Outpatient Antibiotic Stewardship as a Tool to Curb Antibiotic Resistance

A New York State Medicaid Prescriber Education Program Enduring Presentation SELECT LINKS AND HANDOUTS FOR FURTHER USE

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ADULT ANTIBIOTIC PRESCRIBING GUIDELINES

Adult Outpatient Treatment Recommendations 2017: Summary of Guidelines¹

Acute rhinosinusitis²⁻⁴

90-98% of cases are viral

Antibiotics may NOT help even if cause is bacterial

Diagnosis

Symptoms of acute bacterial rhinosinusitis are:

- Severe (>3-4 days), fever ≥39°C (102.2°F) and purulent nasal discharge or facial pain;
- Persistent without improvement, such as nasal discharge or daytime cough for at least 10 days beyond the onset of viral upper respiratory symptoms; or
- "Double worsening", such as worsening or new onset fever, daytime cough, headache or nasal discharge within 10 days after initial improvement of a viral URI

Sinus radiographs are NOT routinely recommended.

Management

If bacterial, watchful waiting encouraged for uncomplicated infections with reliable follow-up. Evidence-based supportive care:

- · Saline nasal irrigation
- · Intranasal glucocorticoids
- Oral decongestants when there is Eustachian tube dysfunction
- · OTC analgesics and antipyretics

Macrolides (such as azithromycin) are NOT recommended due to high levels of $S.\ pneumoniae$ antibiotic resistance (~40%).

If mild/moderate and no risk factors for resistance:

 amoxicillin/clavulanate 500/125 mg PO 3x/day or 875/125 mg PO 2x/day x 5-10 days (Some experts recommend amoxicillin.)

If severe disease or risk factors for resistance (>65 yo, antibiotics within 30 days, recent hosp, ≥10% penicillin non-susceptible *S. pneumoniae*, immunocompromised):

• amoxicillin/clavulanate 2 g/125 mg PO 2x/day x 7-10 days.

Penicillin-allergic patients:

doxycycline 100 mg PO 2x/day or 200 mg PO 1x/day x5-10 days

See references for additional treatment options, including re-treatment after initial treatment failure, and other important information.

Acute uncomplicated bronchitis 5-7

Viruses cause >90% of acute bronchitis

Cough typically lasts 5 days to 3 weeks, up to 6 weeks

Diagnosis

Focus on ruling out pneumonia, which is rare among otherwise healthy adults without abnormal vital signs (heart rate >100 beats/min, respiratory rate >24 breaths/min, or oral temperature >38 °C (100.4°F)) and abnormal lung examination (focal consolidation, egophony, fremitus).

Colored sputum does NOT indicate bacterial infection.

For most cases, chest radiography is NOT indicated.

Promote appropriate antibiotic use by labeling acute bronchitis as a 'chest cold' or 'viral upper respiratory infection'.

Management

Routine treatment of uncomplicated acute bronchitis with antibiotics is NOT recommended, regardless of cough duration.

Patients may benefit from symptomatic therapy:

- · Cough suppressants
- Expectorants
- · First-generation antihistamines
- Decongestants

Consider pertussis especially with cough paroxysms, post-tussive emesis, or during known outbreaks.

See references for additional treatment options, and other important information..

Common cold or non-specific upper respiratory tract infection (URI)8,9

Most adults get 2-4 colds annually

Management

Antibiotic treatment is NOT recommended for non-specific URIs.

- · OTC analgesics can be given to relieve symptoms
- Decongestants combined with a first-generation antihistamine may provide short-term relief of nasal symptoms and cough.
- Evidence does NOT support antihistamines (as monotherapy), intranasal corticosteroids, and nasal saline irrigation as effective treatments for cold symptom relief.
- Providers and patients must weigh the benefits and harms of symptomatic therapy.



11/17

Pharyngitis7, 10, 11,

Group A Streptococcus (GAS) is the only common indication for antibiotics

Only 5-10% cases in adults are caused by GAS

Diagnosis

Clinical features alone do NOT distinguish between GAS and viral pharyngitis; a rapid antigen detection test is necessary to establish a GAS pharyngitis diagnosis.

Adults with sore throat and 2 (3 if ≥45 yo) or more of the following features should get a rapid test:

- 1. Lack of cough
- 2.Tonsillar exudates
- 3. History of fever
- 4.Swollen and tender anterior cervical lymphadenopathy

Throat cultures after negative rapid test are NOT routinely recommended for adults.

Management

GAS resistance to clindamycin and azithromycin is increasingly common.

First-line therapy for GAS:

- penicillin V 250 mg PO 4x/day or 500 mg PO 2x/day x10 days
- amoxicillin 1 g PO 1x/day or 500 mg 2x/day x10 days

Non-type I penicillin allergy:

- cephalexin 500 mg PO 2x/day x10 days
- · cefadroxil 1 g PO 1x/day x10 days
- clindamycin 300 mg PO 3x/day x10 days
- azithromycin 500 mg PO 1x/day x5 days
- clarithromycin 250 mg PO 2x/day x10 days

Immediate type I penicillin allergy:

· clindamycin, clarithromycin, or azithromycin as dosed above

See references for additional treatment options and other important information.

Acute uncomplicated cystitis 12, 13, 14

Diagnosis

Nitrites and leukocyte esterase are the most accurate indicators of acute uncomplicated cystitis

Antibiotic treatment of asymptomatic bacteriuria is NOT recommended for healthy adults EXCEPT:

- · pregnant women
- before some urological procedures

Management

First-line therapy in healthy non-pregnant, premenopausal women:

- nitrofurantoin 100 mg PO 2x/day x5 days (nitrofurantoin is NOT recommended if suspicious for early pyelonephritis)
- TMP-SMX 160/800 mg PO (one DS tablet) 2x/day x3 days (where local resistance is <20%)
- fosfomycin 3g PO x1 dose

Reserve fluoroquinolones (e.g. ciprofloxacin) for situations in which other agents are NOT appropriate.

See references for additional treatment options and other important information especially if early pyelonephritis is suspected.

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PEDIATRIC ANTIBIOTIC PRESCRIBING GUIDELINES

Pediatric Outpatient Treatment Recommendations: Summary of Guidelines¹

Acute rhinosinusitis²⁻³

90-98% of cases are viral

Antibiotics may NOT help even if cause is bacterial

Diagnosis

Symptoms of acute bacterial rhinosinusitis are:

- Severe (>3-4 days), such as a fever ≥39°C (102.2°F) and purulent nasal discharge or facial pain;
- Persistent without improvement, such as nasal discharge or daytime cough, headache for at least 10 days beyond the onset of viral upper respiratory symptoms; or
- "Double worsening", such as worsening or new onset fever, daytime cough, headache, or nasal discharge within 10 days after initial improvement of a viral URI

Halitosis, fatigue, headache, decreased appetite, but most physical exam findings are non-specific and do NOT distinguish bacterial from viral causes.

Imaging tests are no longer recommended for uncomplicated cases.

Management

If bacterial, consider watchful waiting for up to 3 days if NOT severe or worsening and with reliable follow up.

If mild/moderate and no risk factors for resistance:

 amoxicillin/clavulanate 45 mg/kg/day PO of the amoxicillin component in 2 divided doses (max 1.75 g/day) x10-14 days.
 (Some experts recommend amoxicillin.)

If severe or risk factors for resistance (age <2yo, daycare, antibiotics within 30 days, recent hosp, under immunized with PCV, ≥10% penicillin non-susceptible *S. pneumoniae*, immunocompromised):

 amoxicillin/clavulanate 90 mg/kg/day PO of the amoxicillin component in 2 divided doses (max 4g/day) x10-14 days.

Non-type I penicillin allergy:

 clindamycin 30-40 mg/kg/day PO in 3 divided doses plus (cefixime 8 mg/kg/day PO in 2 divided doses or cefpodoxime 10 mg/kg/day PO in 2 divided doses) x10-14 days.

Cannot tolerate oral medication:

• ceftriaxone 50 mg/kg IM x1 dose then oral antibiotics if improving.

Macrolides (such as azithromycin) are NOT recommended due to high levels of *S. pneumoniae* antibiotic resistance (~40%).

See references for more details, additional treatment options, including re-treatment after initial treatment failure, supportive care, and other important information.

Acute otitis media (AOM)4,5

4-10% of children with AOM treated with antibiotics experience adverse effects.

Diagnosis

Definitive diagnosis requires either:

- Moderate or severe bulging of tympanic membrane (TM) or new onset otorrhea NOT due to otitis externa.
- Mild bulging of the TM AND recent (<48h) onset of otalgia (holding, tugging, rubbing of the ear in a nonverbal child) or intense erythema of the TM.

AOM should NOT be diagnosed in children without middle ear effusion (based on pneumatic otoscopy and/or tympanometry).

Severe AOM: moderate or severe otalgia or otalgia for \geq 48 hours, or temperature \geq 39°C (102.2°F).

Management

Treat with antibiotics:

- AOM in <6 mo
- Age 6-23 mo with bilateral AOM
- Severe AOM, regardless of age

Consider watchful waiting (if reliable follow-up):

- Age 6-23 mo with unilateral AOM
- ≥2 yo with unilateral or bilateral AOM

If mild/moderate and no risk factors for resistance:

• amoxicillin 80-90 mg/kg/day PO in 2 divided doses (max 2 g/dose)

If severe or risk factors for resistance (recent beta-lactam therapy, purulent conjunctivitis, or history of recurrent AOM unresponsive to amoxicillin):

 amoxicillin/clavulanate 80-90 mg/kg/day and 6.4 mg/kg/day PO, in 2 divided doses (max 2 g/dose)

Non-type I penicillin allergy:

- · cefdinir 14 mg/kg/day IM daily or in 2 divided doses
- cefuroxime 30 mg/kg/day PO in 2 divided doses
- cefpodoxime 10 mg/kg/day PO in 2 divided dose

Duration of treatment:

<2 yo or severe symptoms: 10 days 2-5 yo, mild-moderate symptoms: 7 days ≥6 yo, mild-moderate symptoms: 5-7 days

See references for more details, additional treatment options, and other important information.

Pharyngitis^{6,7}

During winter and spring, up to 20% of **asymptomatic** children can be colonized with GAS, leading to false positives from rapid-testing and increases in unnecessary antibiotic exposure.

Streptococcal pharyngitis is primarily a disease of children 5-15 yo and is rare in preschool children.

Diagnosis

Clinical features alone do NOT distinguish between GAS and viral pharyngitis.

Children with sore throat plus 2 or more of the following features should undergo a rapid test:

- 1. Lack of cough
- 2.Tonsillar exudates
- 3. History of fever
- 4. Swollen and tender anterior cervical lymphadenopathy
- 5. Age younger than 15 yo

Testing should generally NOT be performed in children younger than 3 yo in whom GAS rarely causes pharyngitis and rheumatic fever is uncommon. In children and adolescents, negative rapid tests should be confirmed with a throat culture; positives do

Management

First-line therapy:

- amoxicillin 50 mg/kg/day PO (max 1 g/day) daily or in 2 divided doses x 10 days
- penicillin V 250 mg PO 2-3x/day (adolescents and adults: 250 mg 4x/day or 500 mg 2x/day) x 10 days

Non-type I penicillin allergy:

- cephalexin 40 mg/kg/day PO (max 1 g) in 2 divided doses x 10 days
- cefadroxil 30 mg/kg/day PO (max 1 g) daily x 10 days
- clindamycin 21 mg/kg/day PO (max 900 mg) in 3 divided doses x 10 days
- azithromycin 12 mg/kg/day PO (max 500 mg) daily x 5 days
- clarithromycin 15 mg/kg/day PO (max 500 mg) in 2 divided doses x 10 days

Immediate type I penicillin allergy:

• clindamycin, clarithromycin, or azithromycin dosed as above

See references for more details, additional treatment options, and other important information.

Common cold or non-specific upper respiratory tract infection (URI) 6,8

Colds usually last around 10 days.

NOT require a follow up culture.

Diagnosis

Usually nasal discharge begins as clear and changes throughout the course of the illness.

Fever, if present, occurs early in the illness.

Management

Antibiotics are NOT helpful and should NOT be used. Focus on symptomatic relief. OTC cough and cold medications are NOT recommended for use in children younger than 6 yo. These substances are among the top 20 substances leading to death in children <5 yo. Low-dose inhaled corticosteroids and oral prednisolone do NOT improve outcomes in non-asthmatic children.

See references for more details, additional treatment options, and other important information.

Bronchiolitis9

Diagnosis

Routine laboratory tests and radiologic studies are NOT recommended, but a chest x-ray may be warranted in atypical disease (absence of viral symptoms, severe distress, frequent recurrences, lack of improvement).

Management

Antibiotics are NOT helpful and should NOT be used.

Usually patients worsen between 3-5 days, followed by improvement.

Nasal suctioning is mainstay of therapy.

Unless hospitalized, neither albuterol nor nebulized racemic epinephrine should be administered to infants and children with bronchiolitis.

There is no role for corticosteroids, ribavirin, or chest physiotherapy in the management of bronchiolitis.

See references for more details, additional treatment options, and other important information.

Urinary tract infections (UTIs)10, 11

Diagnosis

In infants, fever and or strong-smelling urine are common. A definitive diagnosis requires both a urinalysis suggestive of infection and at least 50,000 CFUs/mL of a single uropathogen from urine obtained through catheterization or suprapubic aspiration. Diagnosis cannot be made from urine collected in a bag.

Urine testing for all children 2-24 mo with unexplained fever is no longer recommended.

Urinalysis is suggestive of infection with the presence of pyuria

(leukocyte esterase or ≥5 WBCs per high powered field), bacteriuria, or nitrites.

Nitrites are NOT a sensitive measure for UTI in children and cannot be used to rule out UTIs.

Management

Initial antibiotic treatment should be based on local antimicrobial susceptibility patterns. Suggested agents:

- TMP/SMX 6-12 mg/kg/day of TMP component PO in 2 divided doses
- amoxicillin/clavulanate 20-40 mg/kg/day PO of amoxicillin component in 3 divided doses
- cefixime 8 mg/kg/day PO daily
- cefpodoxime 10 mg/kg/day PO in 2 divided doses
- cefprozil 30 mg/kg/day PO in 2 divided doses
- cephalexin 50-100 mg/kg/day PO in 4 divided doses

Duration of treatment: 7-14 days

Antibiotic prophylaxis to prevent recurrent UTIs is NOT recommended.

See references for more details, additional treatment options, and other important information.

PEDIATRIC ANTIBIOTIC PRESCRIBING GUIDELINES



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What Is Delayed Prescribing?



WAIT. DO NOT FILL YOUR PRESCRIPTION JUST YET.

	Rest.
\supset	Drink extra water and fluids.
\supset	Use a cool mist vaporizer or saline nasal spray to relieve congestion.
\supset	For sore throats in adults and older children, try ice chips, sore throat spray, or lozenges.
$\overline{)}$	Use honey to relieve cough. Do not give honey to an infant younger than 1.

Waiting to see if you really need an antibiotic can help you take antibiotics only when needed. When antibiotics aren't needed, they won't help you, and the side effects could still hurt you. Common side effects of antibiotics can include rash, dizziness, nausea, diarrhea, and yeast infections.

Antibiotics save lives, and when a patient needs antibiotics, the benefits outweigh the risks of side effects. You can protect yourself and others by learning when antibiotics are and are not needed.

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.



What Is Watchful Waiting?



GOOD NEWS!		
Your healthcare professional believes your illness will likely go away on its own.		
You should watch and wait for days/hours before deciding whether to take an antibiotic.		
In the meantime, follow your healthcare professional's recommendations to help you feel better and continue to monitor your own symptoms over the next few days.		
○ Rest.		
Orink extra water and fluids.		
Use a cool mist vaporizer or saline nasal spray to relieve congestion.		
For sore throats in adults and older children, try ice chips, sore throat spray, or lozenges.		
Use honey to relieve cough. Do not give honey to an infant younger than 1.		
If you feel better, no further action is necessary. You don't need antibiotics.		
If you do not feel better, experience new symptoms, or have other concerns, call your healthcare professional Discuss whether you need a recheck or antibiotics.		

It may not be convenient to visit your healthcare professional multiple times, but it is critical to take antibiotics only when needed. When antibiotics aren't needed, they won't help you and the side effects could still hurt you. Common side effects of antibiotics can include rash, dizziness, nausea, diarrhea, and yeast infections.

Antibiotics save lives, and when a patient needs antibiotics, the benefits outweigh the risks of side effects. You can protect yourself and others by learning when antibiotics are and are not needed.

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.



Relief for Common Symptoms of Colds and Cough



GENERAL INSTRUCTIONS	SPECIFIC MEDICINES
 Drink extra water and fluids. 	☐ Fever or aches:
 Use a cool mist vaporizer or saline nasal spray to relieve congestion. 	☐ Ear pain:
 For sore throats, suck on ice chips, popsicles, or lozenges. (Do not give lozenges to children younger than two years old.) 	☐ Sore throat:
 Use honey to relieve cough for adults and children at least months old or older. 	□ Nasal congestion:
Other:	☐ Cough/chest congestion:
	Use medicines according to the package instructions or as directed by your doctor or pharmacist. Stop the medication when the symptoms get better.
FOR CHILDREN YOUNGER THAN 4	4 YEARS OLD
Do not use over-the-counter cough and cold runless directed by your doctor. Overuse and notentially life-threatening side effects.	medicine in children younger than 4 years old nisuse of these medicines can result in serious and
To relieve a stuffy nose, parents can use:	
 A rubber suction bulb 	
Nose saline drops	

Call your doctor if the illness has not improved in a few days or if symptoms are severe or unusual.

A clean humidifier

A cool mist vaporizer

To learn more about antibiotic prescribing and use, visit **www.cdc.gov/antibiotic-use** or call 1-800-CDC-INFO.



Watchful Waiting for Ear Infections

Rest.

Rashes

Diarrhea



Your child's ear infection may go away on its own, so your healthcare professional may suggest watching and waiting for 2–3 days to see if your child needs an antibiotic. **If so, you will not receive a prescription today**. Many ear infections will resolve on their own, and it's safer not to use antibiotics if they aren't needed.

To help your child feel better in the meantime, they should:

Drink extra water and fluids.	
 Use over-the-counter medicines as needed for relief of pain and fever: Ibuprofen. Dose and Frequency: Acetaminophen. Dose and Frequency: 	
If your child is feeling better over the next 2-3 days, no further treatment should be no	eded.
Call your healthcare professional to discuss whether your child needs a recheck or antibiotics if your child does not feel better or still has ear pain after 2-3 days.	
Call your healthcare professional right away if your child has any of the following:	
• Fever of 102.2°F (39°C) or higher.	
Fluid draining from the ear.	
Antibiotics should be used only when needed. When they aren't needed, they won't h your child, and the side effects could still cause harm. Common side effects include:	elp

Antibiotics can save lives, and when your child needs antibiotics, the benefits usually outweigh the risks of side effects and antibiotic resistance, which occurs when bacteria develop the ability to defeat the drugs designed to kill them. Your healthcare professional will help you know when antibiotics are needed.

Dizziness

Abdominal pain

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use or call 1-800-CDC-INFO.



Nausea

Diaper rashes

Watchful Waiting for Ear Infections



What is an ear infection?

There are different types of ear infections. **Middle ear infection** (acute otitis media) is an infection in the middle ear, or behind the eardrum.

What does the term "watchful waiting" mean?

It means observing your child for 2-3 days to give your child's immune system time to fight off the infection rather than starting antibiotics immediately. Your healthcare professional will wait to see if your child gets better before giving your child a prescription for antibiotics.

Why would my healthcare professional recommend watchful waiting instead of giving antibiotics immediately?

Studies have shown that most children with mild ear infections get better without antibiotics. The child's immune system is often able to fight off the infection on its own. Antibiotics can sometimes improve symptoms more quickly, but antibiotics can also cause problems, such as side effects and antibiotic resistance. **Two out of 3 children with mild ear infections get better without receiving any antibiotics**.

Which children qualify for watchful waiting?

Children between ages 6 months and 23 months if only one ear is infected, and who have:

OR

Children ages 2 years and older if one or both ears are infected, and who have:

- Symptoms of ear infection that have lasted less than 2 days.
- Mild ear pain
- Temperature lower than 102.2°F (39°C)

How can I improve my child's symptoms if I don't give antibiotics?

The symptoms of an ear infection—like ear pain and fever—can be helped with ibuprofen or acetaminophen, rest, and extra fluids.

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use or call 1-800-CDC-INFO.



Your health is important to me.



That's why I'm signing the "Smart Use Guarantee."

Antibiotics don't work for viral infections like the common cold, most coughs, and most sore throats. Taking antibiotics when they don't work can do more harm than good by causing stomach upset, diarrhea, or allergic reactions.

I guarantee I will do my best to prescribe antibiotics only when you need them.

Antibiotics can be life-saving, but bacteria are becoming more resistant. If we're not careful about how we prescribe and use the antibiotics we've relied on for years, they might not work for us in the future.

To learn more visit: cdc.gov.

Signature(s)



Symptom Relief for Viral Illnesses

Name:
Date:
Diagnosis:
 Cold or Flu Middle ear fluid (Otitis Media with Effusion, OME) Cough Viral Sore Throat
Other:
You have been diagnosed with an illness caused by a virus. Antibiotics do not cure viral infections. If given when not needed, antibiotics can be harmful. The treatments prescribed below will help you feel better while your body's own defenses are fighting the virus.
General instructions:
 Drink extra water and fluids. Use cool mist vaporizer or saline nasal spray to relieve congestion. For sore throats in older children and adults, use ice chips, sore throat spray or lozenges. Use honey to relieve cough. Do not give honey to an infant less than 1 year of age.
Specific medicines:
Fever or aches:
O Ear pain:
O Sore throat and Congestion:
Use medicines according to the package instructions or as directed by your healthcare professional. Stop the medication when the symptoms get better.
Follow up:
 If not improved in days/hours, if new symptoms occur, or if you have other concerns, please call or return to the office for a recheck. Phone:
Other:
Signed:



For more information, visit: health.ny.gov/professionals/protocols_ and_guidelines/antibiotic_resistance/