“Optimal Antimicrobial Care
for our Patients and our Future”

Antimicrobial Treatment Guidelines for Common Infections

September 2014

Published by:
The NB Provincial Health Authorities Anti-infective Stewardship Committee under the direction of the Drugs and Therapeutics Committee
Introduction:

These clinical guidelines have been developed or endorsed by the NB Provincial Health Authorities Anti-infective Stewardship Committee and its Working Group, a sub-committee of the New Brunswick Drugs and Therapeutics Committee. Local antibiotic resistance patterns and input from local infectious disease specialists, medical microbiologists, pharmacists and other physician specialists were considered in their development.

These guidelines provide general recommendations for appropriate antibiotic use in specific infectious diseases and are not a substitute for clinical judgment.

Website Links

For Horizon Physicians and Staff:
http://skyline/patientcare/antimicrobial

For Vitalité Physicians and Staff:
http://boulevard/FR/patientcare/antimicrobial

To contact us: antimicrobial.stewardship@rha-rrs.ca

When prescribing antimicrobials:

♦ Carefully consider if an antimicrobial is truly warranted in the given clinical situation

♦ Consult local antibiograms when selecting empiric therapy

♦ Include a documented indication, appropriate dose, route and the planned duration of therapy in all antimicrobial drug orders

♦ Obtain microbiological cultures before the administration of antibiotics (when possible)

♦ Reassess therapy after 24-72 hours to determine if antibiotic therapy is still warranted or effective for the given organism or clinical situation. Reassess based on relevant clinical data, microbiologic and/or radiographic information

♦ Assess for de-escalation as appropriate based on available microbiology culture and susceptibility results
Antimicrobial Treatment Guidelines for Common Infections

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### EMPIRIC ANTIMICROBIAL THERAPY FOR DIABETIC FOOT INFECTION

(Endorsed by NB Provincial Health Authorities Anti-Infecive Stewardship Committee, February 2014)

<table>
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<tr>
<th>Infection Severity</th>
<th>Preferred Empiric Regimens</th>
<th>Alternative Regimens</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td><strong>Mild</strong></td>
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</tr>
</tbody>
</table>
| • Cellulitis less than 2 cm and without involvement of deeper tissues  
• Non-limb threatening  
• No signs of systemic toxicity | **Wound less than 4 weeks duration**  
• *cefTRIAXone 2 g IV q8h* OR  
• *sulfamethoxazole-trimethoprim 800/160 mg PO twice daily*  
• *metronIDAZOLE 500 mg PO twice daily* | **Wound less than 4 weeks duration**  
• *clindamycin 300 mg PO three times daily (only if severe β-lactam allergy)*  
• *doxycycline 100 mg PO twice daily + metronIDAZOLE 500 mg PO twice daily* |  
| **Moderate**        |                            |                      |          |
| • Cellulitis greater than 2 cm or involvement of deeper tissues  
• Non-limb threatening  
• No signs of systemic toxicity | **Wound less than 4 weeks duration**  
• *ceFAZolin 2 g IV q8h*  
• *ceTRIAXone 2 g IV once daily (to facilitate outpatient management when ambulatory administration of ceFAZolin not possible)*  
• *cefTRIAXone 2 g IV once daily + metronIDAZOLE 500 mg PO twice daily OR*  
• *metronIDAZOLE 500 mg PO twice daily (to facilitate outpatient management when ambulatory administration of ceFAZolin not possible)* | **Wound less than 4 weeks duration**  
• *levofloxacin 750mg IV/PO once daily*  
• *metronIDAZOLE 500 mg PO twice daily (only if severe β-lactam allergy)* |  
| **Severe**          |                            |                      |          |
| • Systemic signs of sepsis  
• Limb or foot threatening  
• Extensive soft tissue involvement  
• Pulseless foot | *piperacillin-tazobactam 3.375 g IV q6h* | *imipenem/cilastatin 500 mg IV q6h* OR  
• *levofloxacin 750 mg IV once daily* + *metronIDAZOLE 500 mg PO/IV twice daily (only if severe β-lactam allergy)* |  

### Clinical Pearls:

1. If high risk for MRSA, should include *sulfamethoxazole/trimethoprim* 800/160 mg PO twice daily *or doxycycline* 100 mg PO twice daily for mild infections and vancomycin weight-based dosing to a target trough of 15 to 20 mg/L for moderate-severe infections.

2. *Debridement, good glycemic control and proper wound care are important for the management of diabetic foot infections.*

3. *Cultures: prefer tissue specimens post-debridement and cleansing of wound; surface or wound drainage swabs not recommended.*


5. *Imaging: recommend plain radiography (radionuclide imaging unnecessary).*

### Duration of Therapy

- Soft tissue only: 2 weeks
- Bone involvement with complete surgical resection of all infected bone: 2 weeks
- Bone involvement with incomplete surgical debridement of infected bone: 6 weeks
- Bone involvement with no surgical debridement: 6 weeks IV, followed by 6 weeks PO

### References:


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* Dose adjustment required in renal impairment
Antimicrobial Management of *Clostridium difficile* Infection (CDI)

*NB Provincial Health Authorities Anti-Infective Stewardship Committee, May 2014*

**Diarrhea:** 3 or more unformed or watery stools in 24 hrs or less

Send stool for *Clostridium difficile* testing

Results pending but high clinical suspicion

Positive results

Colonoscopic/ histopathologic findings of pseudomembranous colitis

1. Discontinue therapy with the inciting antimicrobial agent if possible
2. Stop all anti-peristaltic & pro-motility agents unless clearly indicated
3. Begin Infection Control Precautions
   - Accommodate patient in a private room (if possible)
   - Gowns and gloves (masks unnecessary)
   - Perform hand hygiene (preferably soap and water)
4. Classify & treat according to severity of CDI

**Mild or Moderate**

- **Criteria:**
  - WBC 15x10^9/L or less OR
  - Serum creatinine level less than 1.5 x baseline level

**Initial Episode**

metroNIDAZOLE 500 mg PO three times daily x 10 - 14 days

**Any Episode**

vancomycin 125 mg PO four times daily x 10 - 14 days

**Severe**

- **Criteria:**
  - WBC greater than 15x10^9/L OR
  - Serum creatinine level 1.5 x baseline level or greater OR
  - Clinical judgement (e.g. ICU Admission)

**Severe, Complicated**

- **Criteria:**
  - Hypotension or shock OR
  - Ileus OR
  - Megacolon

**Any Episode**

vancomycin 125 mg PO/NG four times daily +/- metroNIDAZOLE 500 mg IV three times daily

(Add vancomycin 500 mg in 100mL NS retention enema four times daily if ileus)

**Duration:** Generally 10 - 14 days but may extend depending on clinical scenario.

**Recurrent *Clostridium difficile* Infection**

**First Recurrence:**

Treat same as for initial episode and according to CDI severity

**Second Recurrence:**

Vancomycin taper regimen: 125 mg PO four times daily x 14 days, then 125 mg PO twice daily x 7 days, then 125 mg PO once daily x 7 days, then 125 mg PO every 2 days x 2 weeks then discontinue

**Third Recurrence:**

Consider ID consult

**Clinical Pearls**

- Pregnancy/breast feeding: use vancomycin PO (avoid metroNIDAZOLE)
- Symptoms of CDI usually begin 2 - 3 days after colonization
- Test for cure is not recommended
- Vancomycin administered intravenously is ineffective for CDI
- Fidaxomicin is a non-formulary item that should only be considered under extenuating clinical circumstances, ID consultation required

1. Examples: loperamide, diphenoxylate, opioids, metoclopramide, domperidone, etc

2. For complicated severe episodes some authorities recommend vancomycin doses up to 500 mg; appropriate dose has not been established in clinical trials

Adapted from: Vancouver Coastal Health Antimicrobial Stewardship Treatment Guidelines for Common Infections March 2011 1st Edition
Treatment of Acute Bacterial Rhinosinusitis (ABRS)
(NB Provincial Health Authorities Anti-infective Stewardship Committee, September 2014)

**Treatment Criteria**
- Clinical diagnosis and differentiation of acute bacterial from viral rhinosinusitis is based on the characteristic patterns of clinical presentations taking into account duration of symptoms, severity of illness, temporal progression and “double-sickening” in the clinical course
- The following clinical presentations (any of the 3) are recommended for identifying patients with acute bacterial vs. viral rhinosinusitis:
  1. Onset with persistent symptoms or signs compatible with acute rhinosinusitis, lasting for greater than or equal to 10 days without any evidence of clinical improvement
  2. Onset with severe symptoms or signs of high fever (greater than or equal to 39 °C) and purulent nasal discharge or facial pain lasting for at least 3 to 4 consecutive days at the beginning of illness
  3. Onset with worsening symptoms or signs characterized by the new onset of fever, headache or increased in nasal discharge following a typical viral upper respiratory infection that lasted 5 – 6 days and were initially improving (“double sickening”)
- Initiation of empiric antimicrobial therapy is recommended as soon as the clinical diagnosis of ABRS is established based on the above criteria; if diagnosis is uncertain due to mild symptoms then consider observing without antibiotic therapy for 3 days

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Preferred Empiric Regimen</th>
<th>Alternative Empiric Regimen</th>
<th>Duration</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Mild – Moderate Symptoms less than 10 days duration</td>
<td>Symptomatic therapy only Consider intranasal saline irrigation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild – Moderate Symptoms greater than 10 days OR worsening after 5 to 6 days OR Severe Symptoms for 3 to 4 consecutive days</td>
<td>doxycycline 100 mg po twice daily</td>
<td>amoxicillin/clavulanate 875/125 mg po twice daily* β-lactam allergy sulfamethoxazole/trimethoprim 800/160 mg po twice daily*</td>
<td>5 – 7 days</td>
<td>Consider adjunctive intranasal saline irrigation If a patient has been on antibiotic therapy in the past month the antimicrobial therapy chosen should be based on a different mechanism of action regardless of the clinical success</td>
</tr>
<tr>
<td>Failure of Initial Therapy (symptoms worsening after 48 – 72 hrs. or failure to improve after 3 – 5 days of initial empiric antimicrobial therapy)</td>
<td>levofoxacin 500 mg po once daily*</td>
<td>amoxicillin/clavulanate 875/125 mg po twice daily* + amoxicillin 1000 mg po twice daily* (high-dose amoxicillin with clavulanate) OR cefuroxime 500 mg po twice daily*</td>
<td></td>
<td>Consider adjunctive intranasal saline irrigation Patients who fail to respond should be assessed for possible causes including infection with resistant organism, inadequate dosing and noninfectious cause Select an agent with broader spectrum of activity and from a different antimicrobial class</td>
</tr>
</tbody>
</table>

**Clinical Pearls**
- Compatible Signs and Symptoms: purulent nasal discharge; nasal congestion or obstruction; facial swelling, congestion or fullness; facial pain or pressure; fever; hyposmia or anosmia; or dental pain
- Majority of cases of acute sinusitis are viral and resolve within 5 to 7 days without the need for antibiotics; only 0.5 – 2% of viral upper respiratory infections are complicated by bacterial infection
- Colour of nasal discharge or sputum is related to the presence of neutrophils, not bacteria, and should not be used to diagnose bacterial rhinosinusitis
- Macrolides are not recommended for empiric therapy due to growing resistance rates for *Streptococcus pneumoniae* and *Haemophilus influenzae* within the Province
- Antibiotics have not been shown to be beneficial in chronic rhinosinusitis without acute clinical deterioration
- Consider ID consultation for refractory nosocomial rhinosinusitis
- Decongestants (topical or oral) and/or antihistamines are not recommended as adjunctive therapy

*Dose adjustment required in renal impairment*
### Treatment of Acute Exacerbation of Chronic Obstructive Pulmonary Disease
(NB Provincial Health Authorities Anti-infective Stewardship Committee, September 2014)

#### Treatment Criteria
- The use of antibiotics in acute exacerbations of chronic obstructive pulmonary disease (AECOPD) is controversial.
- Antimicrobial therapy is only recommended when AECOPD are accompanied by all 3 cardinal symptoms or at least 2 of the 3 cardinal symptoms, if increased sputum purulence is one of the 2 symptoms:
  1. Increased dyspnea
  2. Increased sputum volume
  3. Increased sputum purulence
- Patients receiving invasive or non-invasive ventilation for AECOPD should be initiated on intravenous antimicrobial therapy.
- Antibiotic selection should be based on patient symptoms and risk factors.
- If infiltrate on chest x-ray or pneumonia suspected then treat as per pneumonia treatment guidelines.

#### Risk Stratification

<table>
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<th>Alternative Empiric Regimens</th>
<th>Duration</th>
<th>Comments</th>
</tr>
</thead>
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<tr>
<td><strong>Acute Bronchitis</strong></td>
<td>Viral in most cases</td>
<td>Antimicrobial therapy not recommended</td>
<td>Symptomatic therapy only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- patients presenting with only 1 of the 3 cardinal symptoms</td>
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<tr>
<td><strong>Simple (Low-Risk Patients)</strong></td>
<td>Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis</td>
<td>doxycycline 100 mg po twice daily</td>
<td>amoxicillin/clavulanate 875/125 mg po twice daily OR sulfamethoxazole/trimethoprim 800/160 mg po twice daily OR cefuroxime 500 mg po twice daily OR clarithromycin 500 mg po twice daily</td>
<td>5 days</td>
<td>If a patient has received an antibiotic in the last 3 months the therapy chosen should be a regimen based on a different mechanism of action regardless of the clinical success.</td>
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<tr>
<td>- Less than 4 exacerbations per year</td>
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<tr>
<td><strong>Complicated (High Risk Patients)</strong></td>
<td>As in simple plus: Klebsiella spp and other Gram-negatives, increased probability of beta-lactam resistance</td>
<td>Oral Therapy: amoxicillin/clavulanate 875/125 mg po twice daily* Intravenous Therapy: cefTRIAXone 1-2 g IV once daily</td>
<td>Oral Therapy: cefuroxime 500 mg po twice daily* OR clarithromycin 500 mg po twice daily* OR levofloxacin 750 mg po once daily*</td>
<td>5 – 10 days</td>
<td>If a patient has received an antibiotic in the last 3 months the therapy chosen should be a regimen based on a different mechanism of action regardless of the clinical success.</td>
</tr>
<tr>
<td>At least one of:</td>
<td></td>
<td></td>
<td>Intravenous Therapy: levofloxacin 750 mg IV once daily* OR azithromycin 500 mg IV once daily</td>
<td>3 days (for azithromycin IV)</td>
<td>Tailor antibiotic therapy for sputum culture results if available.</td>
</tr>
<tr>
<td>- Forced expiratory volume in 1 second (FEV₁) less than 50% predicted</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Greater than or equal to 4 exacerbations per year</td>
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<tr>
<td>- Ischemic heart disease</td>
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<tr>
<td>- Use of home oxygen</td>
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<tr>
<td>- Chronic steroid use</td>
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<tr>
<td><strong>Bronchiectasis/End-stage Lung Disease</strong></td>
<td>As in simple and complicated plus: Pseudomonas aeruginosa, Staphylococcus aureus, MRSA Other non-fermenting Gram negative bacilli</td>
<td>Oral Therapy: amoxicillin/clavulanate 875/125 mg po twice daily* OR ciprofloxacin 500 -750 mg po twice daily* (if Pseudomonas aeruginosa is suspected) Intravenous Therapy: cefTRIAXone 1-2 g IV once daily OR piperacillin/tazobactam 4.5 G IV q6h* (if Pseudomonas aeruginosa is suspected)</td>
<td>Oral Therapy: levofloxacin 750 mg po once daily* Intravenous Therapy: levofloxacin 750 mg IV once daily*</td>
<td>7 – 14 days</td>
<td>Tailor antibiotic therapy for sputum culture results (past or current).</td>
</tr>
</tbody>
</table>

#### Clinical Pearls
- Macrolides are not recommended as first line empiric therapy due to growing resistance rates for *Streptococcus pneumoniae* and *Haemophilus influenzae*.
- Fluoroquinolones should be reserved for only severe cases, failure of first line options or β-lactam allergy in complicated cases due to the potential for increasing resistance, risk of *Clostridium difficile* infection and their importance in the management of other infections.
- Empiric therapy for atypical organisms (*Mycoplasma pneumoniae* & *Chlamyphilia pneumoniae*) not recommended.
- Consider obtaining cultures if not improving after 72 hours of antimicrobial therapy.
- Consider systemic corticosteroids for moderate to severe exacerbations of COPD (prednisone  40 mg po once daily for 5 days).
- Influenza vaccination and pneumococcal vaccination recommended.

* Dose adjustment required in renal impairment.
### Treatment of Adult Community Acquired Pneumonia†
(NB Provincial Health Authorities Anti-infective Stewardship Committee, June 2013)

<table>
<thead>
<tr>
<th>Severity</th>
<th>CURB65§</th>
<th>Mortality</th>
<th>Treatment site</th>
<th>Empiric Therapy** (start antibiotics within 4 hours)</th>
<th>Duration of Therapy</th>
<th>Microbiology tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0-1</td>
<td>Less than 3%</td>
<td>Home or Hospital for reason other than pneumonia</td>
<td>Amoxicillin 500 mg – 1000 mg PO three times daily OR Doxycycline 100 mg PO twice daily OR Macrolide (clarithromycin 500 mg PO twice daily OR azithromycin 500 mg PO first day followed by 250 mg once daily on days 2-5)</td>
<td>5 - 7 d</td>
<td>None routinely (unless hospitalized, see below)</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
<td>9%</td>
<td>Hospital</td>
<td>Amoxicillin 1000 mg PO three times daily* + macrolide OR Ampicillin 2 g IV q6h* + macrolide OR Doxycycline 100 mg PO twice daily</td>
<td>7 d</td>
<td>Always order: Blood cultures (2 sets) Sputum culture Urine antigen for: -pneumococcus -legionellosis‡ (Depending on clinical context, consider investigation for atypical pathogens and viruses)</td>
</tr>
<tr>
<td>High</td>
<td>3 or greater</td>
<td>15-40%</td>
<td>Hospital (consider ICU)</td>
<td>Cefuroxime 1.5 g IV q8h* + (macrolide or doxycycline) OR Ceftriaxone 2 g IV once daily + (macrolide or doxycycline) OR Levofloxacin 750 mg IV once daily* + ampicillin 2 g IV q6h* • For critically ill patient, combining a beta-lactam with either a macrolide or levofloxacin is favored • If legionellosis strongly suspected, consider using levofloxacin • Care with use of levofloxacin: association with C. difficile and nosocomial MRSA colonization</td>
<td>7 - 10 d [may extend to 14-21 days according to clinical judgment (e.g. S. aureus, Pseudomonas)]</td>
<td></td>
</tr>
</tbody>
</table>

§ CURB65 calculator: new Confusion, Urea greater than 7 mmol/L, Respiration greater than or equal to 30/min, BP less than 90 mm Hg systolic or less than or equal to 60 mm Hg diastolic, age 65 or greater. Each criterion scores 0 or 1 Interpretation of CURB65 score in conjunction with clinical judgment. Too loose an interpretation of "severe pneumonia" contributes to overprescribing second-third generation cephalosporins and respiratory fluoroquinolones

Parenteral drug | Suggested oral stepdown
--- | ---
Azithromycin | Azithromycin or Clarithromycin
Cephalosporin (any) | Amoxicillin + Clavulanic acid
Levofloxacin + Ampicillin | Levofloxacin alone ± Amoxicillin

Exclusion: patient with predisposing conditions such as cancer or immunosupression, non-pneumonic lower respiratory tract infection, macro-aspiration, or MRSA.

*If antigen is positive for Legionella, efforts must be made to obtain sputum and advise laboratory that Legionella culture is required. This is important for epidemiological purposes in case of an outbreak.

*Dose adjustment required in renal impairment

**If microbial cause of infection known, treat accordingly

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†Exclusion: patient with predisposing conditions such as cancer or immunosuppression, non-pneumonic lower respiratory tract infection, macro-aspiration, or MRSA.

‡If antigen is positive for Legionella, efforts must be made to obtain sputum and advise laboratory that Legionella culture is required. This is important for epidemiological purposes in case of an outbreak.
### Treatment of Cellulitis/Skin Infection
(NB Provincial Health Authorities Anti-infective Stewardship Committee, May 2014)

<table>
<thead>
<tr>
<th>Cellulitis/Erysipelas Severity</th>
<th>Preferred Empiric Regimens</th>
<th>Duration of Therapy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mild</strong> (no signs of systemic toxicity)</td>
<td>cephalaxin 500 mg PO four times daily[^2] β-lactam allergy: clindamycin 300 - 450 mg PO q6h</td>
<td>7-10 days</td>
<td>Work-up: None, unless there is an associated fluctuant pustule that can be drained and sent for culture</td>
</tr>
<tr>
<td>- assess for clinical evidence of MRSA (e.g. purulent boil with spreading cellulitis, previous MRSA infections or colonization)</td>
<td>MRSA Suspected: sulfamethoxazole/trimethoprim 800/160 mg to 1600/320 mg (1 or 2 DS tablets) PO twice daily[^2] OR clindamycin 100 mg PO twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Moderate</strong> (signs of systemic toxicity: documented fever/hypothermia, tachycardia [HR greater than 100 bpm] and hypotension [SBP less than 90 mm Hg or 20 mm Hg below baseline])</td>
<td>ceFAZolin 2 g IV q8h[^2] Alternative for outpatient management: (only when ambulatory administration of ceFAZolin is not possible): cefTRIAXone 2 g IV q24h β-lactam allergy: clindamycin 600-900 mg IV q8h MRSA suspected: vancomycin 15 mg/kg IV q12h[^2] (adjust based on levels to a trough target of 10-15 mg/L)</td>
<td>Step down as soon as possible to PO (See options in row above), usually total 7-10 days</td>
<td>Work-up: As above plus: Blood cultures (2 sets) CBC, Creatinine, Electrolytes</td>
</tr>
<tr>
<td>OR Progression on oral therapy[^1]</td>
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<tr>
<td><strong>Severe</strong> (sepsis syndrome, Necrotizing Fasciitis [clinical features of NF include systemic toxicity, deep severe pain – more severe than expected for skin findings, violaceous bullae, rapid spread along fascial planes, gas in soft tissues])</td>
<td>piperacillin-tazobactam 3.375 g IV q6h[^2] AND clindamycin 900 mg IV q8h</td>
<td>Consult with specialists</td>
<td>Work-up: As above plus: urgent surgical assessment for diagnostic biopsy and/or debridement</td>
</tr>
</tbody>
</table>

**Clinical pearls:**
- These guidelines are for basic skin infections only, any complicating features on history may require alternative management (Specific but not exclusive examples include: immunocompromised patients, diabetic foot infections, cellulitis associated with a surgical site, trauma or animal/human bites)
- Consider looking for predisposing feature (e.g. Tinea pedis) as source of cellulitis
- Assessment of clinical response within 48 hours should be based on pain and fever; **mild progression of erythema expected during this timeframe**[^1]
- Dose adjustment required in renal impairment
## Treatment of Adult Urinary Tract Infections
(NB Provincial Health Authorities Anti-infective Stewardship Committee, May 2014)

<table>
<thead>
<tr>
<th>Indication</th>
<th>Empiric Therapy</th>
<th>Duration of Therapy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asymptomatic Bacteriuria</strong></td>
<td><strong>Antibiotic therapy only recommended for:</strong></td>
<td></td>
<td>• Asymptomatic bacteriuria with pyuria is not an indication for antimicrobial therapy</td>
</tr>
<tr>
<td></td>
<td>- Prophylaxis for urological procedures when mucosal bleeding expected</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Treatment in pregnancy</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(Select antimicrobial therapy according to urine C&amp;S)</td>
<td></td>
<td></td>
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<tr>
<td><strong>Uncomplicated Cystitis (Lower UTI)</strong></td>
<td>(Female patients with dysuria, urgency, frequency, or suprapubic pain with no fever or flank pain)</td>
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<tr>
<td></td>
<td><strong>Preferred Regimen:</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>nitrofurantoin monohydrate/macrocrystals 100 mg po twice daily</td>
<td>5 days</td>
<td></td>
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<tr>
<td></td>
<td>cefuroxime 500 mg po twice daily</td>
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<tr>
<td></td>
<td>sulfamethoxazole/trimethoprim 800/160 mg po twice daily</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fosfomycin 3 g po once</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Alternative Regimens:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>amoxicillin/clavulanate 875/125 mg po twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cefuroxime 500 mg po twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>sulfamethoxazole/trimethoprim 800/160 mg po twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fosfomycin 3 g po once</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute Uncomplicated Pyelonephritis (Upper UTI)</strong></td>
<td>(Signs/Sx: fever, flank pain, costovertebral tenderness, abdominal/pelvic pain, nausea, vomiting with or without signs/sx of lower tract UTI)</td>
<td></td>
<td>• Outpatient management an option if female, not pregnant, no nausea/vomiting, no evidence of dehydration, sepsis or high fever</td>
</tr>
<tr>
<td></td>
<td><strong>Preferred Regimen:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cefixime 400 mg po once daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Alternative Regimens:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>amoxicillin/clavulanate 875/125 mg po twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Additional options if culture confirmed susceptibility:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>sulfamethoxazole/trimethoprim 800/160 mg po twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ciprofloxacin 500 mg po twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Systemically Unwell:</strong></td>
<td><strong>Preferred Regimen:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cefTRIAXone 1 g IV once daily</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ampicillin 2 g IV q6h + gentamicin 5 mg/kg IV once daily</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>piperacillin/tazobactam 3.375 g IV q6h</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Pregnant:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cefTRIAXone 1 g IV once daily</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ampicillin 2 g IV q6h + gentamicin 5 mg/kg IV once daily</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>piperacillin/tazobactam 3.375 g IV q6h</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td><strong>Complicated UTI</strong></td>
<td><strong>Preferred Regimen:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cefTRIAXone 1 g IV once daily</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ampicillin 2 g IV q6h + gentamicin 5 mg/kg IV once daily</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>piperacillin/tazobactam 3.375 g IV q6h</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td><strong>Pregnant:</strong></td>
<td><strong>Preferred Regimen:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cefTRIAXone 1 g IV once daily</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ampicillin 2 g IV q6h + gentamicin 5 mg/kg IV once daily</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>piperacillin/tazobactam 3.375 g IV q6h</td>
<td>14 days</td>
<td></td>
</tr>
</tbody>
</table>

**Clinical Pearls:**
- Cloudy & foul smelling urine alone is not considered an indication for a urine culture and sensitivity
- Therapy should be adjusted according to culture and sensitivity results
- Blood cultures should be drawn if febrile, septic, signs and symptoms suggestive of pyelonephritis or immunocompromised
- Post-treatment culture not recommended except in case of persistent or recurrent symptoms or pregnancy
- nitrofurantoin and fosfomycin are not appropriate for men, complicated UTI or systemic infections
1 CAUTION: Significant E.coli resistance (greater than 20%) to fluoroquinolones, sulfamethoxazole/trimethoprim and amoxicillin exist in some areas of the province; check local antibiogram and confirm urine C&S results when available
2 De-escalate according to urine/blood C&S and switch IV to PO based on conversion criteria
3 Dose adjustment required in renal impairment
Penicillin allergy

Obtain a reliable history and document exact nature!

**High risk:** history of anaphylaxis, angioedema, bronchospasm, hypotension, urticaria, Stevens-Johnson or toxic epidermal necrolysis, early onset rashes.

- Avoid penicillins, cephalosporins and other beta-lactam antibiotics.

**Low risk:** Maculopapular, non pruritic rashes, rashes greater than 72 hours after administration, nausea, diarrhoea.

- Life threatening allergy very unlikely, therefore a trial of beta-lactam under observation may be considered appropriate.
- Consideration should be given to address proof of allergy once patient has recovered.
Antimicrobial Route of Administration (IV to PO)
Therapeutic Conversion

Patients on the targeted IV antimicrobials should be assessed within 72 hours of the start of IV therapy and regularly thereafter for the appropriateness of IV to PO conversion based on the following criteria (see below for list of targeted antimicrobials and their renal dose adjustments).

GENERAL CRITERIA
The patient:
- is tolerating food, enteral feeds and/or other oral medications AND
- is not showing evidence of malabsorption (e.g. diarrhea/vomiting) AND
- does not have continuous nasogastric suctioning, gastrectomy, malabsorption syndrome, GI obstruction or ileostomy

ANTIMICROBIAL CRITERIA
The patient:
- has documented improved clinical signs and symptoms of infection AND
- is hemodynamically stable AND
- has been afebrile for at least 48 hours AND
- has normal white blood cell count or noted decrease from previously elevated level AND
- is not being treated for a condition where parenteral therapy is clinically indicated, including but not limited to: endocarditis, CNS infection, osteomyelitis, S. aureus bacteremia, undrained or complicated abscess, cystic fibrosis, febrile neutropenia AND
- doesn’t have a pathogenic isolate showing resistance to the suggested antibiotic

Table 1 – Route of Administration (IV to PO)
Conversion Protocol for Targeted Antimicrobials

<table>
<thead>
<tr>
<th>Drug</th>
<th>IV dose</th>
<th>PO drug/dose</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>azithromycin</td>
<td>250 or 500 mg q24h</td>
<td>azithromycin 250 mg</td>
<td>q24h</td>
</tr>
<tr>
<td>cefTRIAXone (For community-acquired pneumonia)</td>
<td>1000 mg q24h</td>
<td>cefTRIAXone 1 500 mg</td>
<td>q24h</td>
</tr>
<tr>
<td>ceFAZolin</td>
<td>1000 mg q8h</td>
<td>amoxicillin/clavulanate</td>
<td>q12h</td>
</tr>
<tr>
<td>ciprofloxacin</td>
<td>400 mg q12h or q24h</td>
<td>ciprofloxacin 1 500 mg</td>
<td>Same as IV</td>
</tr>
<tr>
<td>clindamycin</td>
<td>600-900 mg q6h or q12h</td>
<td>clindamycin 450 mg</td>
<td>q12h</td>
</tr>
<tr>
<td>nitroDIMAZOLE</td>
<td>500 mg q8h or q12h</td>
<td>nitroDIMAZOLE 500 mg</td>
<td>Same as IV</td>
</tr>
<tr>
<td>levofloxacin</td>
<td>500-750 mg q24h</td>
<td>levofloxacin 1 (dose same as IV)</td>
<td>Same as IV</td>
</tr>
</tbody>
</table>

* Dose adjustment required in renal impairment
* Assess for true penicillin allergy

Table 2 – Antimicrobial Dosing in Renal Impairment

<table>
<thead>
<tr>
<th>Drug</th>
<th>Usual adult dose (CrCl greater than 50 mL/min)</th>
<th>CrCl 30 - 50 mL/min</th>
<th>CrCl 10 - 30 mL/min</th>
<th>CrCl less than 10 mL/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>amoxicillin + clavulanate</td>
<td>875/125 mg q12h</td>
<td>no adjustment</td>
<td>500/125 mg q12h</td>
<td>500/125 mg q24h</td>
</tr>
<tr>
<td>cephalaxin</td>
<td>500 mg q8h</td>
<td>no adjustment</td>
<td>500 mg q12h</td>
<td>500 mg q24h</td>
</tr>
<tr>
<td>ceFAZolin</td>
<td>1000 mg q8h</td>
<td>no adjustment</td>
<td>1000 mg q12h</td>
<td>1000 mg q24h</td>
</tr>
<tr>
<td>ciprofloxacin PO</td>
<td>250 - 750 mg q12h</td>
<td>no adjustment</td>
<td>extend interval to q24h</td>
<td>extend interval to q24h</td>
</tr>
<tr>
<td>ciprofloxacin IV</td>
<td>400 mg IV q12h</td>
<td>no adjustment</td>
<td>extend interval to q24h</td>
<td>extend interval to q24h</td>
</tr>
<tr>
<td>nitroDIMAZOLE</td>
<td>500 mg q8h or q12h</td>
<td>no adjustment</td>
<td>no adjustment</td>
<td>500 mg q12h</td>
</tr>
<tr>
<td>levofloxacin</td>
<td>750 mg q24h</td>
<td>CrCl 50-100 mL/min</td>
<td>750 mg q48h</td>
<td>500 mg q48h</td>
</tr>
<tr>
<td></td>
<td>500 mg q24h</td>
<td>CrCl 20-49 mL/min</td>
<td>200 mg q24h</td>
<td>250 mg q48h</td>
</tr>
</tbody>
</table>
Topic: Nevirapine (VIRAMUNE) for Perinatal HIV Transmission Prophylaxis

A decision was made in October 2013 to list nevirapine (VIRAMUNE) 10 mg/mL oral suspension on the New Brunswick Hospital Formulary.

The oral suspension dosage form of nevirapine is only available in Canada via Health Canada’s Special Access Programme.

Nevirapine is a non-nucleoside reverse transcriptase inhibitor (NNRTI) with an established role in the prevention of vertical transmission of HIV to neonates born to mothers who received no antenatal antiretroviral therapy or with a recent or projected HIV viral load greater than 1000 copies/mL. Nevirapine is used in combination with other antiretroviral drugs for this indication.

National Institutes of Health (NIH, 2012) guidelines recommend that HIV-exposed infants of women who received no antepartum antiretroviral prophylaxis receive 3 doses of nevirapine in the first week of life (1st dose at birth, 2nd dose 48 hours after the 1st, 3rd dose 96 hours after the 2nd). Infants weighing 1.5-2 kg at birth receive 8 mg/dose by mouth, while those weighing greater than 2 kg receive 12 mg/dose by mouth.

For women who did not receive any antiretroviral therapy during pregnancy, the British Columbia (BC, 2013) guidelines recommend a single intrapartum dose of nevirapine 200 mg as soon as possible after the onset of labour or at least 2 to 3 hours prior to caesarian section. This recommendation varies from the updated NIH guidelines, which no longer includes maternal single dose nevirapine. The BC guidelines recommend the same infant dose and schedule of nevirapine as recommended by NIH.

Canadian guidelines (2003) are currently being updated.

As the likelihood of its use is deemed to be low, but the time-sensitivity for acquisition is high, a small centrally-located supply of nevirapine oral suspension is being held at the Dr. Everett Chalmers Hospital pharmacy department in Fredericton for use on request by any facility in the province.

Requests to ship nevirapine to other facilities can be made by calling the DECH pharmacy department at (506) 452-5284 (inventory) or (506) 452-5280 (dispensary) or (506) 452-5700 (switchboard after hours, ask for Administrative Officer).

Discussion with an Infectious Diseases physician is strongly encouraged.

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Prevention of Overwhelming Postsplenectomy Infection

Introduction
The spleen is the largest lymphatic organ in the body and its primary functions are to filter damaged red blood cells and micro-organisms from the blood and to aid in the production of antibodies to enhance the immune response. Asplenic patients or patients who suffer from functional asplenia have an increased risk of infection and are at risk of contracting a syndrome known as overwhelming postsplenectomy infection (OPSI). Overwhelming postsplenectomy infection has been defined as “septicaemia and/or meningitis, usually fulminant but not necessarily fatal, occurring at any time after removal of the spleen”. The incidence of OPSI has been difficult to establish due to a wide variation in occurrence rates among different groups of patients, but lifetime risk has been estimated at 5%. Risk of OPSI has been found to be dependant on age at which splenectomy occurs, time interval from splenectomy, cause for asplenia and immune status of the patient. Although the incidence of OPSI is low the estimated mortality is high (38 – 69%). Therefore, prevention and early identification of OPSI has been identified as key strategies to improve patient outcome. Some of the current strategies being used and recommended to decrease a patient’s risk of OPSI include vaccination, communication of hyposplenic state to other healthcare providers and patient education. In addition, some groups recommend either short term or lifelong prophylactic antibiotics to reduce the risk of OPSI. However, the use of antibiotics for the prevention of OPSI is not evidence based and is often limited by poor compliance and antibiotic resistance; therefore, its use should be assessed on a case-by-case basis. The Provincial Anti-infective Stewardship Committee (ASC) has prepared resources to facilitate recommended vaccination orders, vaccine distribution, patient education and communication to the primary care physician.

Vaccinations
Asplenic patients are at risk of OPSI with any micro-organism but particularly encapsulated bacteria such as *Streptococcus pneumoniae, Haemophilus influenzae* and *Neisseria meningitidis*. Encapsulated bacteria are more difficult for the body to clear because they resist antibody binding and their clearance is primarily completed by the spleen. Therefore, it is important that attention be paid to providing optimal protection against encapsulated bacteria using appropriate immunizations. The National Advisory Committee on Immunization (NACI) currently recommends the following vaccines for adult asplenic or hyposplenic patients: pneumococcal 13-valent conjugate vaccine, pneumococcal 23-valent polysaccharide vaccine, Haemophilus influenzae type b conjugate vaccine, meningococcal ACYW-135 conjugate vaccine, all routine immunizations and yearly influenza vaccine.

*Streptococcus pneumoniae* is responsible for 50 – 90% of all cases of OPSI. Pneumococcal polysaccharide vaccine (PNEUMOVAX 23) provides protection against 23 serotypes of *Streptococcus pneumoniae* and is the vaccine of choice for adult patients at high risk of invasive pneumococcal disease (IPD). The pneumococcal polysaccharide vaccine has been found to have an efficacy of 50 to 80% against IPD among the elderly and high risk groups. However, after immunization with pneumococcal 23-valent polysaccharide vaccine antibody levels begin to decline after 5 to 10 years and the duration of immunity is unknown. In an effort to improve the duration of immunity the current NACI guidelines recommend for adults with asplenia or hyposplenia, one dose of pneumococcal 13-valent conjugate vaccine (PREVNAR 13) followed at
least 2 months later by one dose of pneumococcal 23-valent polysaccharide vaccine.\textsuperscript{6} If pneumococcal 23-valent polysaccharide vaccine has been previously received then wait 1 year before giving pneumococcal 13-valent conjugate vaccine.\textsuperscript{10} In the case where only one vaccine can be given then it should be the pneumococcal 23-valent polysaccharide vaccine. A single life time booster of pneumococcal 23-valent polysaccharide vaccine is recommended 5 years after the initial dose.\textsuperscript{6} The Center for Disease Control and Prevention’s Advisory Committee on Immunization Practices released a statement in October 2012 with similar recommendations for all adult patients 19 years of age or greater.\textsuperscript{10}

A single dose of Haemophilus influenzae type b (Hib) conjugate vaccine is recommended in all patients who are functionally or anatomically asplenic and greater than 5 years of age regardless of previous Hib immunization.\textsuperscript{5,6} Current Hib vaccine should be given at least one year after any previous dose.\textsuperscript{6} This is despite limited efficacy data and a low overall risk of \textit{Haemophilus influenzae} sepsis in patients greater than 5 years of age.\textsuperscript{6}

Meningococcal ACYW-135 conjugate vaccine, MENACTRA or MENVEO, is recommended for all groups at high risk of meningococcal infection when long-term protection is required.\textsuperscript{6,7} Recommendations are to give 2 doses of meningococcal ACYW-135 conjugate vaccine at least 8 weeks apart for patients with anatomic or functional asplenia between the ages of 1 – 55.\textsuperscript{6} Based on limited evidence and expert opinion current NACI guidelines recommend that 2 doses of meningococcal ACYW-135 conjugate vaccine given 8 weeks apart is appropriate for individuals greater than 55 years of age despite lacking authorization for use in this age group.\textsuperscript{6,7} Booster doses are recommended every 3 - 5 years in individuals vaccinated at 6 years of age or younger and every 5 years for individuals vaccinated at greater than 6 years of age.\textsuperscript{6}

In addition, all routine immunizations and yearly influenza vaccination should be given as there are no contraindications to the use of any vaccine in patients with functional or anatomical hyposplenia.\textsuperscript{6} When an elective splenectomy is planned, the necessary vaccines are recommended to be given two weeks before removal of the spleen.\textsuperscript{6} In the case of an emergent splenectomy, vaccines should be given two weeks post-splenectomy or prior to hospital discharge if there is a concern that the patient may not return for vaccination.\textsuperscript{6}

Asplenic patients are at increased risk of travel related infectious diseases, including malaria and babesiosis.\textsuperscript{9} Expert advice should be sought prior to travel to endemic areas.

\textbf{Patient Education}

Education has also been cited as an essential component for successful prevention of OPSI.\textsuperscript{2} Patients should be educated regarding their increased risk of developing life threatening sepsis, what to do at the first sign of infection, to inform all healthcare professionals of their hyposplenic state and to take appropriate precautions to prevent OPSI.\textsuperscript{2} Education may be provided through thorough discussion and provision of appropriate reading materials.\textsuperscript{2}

\textbf{References:}
\begin{enumerate}
\item Moffett S. Overwhelming postsplenectomy infection: Managing Patient’s at risk. JAAPA 2009; 22(7):36-39
\end{enumerate}


**The following clinical order set is provided as a sample only and would have to be modified to an individual zone’s format for local use**

Clinical Order Set

Post-Splenectomy Vaccinations – Adult

Provincial Anti-infective Stewardship Committee

Patient: ___________________ Allergies: ___________________

INSTRUCTIONS

1. The following orders will be carried out by a nurse only on the authority of a physician/nurse practitioner.
2. A bullet preceding an order indicates the order is standard and should always be implemented.
3. A check box preceding an order indicates the order is optional and must be checked off to be implemented.
4. Applicable boxes to the right of an order must be checked off and initialed by the person implementing the order.
5. Date and time of administration must be recorded.

Contraindications

- Hypersensitivity to any vaccine component
- Anaphylactic reaction to previous dose of any of the vaccines listed below

Vaccinations (if not received pre-operatively for elective surgeries or if not received previously)

- **Haemophilus influenzae** type b conjugate vaccine (ACT-HIB) 0.5 mL intramuscularly in deltoid

- Meningococcal ACYW-135 conjugate vaccine (MENACTRA or MENVEO) 0.5 mL intramuscularly in deltoid (additional dose of meningococcal ACYW-135 conjugate vaccine required in 2 months followed by a booster every 5 years)

Pneumococcal Vaccination:

- If pneumococcal 23-valent polysaccharide vaccine (PNEUMOVAX 23) not previously received or received greater than one year ago:
  - Pneumococcal 13-valent conjugate vaccine (PREVNAR 13) 0.5 mL intramuscularly in deltoid (Pneumococcal 23-valent polysaccharide vaccine (PNEUMOVAX 23) required 8 weeks later if not previously received. Single lifetime booster of Pneumococcal 23-valent polysaccharide (PNEUMOVAX 23) required 5 years after first dose.)

  OR

- If Pneumococcal 23-valent polysaccharide vaccine (PNEUMOVAX 23) previously received but less than one year ago then wait 1 year from that date to give Pneumococcal 13-valent conjugate vaccine (PREVNAR 13). Single lifetime booster of Pneumococcal 23-valent polysaccharide (PNEUMOVAX 23) required 5 years after first dose.

- **Seasonal Influenza Vaccine** (if not already received)

Notes

- Vaccinations should be given two weeks post-operatively (if patient remains hospitalized) or on hospital discharge
- All vaccinations may be administered simultaneously. Separate syringes and separate injection sites should be used if more than one vaccine is administered on the same day.

Adapted with permission from Antimicrobial Handbook-2010 Capital Health, Nova Scotia Updated Jan 2014
### Adult Splenectomy Vaccines

**Documentation for Primary Care Provider and Public Health**

Please complete and forward to patient’s primary care provider and local public health office on discharge.

<table>
<thead>
<tr>
<th>From: ______________________________</th>
<th>Phone: ____________</th>
<th>Fax: ____________</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>To:</th>
<th>Dr. ___________________________</th>
<th>Fax #: ____________</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>To:</th>
<th>Local Public Health Office</th>
<th>Fax #: ____________</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Re. Patient Name: __________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCN: _______________________________________</td>
</tr>
<tr>
<td>D.O.B: _____________________________________</td>
</tr>
</tbody>
</table>

Asplenic patients are known to be at risk of infection, and are particularly susceptible to encapsulated organisms. Vaccinations are recommended to reduce the risk of infection in this patient population.

Your patient received the following vaccinations while in hospital after splenectomy. Please update your records, and note the patient’s need for future vaccinations.

- **Meningococcal ACYW-135 conjugate vaccine** *(MENACTRA or MENVEO)*
  - (2 doses, 2 months apart)
  - Date 1<sup>st</sup> dose given: Lot#: ____________ Dose: ____________ Administration Site: ____________
  - Date 2<sup>nd</sup> dose given: Lot#: ____________ Dose: ____________ Administration Site: ____________
  - **A booster is recommended every 5 years**

- **Haemophilus influenzae type b conjugate vaccine** *(ACT-HIB)*
  - Date given: ____________ Lot#: ____________ Dose: ____________ Administration Site: ____________

- **Pneumococcal 13-valent conjugate vaccine** *(PREVNAR 13)*
  - Date given: ____________ Lot#: ____________ Dose: ____________ Administration Site: ____________

- **Pneumococcal polysaccharide vaccine** *(PNEUMOVAX 23)* due 8 weeks after pneumococcal 13-valent conjugate vaccine *(PREVNAR 13)*
  - Date given: ____________ Lot#: ____________ Dose: ____________ Administration Site: ____________
  - **A single booster dose of pneumococcal polysaccharide vaccine is recommended after 5 years.**

- **Yearly influenza vaccine recommended.**

If you have any questions regarding these vaccinations please call the numbers above, or contact the Department of Public Health for further information.

Thank you.

This message is CONFIDENTIAL. If you received this fax by mistake, please notify us immediately.

Adapted with permission from Antimicrobial Handbook-2010 Capital Health, Nova Scotia

Updated Jan 2014
Splenectomy
Information for Patients

Role of the spleen:
• The spleen has many functions, including removal of damaged blood cells. It also plays an important role in removal of certain types of bacteria.
• The spleen may be removed (splenectomy) if it becomes overactive, stops working or is ruptured in an accident.

Life without a spleen:
• Adults can live a normal life without a spleen. However, you may be at risk of developing infections caused by certain types of bacteria which are normally removed by the spleen.
• The most serious possible infection is called overwhelming post-splenectomy infection (OPSI). This infection is rare, but can progress rapidly and may result in the loss of limbs or death.

How to reduce the risk of infection:
• Inform all doctors, dentists and other health care professionals that you do not have a spleen.
• A series of vaccinations are recommended for patients who have their spleen removed. These vaccines are two doses of meningococcal quadrivalente conjugate vaccine, pneumococcal conjugate vaccine, pneumococcal polysaccharide vaccine (due 2 months after pneumococcal conjugate vaccine), and haemophilus influenzae type b conjugate vaccine.
• You should receive a single booster of pneumococcal polysaccharide vaccine in 5 years.
• You should receive a booster dose of meningococcal conjugate vaccine every 5 years.
• You should receive a yearly flu shot.
• Your family doctor will receive a letter explaining the vaccinations you received in hospital, as well as recommendations for future vaccinations.
• Seek expert medical advice before travel. Patients without a spleen are at increased risk of travel related infectious diseases, including severe malaria. Additional vaccines and/or one or more medications may be recommended to prevent or treat travel-related infectious diseases. Where malaria is endemic, preventative measures including antimalarial medications, insect repellent and barrier precautions should be used.

Identification:
• Wallet card (included with this information) includes information on vaccinations you have received.
• Medic-Alert™ bracelet should be worn. It should indicate that you had your spleen removed.

When to seek medical attention:
• If you receive a tick or animal bites/scratches. You may be at risk of developing a serious infection
• If you notice any signs of infection, including fever, sore throat, chills, unexplained cough, vomiting or diarrhea. Contact your family doctor as soon as possible for further instructions.

Adapted with permission from Antimicrobial Handbook-2010 Capital Health, Nova Scotia
Updated Jan 2014
Wallet card for Asplenic Patients
Please complete card and give to patient on hospital discharge.

<table>
<thead>
<tr>
<th>Medical Alert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asplenic Patient</td>
</tr>
</tbody>
</table>

Patient Name: _________________________________
Physician Name: _______________________________
Physician Phone: _______________________________

Patient is at risk of potentially fatal, overwhelming infections. Medical attention required for:

- Signs of infection- fever > 38ºC, sore throat, chills, unexplained cough.
- Tick and animal bites/scratches.

<table>
<thead>
<tr>
<th>Vaccination Record</th>
</tr>
</thead>
</table>

Patient has received the following vaccinations:

- **Meningococcal ACYW-135 conjugate vaccine**
  - (MENACTRA or MENVEO)
  - 2 doses 8 weeks apart
  - Date 1st dose given: ____________
  - Date 2nd dose given: ____________

- **Meningococcal ACYW-135 conjugate vaccine booster**
  - (MENACTRA or MENVEO)
  - Dates due: every 5 years
  - Dates given:

- **Pneumococcal 13-valent conjugate vaccine** (PREVNAR 13)
  - Date given:

- **Pneumococcal polysaccharide vaccine** (PNEUMOVAX 23)
  - Date due: 8 weeks after pneumococcal 13-valent conjugate vaccine(PREVNAR 13)
  - Date given:

- **Pneumococcal polysaccharide booster** (PNEUMOVAX 23)
  - Date due: single dose 5 years after initial vaccine
  - Date given:

- **Haemophilus influenzae type b conjugate vaccine** (ACT-HIB)
  - Date given:

Adapted with permission from Antimicrobial Handbook-2010 Capital Health, Nova Scotia

Updated Jan 2014
Splenectomy Vaccine Checklist

1) Post-Splenectomy Vaccinations Clinical Order Set

2) Vaccines as per clinical order set plus package inserts

3) Splenectomy Vaccines – Documentation for Primary Care Provider and Public Health Form

4) Splenectomy – Information for Patients Sheet

5) Wallet Card for Asplenic Patients Sheet
References

Clostridium difficile Infection


Acute Bacterial Rhinosinusitis


Acute Exacerbation of Chronic Obstructive Pulmonary Disease


Leuppi JD, Schuetz P, Bingisser R et al. Short-term vs Conventional Glucocorticoid Therapy in Acute Exacerbations of Chronic Obstructive Pulmonary Disease The REDUCE Randomized Clinical Trial. JAMA 2013; 309(21):2223-2231


**Community Acquired Pneumonia**


**Cellulitis/Erysipelas**


**Urinary Tract Infections**


NOTES: