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
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.
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 CHALLENGE FOR COMMON INFECTIOUS DISEASES

<table>
<thead>
<tr>
<th>Clinical</th>
<th>Modifying Circumstances</th>
<th>Probable Organisms</th>
<th>Antibiotic Selection</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SKIN AND SOFT TISSUE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IMPETIGO</strong></td>
<td>Bullous and non-bullous</td>
<td>Group A strep. S. aureus</td>
<td>Mupirocin 2%&lt;br&gt;Fusidic acid 2%&lt;br&gt;Cloxacillin Cephalaxin</td>
<td>Erythromycin Cefaclor Clindamycin Clindamycin* (if intolerant to erythromycin)</td>
</tr>
<tr>
<td><strong>FOLLICULITIS</strong></td>
<td>Boils</td>
<td>S. aureus</td>
<td>No treatment, stuff limiting</td>
<td>Mupirocin 2%&lt;br&gt;Fusidic acid 2%&lt;br&gt;Cloxacillin Cephalaxin</td>
</tr>
<tr>
<td></td>
<td>Furunculosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carbuncles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moderate to severe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CUTANEOUS INFECTIONS</strong></td>
<td>(e.g. perianal abscess, erythema nostris ulcers)</td>
<td>Complicated</td>
<td>Polymicrobial</td>
<td>TMP/SMX or Ciprofloxacin*&lt;br&gt;Metronidazole or clindamycin</td>
</tr>
<tr>
<td><strong>ERYSPHELAS</strong></td>
<td>Adult &amp; Child</td>
<td>Group A strep.</td>
<td>Penicillin V</td>
<td>AM/CL*&lt;br&gt;Clinidamycin</td>
</tr>
<tr>
<td><strong>CELLULITIS</strong></td>
<td>Adult &amp; Child</td>
<td>Mild-moderate, uncomplicated, non-facial</td>
<td>Cephalaxin Cefaclor* (child) Cefuroxime*</td>
<td>Erythromycin Clindamycin Clindamycin* (if intolerant to erythromycin)</td>
</tr>
<tr>
<td></td>
<td>Chronic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DIABETIC FOOT INFECTION</strong></td>
<td>Mild to moderate (in setting of chronic ulceration)</td>
<td>Group A &amp; B strep. Aerococci Mixed aerobic &amp; anaerobes Pseudomonas</td>
<td>TMP/SMX + Cefuroxime*&lt;br&gt;Cephalaxin Cefaclor* (child) Cefuroxime*&lt;br&gt;Metronidazole</td>
<td>AM/CL*&lt;br&gt;Clinidamycin</td>
</tr>
<tr>
<td><strong>CAT BITES</strong></td>
<td>Mild infection</td>
<td>P. multocida</td>
<td>AM/CL*</td>
<td>TCN Dosycycline</td>
</tr>
<tr>
<td></td>
<td>Human bites</td>
<td>As above + E. coli Entero bacteriaeae F. coli</td>
<td>AM/CL*</td>
<td>Doxycycline</td>
</tr>
<tr>
<td><strong>HUMAN BITES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DOG BITES</strong></td>
<td>P. multocida</td>
<td>AM/CL*</td>
<td>TCN Dosycycline</td>
<td></td>
</tr>
<tr>
<td><strong>ACUTE RHINITIS</strong></td>
<td>Upper Respiratory Tract</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SINUSITIS</strong></td>
<td>Acute bacterial</td>
<td>Adult &amp; Child</td>
<td>Common: S. pneumoniae H. influenzae M. catarrhalis</td>
<td>Amoxicillin (adult &amp; child)</td>
</tr>
<tr>
<td></td>
<td>Chronic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OTTITIS MEDIA</strong></td>
<td>Acute adult &amp; child</td>
<td>Common: S. pneumoniae H. influenzae M. catarrhalis Viruses</td>
<td>Adult Amoxicillin Pedi Amoxicillin</td>
<td>AM/CL*&lt;br&gt;Doxycycline Cefuroxime*&lt;br&gt;Cefalexin ER/SX (child) Erythromycin Clindamycin Clindamycin* (if intolerant to erythromycin)</td>
</tr>
<tr>
<td></td>
<td>Chronic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PHARYNGITIS</strong></td>
<td>Tonsillitis</td>
<td>Adult 5-15 yoa</td>
<td>Pseudomonas V. Pseudomonas</td>
<td>Erythromycin Cephalaxin Penicillin V</td>
</tr>
<tr>
<td><strong>ADULTS</strong></td>
<td>Group A strep</td>
<td></td>
<td>Erythromycin</td>
<td>Clindamycin</td>
</tr>
<tr>
<td></td>
<td>Group B strep</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LARYNGITIS</strong></td>
<td>Viral</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

**Key:**
- AM/CL = Amoxicillin/Clavulanate
- TMP/SMX = Trimethoprin/Sulfamethoxazole
- CEPH = 1st generation cephalosporin i.e. Cephrizin or cefuroxime axetil
- ER/SX = Erythromycin/Sulfasaxazole
- FO = Fluoroquinolones
- TCN = Tetracycline
- * = Topical
- = 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.
<table>
<thead>
<tr>
<th>LOWER RESPIRATORY TRACT</th>
<th>CLINICAL</th>
<th>MODIFYING CIRCUMSTANCES</th>
<th>PROBABLE ORGANISMS</th>
<th>ANTIBIOTIC SELECTION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACUTE BRONCHITIS</td>
<td>Adult or Child</td>
<td>Viral (80%)</td>
<td>None</td>
<td>Current literature does not support the use of antibiotics to treat.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Purulent sputum or symptoms &gt; 2 weeks (bacterial)</td>
<td>Bacterial 10-20% C. pneumoniae M. pneumoniae B. pertussis</td>
<td>Doxycycline Erythromycin Tetracycline Clarithromycin * Azithromycin *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRONCHIOLITIS</td>
<td>Child 10 months to 2 years</td>
<td>RSV (50%)</td>
<td>None</td>
<td>Consider Ribavirin for in-patients who are immunocompromised or have birth defects.</td>
<td></td>
</tr>
<tr>
<td>ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)</td>
<td>Without risk factors</td>
<td>50% non-bacterial S. pneumoniae H. influenzae M. catarrhalis M. pneumoniae C. pneumoniae</td>
<td>Doxycycline TMP/SMX Amoxicillin TCN AM/CL * Ceftriaxone* Cefuroxime* Clarithromycin * Azithromycin *</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>With risk factors (see comments)</td>
<td>S. pneumoniae H. influenzae M. catarrhalis M. pneumoniae C. pneumoniae TMP/SMX or AM/CL * Amoxicillin PLUS erythromycin or Clarithromycin* or Azithromycin* (if intolerant to erythromycin)</td>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHOOPING COUGH</td>
<td>Adult &amp; Child Bordetella pertussis</td>
<td>Erythromycin (erythromycin estolate in children)</td>
<td>TMP/SMX Clarithromycin* Azithromycin* (if intolerant to erythromycin)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact public health Treatment for 10 days Must start within 3 weeks of symptoms onset Cleared from nasopharynx after 3 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PNEUMONIA</td>
<td>COMMUNITY (Mild to moderate, no comorbidity or risk factors) S. pneumoniae M. pneumoniae H. influenzae</td>
<td>Erythromycin Clarithromycin * Azithromycin * Dicloxacillin TCN 10% pneumococcal resist TCN. If Legionella, add erythromycin or use clarithromycin or azithromycin alone. Note: low incidence of Legionella in Sask.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NURSING HOME OR COMMUNITY (Mild to moderate with risk factors) As above plus Gram(-) bacilli Colpsozil* or Cefuroxime* PLUS erythromycin or Clarithromycin* or Azithromycin* Levofloxacin* Gatifloxcin* Moxifloxacin* (ciprofloxacin) 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</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CYSTITIS (acute)</td>
<td>Acute- uncomplicated-females E. coli S. saprophyticus Gram(-) bacilli</td>
<td>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</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute-pregnant women E. coli Klebsiella Proteus Enterococci Amoxicillin Cephalexin Nitrofurantoin TMP/SMX Trimethoprim Fosfomycin Primaclamycin AVOID TMP/SMX in last 6 weeks because displacement of bilirubin. NO Fluoroquinolones Avoid nitrofurantoin at term (36-42 weeks) &amp; during labor 3 day treatment, (not for betalactams or nitrocortin) with follow-up cultures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recurrence &lt; 1 month E. coli S. saprophyticus Gram(-) bacilli</td>
<td>TMP/SMX Trimethoprim Nitrofurantoin Norfloxacin * Ciprofloxacin * Cephalexin Longterm lowdose TMP/SMX will not cause resistance If macroaspiration use AM/CL or add metronidazole or clindamycin Pneumococcal vaccination recommended as per current guidelines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recurrence &gt; 3 episodes/year E. coli S. saprophyticus Gram(-) bacilli</td>
<td>TMP/SMX Trimethoprim Nitrofurantoin Norfloxacin * Ciprofloxacin * Cephalexin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PYELONEPHRITIS</td>
<td>Uncomplicated, mild E. coli K. pneumoniae Enterobacter P. mirabilis</td>
<td>TMP/SMX Levofloxacin* Ciprofloxacin * AM/CL</td>
<td>Levofloxacin* Gatifloxacin* Treatment for 14 days Use ampicillin or amoxicillin if enterococci</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROSTATITIS</td>
<td>ACUTE BACTERIAL mild to moderate E. coli S. aureus Gram(-) bacilli Enterococci Enterobacter Plus as for gonorrhea</td>
<td>TMP/SMX Trimethoprim Norfloxacin * Ciprofloxacin * Ceftriaxone</td>
<td>Treatment for 4 – 6 weeks. Reassess if no improvement after 2 weeks. Chronic infection may also be due to Pseudomonas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EPIDIDYMO- ORCHITIS &lt; 35 yoa Gonococcal C. trachomatis</td>
<td>as for gonorrhea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 35 yoa E. coli Other Gram(-) bacilli</td>
<td>TMP/SMX Ceftriaxone* Ciprofloxacin * AM/CL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GONORREA</td>
<td>Uncomplicated cervicitis, urethritis, vaginitis, anorectal infection N. gonorrhoea</td>
<td>Ceftriaxone Ciprofloxacin* Norfloxacin * Diagnosis based on laboratory investigations. All patients with N. gonorrhoea should be treated for presumptive co-existing Chlamydia (Doxycycline or Azithromycin).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NONGONOCOCAL URETHRITIS/ CERVICITIS</td>
<td>C. trachomatis</td>
<td>Azithromycin* Doxycycline Tetracycline Erythromycin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PELVIC INFLAMMATORY DISEASE</td>
<td>Ureaplasma N. gonorrhoea C. trachomatis E. coli Anaerobic A. agalactae</td>
<td>Ceftriaxone or Ciprofloxacin plus doxycycline</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>