

fluoroquinilones are not to be taken by pts with myesthenia gravis

*Pharmacy 407*  
*Case Studies*  
*Upper Respiratory Tract Infections*  
*Pharyngitis and Otitis Media*  
*November, 2011*

*Learning Objectives*

1. To learn about the pathophysiology of pharyngitis.
2. To learn about the appropriate diagnosis of pharyngitis.
3. To learn about the appropriate pharmacotherapy of pharyngitis.
4. To learn about the pathophysiology of otitis media.
5. To learn about the appropriate diagnosis of otitis media.
6. To learn about the appropriate pharmacotherapy of otitis media.
7. To learn about the impact of antibiotic resistance in the treatment of respiratory tract infections.
8. To learn about various sources of information available regarding otitis media and pharyngitis.

### **Recommended Reading**

*The guidelines of the Alberta Medical Association are excellent (noted with 3 asterixes) regarding these topics and will provide a good background of the pathophysiology, clinical disease state, diagnosis, treatment and prevention. The articles Principles of Judicious use of antimicrobial agents are quite short and provide an excellent background regarding the inappropriate use of antibiotics in these disease states and the problems associated with that inappropriate use. These references have been marked with a single asterix. The Centre for Disease Control (CDC) has developed a campaign 'Get Smart: Know when antibiotics work.'; a campaign against inappropriate treatment of respiratory tract infections and antimicrobial resistance. This site, which you can access by Googling 'CDC Get Smart' offers resources for patients and healthcare professionals. The references for health care professionals can be accessed at <http://www.cdc.gov/getsmart/campaign-materials/treatment-guidelines.html>. The new guidelines from the American Heart Association on Rheumatic Fever and Pharyngitis provide good insight into the need for prevention of Rheumatic Heart Disease in varying age groups. In addition, these guidelines provide an update regarding the diagnosis and treatment of Group A Streptococcal Pharyngitis in children and adults.*

### **Acute Pharyngitis**

1. \*\*\*Guideline for The Diagnosis and Treatment of Acute Pharyngitis – the Alberta Medical Association <http://www.topalbertadoctors.org> This will take you to the Alberta Medical Association Homepage. Choose the box labeled “Publications”. Choose “Guidelines” from the drop down list in publications. Go to the TOP Website. Look for the Infectious Diseases Group of Guidelines. Click on Guidelines. Scroll down past the list of guidelines to find a directory for each type of guideline. Choose Acute Pharyngitis (there will be a guideline, a summary and a patient brochure – all are very useful). These guidelines were recently updated in 2008.
2. \*Pharyngitis – Principles of Judicious use of antimicrobial agents. Pediatrics, Vol. 101 No 1 January 1998 Supplement pg 171-173. Available from UofA e-journals.
3. Prevention of Rheumatic Fever and Diagnosis and Treatment of Acute Streptococcal Pharyngitis: A Scientific Statement From the American Heart Association Rheumatic Fever, Endocarditis and Kawasaki Disease Committee of the Council on Cardiovascular Disease in the Young, the Interdisciplinary Council on Functional Genomics and Translational Biology, and the Interdisciplinary Council on Quality of Care and Outcomes Research: Endorsed by the American Academy of Pediatrics. Michael A. Gerber et al. Circulation 2009; 119; 1541-1551. Available at <http://circ.ahajournals.org/cgi/content/full/119/11/1541> . Also available on-line from the UofA Library.
4. Treatment of group A streptococcal pharyngitis. Infectious Diseases Committee, Canadian Pediatric Society, the Canadian Journal of Infectious Diseases. Jan/Feb 1997, Vol 8 No 1 pg 17-18. (This article would only be available from the library.)

### **Acute Otitis Media**

5. \*\*\*Guideline for The Diagnosis and Treatment of Acute Otitis Media in Children – the Alberta Medical Association <http://www.topalbertadoctors.org>
6. \*Otitis Media – Principles of Judicious Use of Antimicrobial Agents. Scott F Dowell et al Pediatrics Vol 101 No 1 pg 165-170 January 1998 (Available on-line from the UofA Library)

7. \*Principles of Judicious Use of Antimicrobial Agents for Pediatric Upper Respiratory Tract Infections. Scott F Dowell et al Pediatrics Vol 10 No 1 January 1998 (Available on-line from the UofA Library)
8. American Academy of Pediatrics & American Academy of Family Physicians, Clinical Practice Guideline. Diagnosis and Management of Otitis Media. Pediatrics Vol 113 No. 5 May 2004. (Also available on the American Academy of Pediatrics Website)
9. Canadian Pediatric Society 2009 Guidelines for the Treatment of Otitis Media can be found at the Canadian Pediatric Society website by choosing position statements - [ID09-01](#) Management of acute otitis media or at <http://www.cps.ca/english/publications/InfectiousDiseases.htm>

*Pharmacy 407  
Case Studies  
Pharyngitis and Otitis Media  
November, 2011*

**Case # 1**

T. Y. is a young mother with an 8 month-old daughter, Kate. Kate's mother is concerned that the baby has had a runny nose for the past few days with a bit of a cough. Now Kate is quite irritable and appears to have developed an earache. Kate has been rubbing and tugging at her right ear. Kate has a temperature of 38.8°C. Kate has been a very healthy baby and has never received any prescription medications. Kate now weighs 17 lbs. Kate's mother is wondering if you can recommend something for fever and if an eardrop might help.

1. What advice would you give to Kate's mother?

Child is less than 2 --> go to doctor if no improvements within 24 hrs (immune syst. not yet developed)  
May give tylenol/advil for fever/pain. Popsicle or let it resolve on its own. If parent can't recognize Sx --> go to doc right away. Ear drops not effective b/c infection beyond tympanic membrane (unsure if it's ruptured either)

2. What would you advise if Kate were a healthy 3 year old weighing 30 lb. who had not previously received any prescription medications?

If less < 3 mo. old --> go to doctor right away

If 3 year old --> treat symptomatically for up to 48 to 72 hours

If in this case --> if antigen test comes back negative, do you still treat? since culture takes 48 hours to come back.

Therefore you don't treat because you may prevent rheumatic fever while waiting up to 9 days from onset of Sx --> so wait for culture to come back

After 30 years of age  
no more strep throat -  
ie. group A strep infxn

We shouldn't test & differentiate between carriers & non-carriers  
we don't have a good enough antigen test anyway

#### Case # 2

-just do antigen detection test

if positive --> treat

if not --> don't treat

usually gets better  
on its own anyway

most common b/w 5-15

J.T. is a 6 year-old boy who presents at your pharmacy with a prescription for Keflex 150 mg q8h x 10 days. Upon questioning, his mother tells you that he has been fine but developed a very sore throat and a temperature of 40°C yesterday. On questioning, you find that he has not had a cough or runny nose. She stated that the doctor had done a "quick test" in the office and found that he had "Strep Throat".

On his profile, you note that his last prescription was for Keflex 5 months ago. On questioning the mother, you find that he tolerated the Keflex well and does not have any known allergies. His mother tells you that he currently weighs 48 lb.

1. What are the usual causes of pharyngitis? What percentage of cases of pharyngitis are caused by Group A Streptococci?

Viruses most common cause. Bacterial: group A (is associated with rheumatic fever), gonorrhea (group G), Viridans (group C) --> not associated with rheumatic fever so no need to worry

Only 10-15% of strep throat is group A strep

2. What risks are associated with Group A Streptococcal pharyngitis?

Rheumatic fever, acute glomerular nephritis, peritonsillar abscesses, otitis media & pharyngitis

Laryngitis: almost always viral

3. How reliable is a positive rapid antigen-antibody test for Group A Streptococci?

If positive --> really beneficial: as it is specific for strep throat. ie. confirms it

4. How reliable is a negative rapid antigen-antibody test for Group A Streptococci?

If negative --> may be a false negative

Must have a follow-up culture

done for prevention of rheumatic fever  
and justify use of ABx

5. What problems do you find with this case and what are the consequences of these problems?

Penicillin V 40mg/Kg in two doses is the best choice (give tablet not liquid).

If must use liquid --> use amoxi (much better taste)

Keflex is not the treatment of choice

6. What recommendation(s) would you make?

7. What would you recommend (drug, dose, duration) if this patient had previously developed wheezing with the administration of penicillin?

Clindamycin 20mg/Kg (if allergic to penicillin), ibuprophen, lozenges (not antibacterial --> resistance), salt water gargle (1 tsp in 1 glass). Erythromycin/clarithromycin/azithromycin --> good alternative but don't recommend (20% already resistant) also to avoid GI side effects

8. What else might you recommend to help with the sore throat?

4.5 y.o. with classic cold (sore throat, runny nose, no fever)

### Case # 3

Four and a half year old Toby and his mother have come into your pharmacy to ask for some advice. Toby has had a sore throat, runny nose and a bit of a cough now for about 3 days. Upon questioning, his mother tells you that he has not had fever. He has no further fever. During the conversation, the mother tells you that she is concerned that Toby might have “Strep throat” and is concerned that maybe she should go to see the doctor about this.

1. What would your advice be to Toby’s mother?

No need to refer --> classic cold --> no need to do antigen test/culture.

You don't get cold Sx before strep throat either

Signs of strep throat: sore throat, swelling, tonsil goo, no cough, temp >38,

### Case #4

Summary: 7 y.o. with cold --> developed pain in ear & fever. Dr. gave amoxi 300tid x10d. No tympanic rupture. No allergies.

Jenny is 7 year-old girl who has had a cold for a few days and developed severe pain in her ears and a fever of 39.5°C. Her mother took her to a Medcenter and came to your pharmacy with a prescription for Amoxicillin 300 mg tid x 10 days. Upon questioning her mother, you find that Jenny has been a very healthy child with a few colds a year and only occasional ear infections. Her physician had mentioned that she did not have a ruptured ear drum. She has no known allergies and her last prescription was for was for Amoxicillin 1 year ago. She currently weighs 22 Kg.

1. What are the most likely organisms causing this ear infection?

Strep pneumo, H. influenzae, Moraxella catarrhalis (in order)

2. What problem(s) do you find with this case?

Does not have ruptured ear drum. Length of therapy is longer than usual.

3. What would you recommend for this patient?

5 day therapy as opposed to 10 days

4. What you recommend if Jenny’s mother had told you that Jenny was allergic to penicillin?

Maculopapular rash to penicillin/amoxicillin --> give cefuroxime (higher chance of cross allergy with amoxi because it has similar side chain to first line cephs)

If serious rxn: give macrolides --> azithromycin f5days

5. Jenny took her entire course of antibiotics and returned to her physician complaining of continued ear ache and minor fever, 38°C two days after stopping the antibiotic. Her physician examined her and found that she had continuing otitis media. What treatment would be recommended for her at this point?

40mg/kg/day is standard dosing --> already had it for 5 days but did not resolve Sx

Give amoxi/clav 90mg/kg b/c it will inc. amoxi levels (and that's what will help)

Strep pneumo changes PBP though --> clav won't help; however inc. conc of amoxi will.

15% of H. influenza produces beta-lactamase, as well moraxella catarrhalis produces beta-lactamases therefore clav. covers that.

The high dose amoxi covers Strep pneumo

9 y.o. with sore throat & ear pain & fever (with cold Sx few days before) -->

#### Case # 5

Shawn is a 9 year-old boy who comes into your pharmacy with his mother. He has had sore throat and runny nose for a few days and just this morning developed a fever of 40°C and severe ear pain. On examination, his physician had noted the ear drum was ruptured. Although Shawn has been quite healthy, he has mild asthma requiring occasional use of a Ventolin inhaler and has had several previous ear infections in the past few years – the last one was 4 months ago.

1. What treatment (drug, dose and duration) would you recommend? Shawn currently weighs 35 kg.  
Find out allergies first --> amoxicillin 40mg/kg --> if recent use of ABx or if tx failed use 90mg/kg  
Azithro or clarithro if allergic  
If ruptured ear drum --> use 10 day therapy
2. If his last ear infection was 2 months ago and had been treated with amoxicillin 500 mg tid, how would this change your recommendation?
3. If Shawn had previously developed hives following a dose of penicillin, how would this change your recommendation?