for community-acquired infections. Overuse will lead to resistance in both gram positive and gram negative organisms making these agents less useful when required for hospitalized patients.** World wide development of resistance to quinolones is a concern due to their escalating use.

Saskatchewan Health

SASKATCHEWAN FORMULARY COMMITTEE
Supplement to Bulletin #92 - October, 2002
SELECTION OF ANTIMICROBIAL DRUGS

A revised update of the antibiotic chart and Bulletin is complete. The Saskatchewan Formulary Committee and the Drug Quality Assessment Committee appreciate the valuable contribution offered by the members of the Special Review Committee on Antibiotics. The committee members included a family physician, a pediatrician, a pharmacologist, internal medicine specialists in infectious disease and respirology, and clinical pharmacists with expertise in infectious disease.

PRINCIPLES OF ANTIMICROBIAL DRUG SELECTION

There is national and international concern regarding the rising incidence of resistance to antimicrobial agents.

Strategies to combat this problem include:

- **Community-based monitoring of resistance;**
- **Avoiding antimicrobial agents to treat viral infections;**
- **Use of narrow spectrum antimicrobial agents;**
- **Encouraging patient compliance.**

The determination of rational and effective antimicrobial therapy involves the consideration of:

- **Focus of infection**: the possible causative organisms and most effective classes of antimicrobial agents can then be identified. Gram stains and culture and sensitivity data should be obtained if possible.

- **Local susceptibility patterns** of the possible organisms involved: the incidence of antibiotic resistance in the community setting helps determine the antibiotic of choice.

- **Host factors or the variations in patient response:** these include the patient's history of allergy or adverse reactions, immunologic status, age, pregnancy, underlying disease states and hepatic or renal function.

- **Treatment setting:** in the ambulatory setting low toxicity and ease of administration (usually the oral route) are the important factors to consider. As well, using drugs which require less frequent administration may improve compliance.

- **Cost:** this is important when efficacy and toxicity are similar between antibiotics.

ANTIBIOTIC CHOICES FOR COMMON INFECTIOUS DISEASES

	CLINICAL	MODIFYING CIRCUMSTANCES	PROBABLE ORGANISMS	ANTIBIOTIC SELECTION		COMMENTS
				First line	Second line	
SKIN AND SOFT TISSUE	IMPETIGO Bullous and non-bullous	ADULT & CHILD	*Group A Strep.* *S. aureus*	Mupirocin 2%◆ Fusidic acid 2%◆ Cloxacillin Cephalexin	Erythromycin Clindamycin Clarithromycin*(if intolerant to erythromycin)	Switch to penicillin V if culture shows *Group A Strep*. Topical treatment if not widespread
	FOLLICULITIS FURUNCULOSIS	BOILS	*S. aureus*	No treatment Self limiting	Mupirocin 2% ◆ Fusidic acid 2% ◆	**Systemic therapy does not always shorten treatment.** Folliculitis due to *S. aureus* can be treated topically. *Pseudomonas* folliculitis occurs in contaminated hot tubs. Carbuncles are deeper requiring drainage. No need to remove crust.
	CARBUNCLES	Moderate to severe	*S. aureus*	Cephalexin Cloxacillin	Clindamycin Erythromycin Clarithromycin * (If intolerant to erythromycin)	
	CUTANEOUS INFECTIONS (e.g. perianal abscess, decubitus ulcers)	Complicated	*Polymicrobial*	TMP-SMX or Ciprofloxacin* ± metronidazole or clindamycin	AM/CL*	Incision/surgical drainage, debride, Avoid topical antibiotic therapy TMP-SMX should not be used if *Pseudomonas* present then use ciprofloxacin. Anaerobes are present depending on locale of ulcer
	ERYSIPELAS	ADULT & CHILD	*Group A Strep*	Penicillin V Cephalexin	AM/CL * Clindamycin	Debride lesions. 10 day treatment
	CELLULITIS	ADULT & CHILD Mild-moderate, uncomplicated, non-facial	*Group A Strep* *S. aureus* *H. influenzae (child)*	Cephalexin Cloxacillin Cefprozil* (child) Cefuroxime*	Erythromycin Clindamycin Clarithromycin* (If intolerant to erythromycin)	Pen V or amoxicillin if known to be *Group A Strep* IV therapy maybe required if rapidly progressive, severe or facial
		DIABETIC FOOT Mild to moderate (in setting of chronic ulceration)	*S. aureus* *Group A & B Strep* *Enterococci* *Mixed aerobic & anaerobes* *Pseudomonas*	TMP/SMX + Metronidazole or Cephalexin + metronidazole AM/CL*	TMP/SMX & Clindamycin Clindamycin or metronidazole and Ciprofloxacin *	If *Pseudomonas*, use Ciprofloxacin. Minimum 10 day treatment. For severe cellulitis, DO NOT use Cipro alone; add Metronidazole or Clindamycin
	CAT BITES	Mild infection	*P. multocida* *S. aureus* *Group A Strep, oral anaerobes*	AM/CL *	TCN Doxycycline	*P. multocida* is resistant to erythromycin, clindamycin & 1st generation cephalosporins & cloxacillin. Ensure tetanus prophylaxis is up to date. Consider rabies prophylaxis if bite unprovoked.
	HUMAN BITES		*As above +* *Enterobacteriaceae* *E. Corrodens*	AM/CL*	Doxycycline	
	DOG BITES		*P. multocida* *Strep viridans* *Others*	AM/CL *	TCN Doxycycline	
	ACUTE RHINITIS		*Viral*	None	None	
UPPER RESPIRATORY TRACT	SINUSITIS (acute bacterial)	ADULT & CHILD	<u>*Common*</u>*:* *S. pneumoniae* *H. influenzae* *M. catarrhalis* *Group A Strep* *Resp viruses*	Amoxicillin (adult & child) TMP/SMX (adult)	AM/CL * Doxycycline Cefprozil* Cefuroxime* Cefixime* ER/SX (child) Erythromycin Clarithromycin * Azithromycin *(if intolerant to erythromycin)	Treat 10-14 days. 40% respond without antibiotics. If > 10-30 days, then look at structural defects. CHRONIC SINUSITIS-may need 2-4wk treatment Increasing resistance to TMP/SMX for both S.pneumoniae and H. influenzae Decongestants may be useful (topical <5 days)
	OTITIS MEDIA	ACUTE ADULT & CHILD	<u>*Common:*</u> *S. pneumoniae* *H. influenzae* *M. catarrhalis* *Viruses*	<u>Adult:</u> Amox <u>Ped:</u> Amox	<u>Adult:</u> TMP/SMX AM/CL * Doxycycline Cefprozil* Cefuroxime* Cefixime * Clarith * Azith * <u>Ped:</u> TMP/SMX AM/CL * Cefprozil* Cefurox* Cefixime * ER/SX Clarith* Azith*	Do not use erythromycin alone as it does not cover *H. influenzae* Increasing resistance to TMP/SMX for *S. pneumoniae* and *H. influenzae* Amoxicillin dose should be 80-90mg/kg per day in patients at high risk of drug resistant *S.pneumoniae* (in children 2 years & younger in daycare or who have had antibiotics in the past 3 months). Acute otitis media may warrant watchful waiting for 48-72 hours before starting antibiotic therapy in previously healthy children over age 2 years due to a high (80-90%) spontaneous recovery rate.
		CHRONIC suppurative ADULT & CHILD	*Polymicrobial* *S. aureus* *Proteus sp.* *Klebsiella sp.* *E.coli* *B. fragilis* *P. aeruginosa*	FramycetinSO4/ Gramicidin/Dexamethasone (Sofracort drops) GentamicinSO4/ Betamethasone (Garasone drops) (Cipro HC if tympanic membrane is perforated)	Polymyxin B SO4/Bacitracin (Zinc)/NeomycinSO4/ Hydrocortisone (Cortisporin drops) Oral—same as for AOM	Topical treatment unsuccessful without careful cleaning of external canal. Limit topical aminoglycosides to 7 days therapy & do not use in a dry middle ear with perforation.
	PHARYNGITIS TONSILLITIS (acute)	80-90%	*Viral*	None	None	
		CHILD 5-15 yoa	*Group A Strep*	Penicillin V Amoxicillin	Erythromycin Cephalexin	Treat for 10 days
		ADULTS	*Group A Strep* *M. pneumoniae* *C. pneumoniae*	Penicillin V	Erythromycin Cephalexin Clarithromycin * Azithromycin * (if intol. to erythro)	Treat for 10 days
	LARYNGITIS		*Viral*	None	None	

<u>Key:</u>

AM/CL = Amoxicillin/Clavulanate
TMP/SMX = Trimethoprim/Sulfamethoxazole
CEPH2 = 2nd generation cephalosporin i.e. Cefprozil or cefuroxime axetil
◆ = Topical
ER/SX = Erythromycin/Sulfisoxazole
TCN = Tetracycline
FQ = Fluoroquinolone
* = Exception Drug Status

Note: Where EDS drugs are recommended in the first line column, EDS criteria as outlined in Appendix A to the Formulary must be met.

ANTIBIOTIC CHOICES FOR COMMON INFECTIOUS DISEASES

	CLINICAL	MODIFYING CIRCUMSTANCES	PROBABLE ORGANISMS	ANTIBIOTIC SELECTION		COMMENTS
				First line	Second line	
LOWER RESPIRATORY TRACT	ACUTE BRONCHITIS	Adult or Child	*Viral (80%)*	None		Current literature does not support the use of antibiotics to treat
		Purulent sputum or symptoms > 2 weeks (bacterial)	*Bacterial 10-20%* *C. pneumoniae* *M. pneumoniae* *B. pertussis*	Doxycycline Erythromycin	Tetracycline Clarithromycin * Azithromycin *	
	BRONCHIOLITIS	Child 10 months to 2 years	*RSV (50%)*	None		Consider Ribavirin for in-patients who are immunocompromised or have birth defects.
	ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)	Without risk factors	*50% non-bacterial* *S. pneumoniae* *H. influenzae* *M. catarrhalis* *M. pneumoniae* *C. pneumoniae*	Doxycycline TMP/SMX Amoxicillin	TCN AM/CL * Cefprozil* Cefuroxime* Erythromycin Clarithromycin * Azithromycin *	Risk factors: FEV<50% predicted, age over 65, comorbid medical illness (CHF, DM, CRF, Chronic liver disease), chronic steroid use, antibiotics in previous 3 months, 4 or >exacerbations/yr. TCN & erythromycin effective against *Mycoplasma*. DO NOT use erythromycin alone in *H. influenzae*. Smoking cessation useful. Vaccinate against *S.pneumoniae* and influenza
		With risk factors (see comments)	*S. pneumoniae* *H. influenzae* *M. catarrhalis* *M. pneumoniae* *C. pneumoniae*	TMP/SMX or AM/CL* or Cefprozil* or Cefuroxime* plus erythromycin Clarithromycin* or Azithromycin* (if intolerant to erythro)	Levofloxacin* Gatifloxacin* Moxifloxacin* (ciprofloxacin)	See risk factors above DO NOT use erythromycin alone in *H. influenzae*. Other: smoking cessation, vaccinate against *S. pneumoniae* and influenza Use Cipro only if *Pseudomonas* is present
	WHOOPING COUGH	Adult & Child	*Bordetella pertussis*	Erythromycin (erythromycin estolate in children)	TMP/SMX Clarithromycin* Azithromycin*(if intolerant to erythromycin)	Contact public health Treatment for 10 days Must start within 3 weeks of symptoms onset Cleared from nasopharynx after 3 weeks
	PNEUMONIA	COMMUNITY (Mild to moderate, no comorbidity or risk factors)	*S. pneumoniae* *C. pneumoniae* *M. pneumoniae* *H. influenzae*	Erythromycin Clarithromycin * Azithromycin *	Doxycycline TCN	10% *pneumococci* resist TCN. If *Legionella*, add erythromycin or use clarithromycin or azithromycin alone. Note: low incidence of *Legionella* in Sask. Risk factors: COPD, antibiotic or steroid use in past 3 months Increasing resistance to TMP/SMX for *S. pneumoniae* and *H. influenzae* If macroaspiration use AM/CL or add metronidazole or clindamycin Pneumococcal vaccination recommended as per current guidelines
		NURSING HOME OR COMMUNITY (Mild to moderate with risk factors)	*As above plus* *Gram(-) bacilli*	Cefprozil* or Cefuroxime* PLUS erythromycin or _____ Clarithromycin* or Azithromycin*	Levofloxacin* Gatifloxacin* Moxifloxacin*	
URINARY TRACT	CYSTITIS (acute)	Acute-uncomplicated-females	*E.coli* *S. saprophyticus* *Gram(-) bacilli*	TMP/SMX Trimethoprim Nitrofurantoin	Amoxicillin Norfloxacin * Ciprofloxacin * Cephalexin AM/CL *	Expensive agents only when conventional agents contraindicated because of resistant organisms, side effects or allergies 3 days treatment adequate EXCEPT with betalactams or nitrofurantoin
		Acute-pregnant women	*E. coli* *Klebsiella* *Proteus* *Enterococci*	Amoxicillin Cephalexin Nitrofurantoin	TMP/SMX Trimethoprim Fosfomycin Pivmecillinam	AVOID TMP/SMX in last 6 weeks because displacement of bilirubin. NO Fluoroquinolones Avoid nitrofurantoin at term (36-42 weeks) & during labor 3 day treatment, (not for betalactams or nitrofurantoin) with follow-up cultures
		Recurrence < 1 month Recurrence ≥ 3 episodes/year	*E. coli* *S. saprophyticus* *Gram(-) bacilli*	TMP/SMX Trimethoprim Nitrofurantoin	Norfloxacin * Ciprofloxacin * Cephalexin	Retreat for 10-14 days based on cultures Reassess at 6 months Longterm lowdose TMP/SMX will not cause resistance Post coital prophylaxis with TMP/SMX Macrobid better tolerated than Nitrofurantoin
	PYELONEPHRITIS	Uncomplicated, mild	*E. coli* *K. pneumoniae* *Enterobacter* *P. mirabilis*	TMP/SMX Ciprofloxacin *	AM/CL * Levofloxacin* Gatifloxacin*	Treat for 14 days Use ampicillin or amoxicillin if *enterococci*
GENITAL TRACT	PROSTATITIS	ACUTE BACTERIAL mild to moderate	*E. coli* *S. aureus* *Gram(-) bacilli* *Enterococcus faecalis*	TMP/SMX Trimethoprim Norfloxacin * Ciprofloxacin *		Treat for 4 – 6 weeks. Reassess if no improvement after 2 weeks. Chronic infection may also be due to *Pseudomonas.*
	EPIDIDYMO-ORCHITIS	< 35 yoa	*Gonococcus* *C. trachomatis*	as for gonorrhea		
		> 35 yoa	*E. coli* *Other Gram(-) bacilli*	TMP/SMX	Ciprofloxacin * AM/CL*	
	GONORRHEA	Uncomplicated cervicitis, urethritis, vaginitis, anorectal infection	*N. gonorrhea*	Cefixime* Ceftriaxone im.	Ciprofloxacin* Norfloxacin *	Diagnosis based on laboratory investigations. All patients with *N. gonorrhea* should be treated for presumptive co-existing *Chlamydia* (Doxycycline or Azithromycin).
	NONGONOCOC-CAL URETHRITIS/ CERVICITIS		*C. trachomatis*	Azithromycin*	Doxycycline Tetracycline Erythromycin	
	PELVIC INFLAMMATORY DISEASE	Outpatient	*N. gonorrhea* *C. trachomatis* *E. coli* *Anaerobic* *E. agalactiae*	Cefixime or Ceftriaxone plus doxycycline		