Prescribing Guidelines for Acute Respiratory Tract Infections

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Prescribing Antimicrobials for Common Illnesses

When treating common respiratory illnesses such as ear infections and strep throat, it is important to know how best to use prescription antimicrobial drugs. The continued misuse and overuse of common antimicrobials is contributing to antimicrobial resistance and other health care challenges. This tool is designed to help guide you in the prescribing of antimicrobial drugs for common respiratory infections in otherwise healthy children.

Choosing Augmentin™ Formulations

Augmentin™ suspension formulations are not interchangeable because each formulation has differing ratios of clavulanate. It is important to remember that too much clavulanate results in significant diarrhea and not enough will result in treatment failure. Selecting the appropriate dosage based on the patient's age, weight and indication is critical to ensuring optimal efficacy and tolerability.

Dosing recommendations are provided. Doses are based on the amoxicillin component. The target dose of clavulanic acid is 6.4 mg/kg/day. Doses less than 6.4 mg/kg/day will result in treatment failure. Doses above 10 mg/kg/day will result in significant diarrhea. Occasionally, prescribing practices may deviate from the chart. Please consult a pharmacist for additional assistance.

Amoxicillin-Clavulanate (Augmentin™) Formulations
Daily doses are expressed as amoxicillin

Infection	Age	Ratio*	Patient weight < 40 kg	Patient weight ≥ 40 kg
Uncomplicated sinusitis	< 3 months of age	4:1	Amoxicillin/clavulanate 125 mg – 31.25 mg / 5 mL **10 mg/kg/dose orally three times daily**	N/A
	≥ 3 months of age	7:1	Amoxicillin/clavulanate 400 mg – 57 mg / 5 mL **12.5–22.5 mg/kg/dose orally twice daily**	*Tablet:* Amoxicillin/clavulanate 875 mg – 125 mg *Susp:* Amoxicillin/clavulanate 400 mg – 57 mg / 5 mL **500–875 mg/dose orally twice daily**
Otitis media, pneumonia or severe sinusitis	< 3 months of age ¥	7:1	Amoxicillin/clavulanate 400 mg – 57 mg / 5 mL **30 mg/kg/dose orally twice daily**	N/A
	≥ 3 months of age	14:1	Amoxicillin/clavulanate ES 600 mg – 42.9 mg / 5 mL **40–45 mg/kg/dose orally twice daily**	*ER Tablet:* Amoxicllin/clavulanate 875 mg – 62.5 mg *Susp:* Amoxicillin/clavulanate 600 mg (ES) – 42.9 mg / 5 mL **2000 mg/dose orally twice daily**

*Represents ratio of amoxicillin to clavulanate in specific Augmentin™ formulations within adjacent column.
¥ This dosing regimen is the expert opinion of Nationwide Children's Hospital Infectious Disease clinicians.

Group A Streptococcal (GAS) Pharyngitis

Group A streptococcal pharyngitis, also known as strep throat, is characterized by sore throat, fever, tonsillar exudates and swollen lymph nodes in the neck. Pharyngitis may also be viral in cause, and it is important to distinguish between viral pharyngitis and GAS pharyngitis before beginning treatment.

Diagnosis requires confirmation by rapid testing or culture. Due to resistance patterns, if clindamycin or azithromycin is used because of allergies to first-line therapies, it is recommended to complete a throat culture in order to confirm susceptibility. It is important to remember the following key points in diagnosing GAS pharyngitis.

- Do not test if there is a viral presentation of upper respiratory tract infection signs and symptoms, including cough, nasal congestion, conjunctivitis, hoarseness, diarrhea or oropharyngeal lesions
- Do not treat empirically

GAS Treatment Options	
Amoxicillin	50 mg/kg/dose orally once daily for 10 days (max 1000 mg/dose)*
Penicillin VK	< 27 kg: 250 mg/dose orally twice daily for 10 days ≥ 27 kg: 500 mg/dose orally twice daily for 10 days
Penicillin G Benzathine (Bicillin L-A™)	< 27 kg: 600,000 units intramuscular as a single dose ≥ 27 kg: 1.2 million units intramuscular as a single dose
Penicillin Allergic (nonanaphylactic)	
Cephalexin (Keflex™)	20 mg/kg/dose orally twice daily for 10 days (max 500 mg/dose)
Penicillin Allergic (anaphylactic)	
Clindamycin (Cleocin™)	7 mg/kg/dose orally three times a day for 10 days (max 300 mg/dose)
Azithromycin (Zithromax™)	12 mg/kg/dose orally on day 1 (max 500 mg/dose), followed by 6 mg/kg/dose orally on days 2–5 (max 250 mg/dose)

*Amoxicillin 400 mg/5 mL: 1200 mg is an appropriate max dose in order to simplify dose (15 mL per dose).

Acute Otitis Media (AOM)

Acute otitis media (AOM) is inflammation of the middle ear with fluid in the middle ear. Signs and symptoms may include ear pain, a perforated eardrum and drainage. A diagnosis of AOM is appropriate in children who present with at least one of the following:

- Moderate to severe bulging of the tympanic membrane
- New onset of otorrhea not due to acute otitis externa

AOM Treatment Options	
Amoxicillin	< 3 months*: 30 mg/kg/dose orally twice daily > 3 months: 40–45 mg/kg/dose orally twice daily (max 2000 mg/dose)
Amoxicillin/clavulanate ES (Augmentin™ ES)	40–45 mg/kg/dose of amoxicillin orally twice daily (max 2000 mg/dose) For patients < 3 months refer to augmentin dosing chart above.
Amoxicillin/clavulanate XR (Augmentin™ XR)	> 40 kg: 2000 mg amoxicillin orally twice daily (max 2000 mg/dose) for children and adolescents who prefer tablets over a suspension
Penicillin Allergic	
Cefdinir (Omnicef™)	> 6 months: 14 mg/kg/dose (max 600mg/dose) orally once daily
Ceftriaxone (Rocephin™)	50 mg/kg (max 1 g/dose) intramuscular injection per day for 1 to 3 days

* This dosing regimen is the expert opinion of Nationwide Children's Hospital Infectious Disease clinicians.

Amoxicllin/clavulanate is preferred for patients who have taken antibiotics in the last 30 days, have a history of otitis media unresponsive to amoxicillin and have concurrent conjunctivitis. Concurrent conjunctivitis suggests *Haemophilis influenzae*, in which case amoxicllin/clavulanate will treat conjunctivitis and eye drops are not needed.

The duration of oral therapy for these treatment options is dependent upon the age of the patient and the severity of their symptoms:

- < 2 years or severe symptoms, treat for 10 days
- 2–5 years and mild to moderate symptoms, treat for 7 days
- ≥ 6 years and mild to moderate symptoms, treat for 5 days

Sinusitis

Another common illness in otherwise healthy individuals is sinusitis. The diagnosis of sinusitis should be based on one of three clinical scenarios:

- Persistent illness with any nasal drainage or daytime cough for greater than 10 days without improvement
- Worsening or new onset nasal drainage, daytime cough or fever after initial improvement ("double sickening")
- Severe onset with ≥ 102°F temperature and purulent nasal discharge for at least three consecutive days

Sinusitis Treatment Options	
Uncomplicated Sinusitis	
Amoxicillin/clavulanate 400 mg – 57 mg / 5 mL suspension or chewable tablet (Augmentin™) OR **Amoxicillin/clavulanate 875 mg – 125 mg tablet**	22.5 mg/kg/dose orally twice daily for 5-7 days (max 875 mg/dose)
Severe Sinusitis*	
Amoxicillin/clavulanate 600 mg – 42.9 mg / 5 mL suspension (Augmentin™ ES) OR **Amoxicillin/clavulanate 1000 mg – 62.5 mg tablet (Augmentin™ XR)**	45 mg/kg/dose orally twice daily for 5-7 days (max 2000 mg/dose)
Penicillin Allergic	
Levofloxacin (Levaquin™)	6 months - 5 years: 8–10 mg/kg/dose orally **twice** daily for 5-7 days (max 500 mg/day) ≥ 5 years: 8–10 mg/kg/dose orally **once** daily for 5-7 days (max 500 mg/day)

*Reserve for severe infection (e.g., evidence of systemic toxicity with fever of 39°C [102°F] or higher), attendance at daycare, age < 2, hospitalization in past five days, antibiotic use within the past month or immunocompromised.

Community-Acquired Pneumonia (CAP)

Community-acquired pneumonia (CAP) infections can be either viral or bacterial in cause. Respiratory viruses that cause lower respiratory tract inflammation are much more common in those between 3 months and 5 years of age. *Streptococcus pneumoniae* is the predominant bacterial cause of CAP in children.

CAP Treatment Options	
Amoxicillin	< 3 months*: 30 mg/kg/dose orally twice daily for 5 days > 3 months: 45 mg/kg/dose orally twice daily for 5 days (max 2000 mg/dose)
Penicillin Allergic	
Clindamycin (Cleocin™)	10mg/kg/dose orally three times daily for 5 days (max 600 mg/dose)
Penicillin Allergic AND Failed Clindamycin	
Levofloxacin (Levaquin™)	6 months–5 years: 8–10 mg/kg/dose orally twice daily for 5 days (max 750 mg/day) ≥ 5 years: 8–10 mg/kg/dose orally once daily for 5 days (max 750 mg/day)

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For school-aged children, if an atypical respiratory pathogen such as *Mycoplasma pneumoniae* is suspected, adding azithromycin to treatment with amoxicillin may be reasonable (consider running a mycoplasma PCR, which can be ordered through ChildLab).

Azithromycin dosing: 10 mg/kg/dose orally once daily on day 1 (max 500 mg/dose), followed by 5mg/kg/dose orally once daily on days 2-5 (max 250 mg/dose).

For additional consults or assistance, please contact
PFKPharmacy@NationwideChildrens.org

Referrals and Consultations

Online: **NationwideChildrens.org**
Phone: **(614) 722-6600** or **(877) 722-6220** | Fax: **(614) 722-4000**
Physician Direct Connect Line for 24-hour urgent physician consultations:
(614) 355-0221 or **(877) 355-0221**

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