

Children's Mercy Kansas City Outpatient Antibiotic Handbook

Lisa Hiskey DO, Joel Waddell DO, Alaina Burns PharmD,
BCPPS, and Rana El Feghaly MD, MSCI

CMH ASP Group

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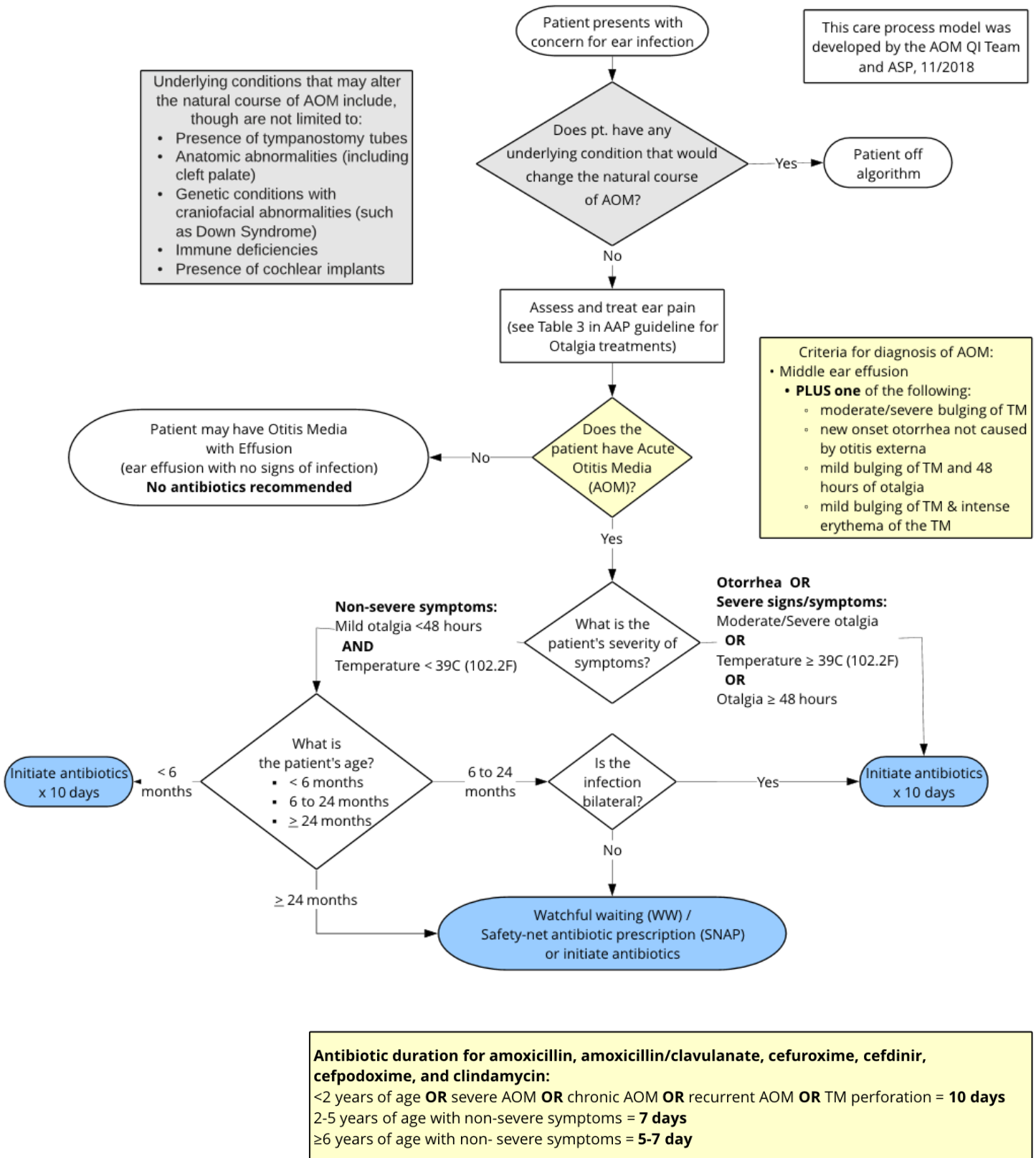
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Online version available via the Children’s Mercy Evidence Based Practice website (<https://www.childrensmercy.org/health-care-providers/evidence-based-practice/clinical-practice-guidelines/>) under the “Acute Otitis Media” Care Process Model

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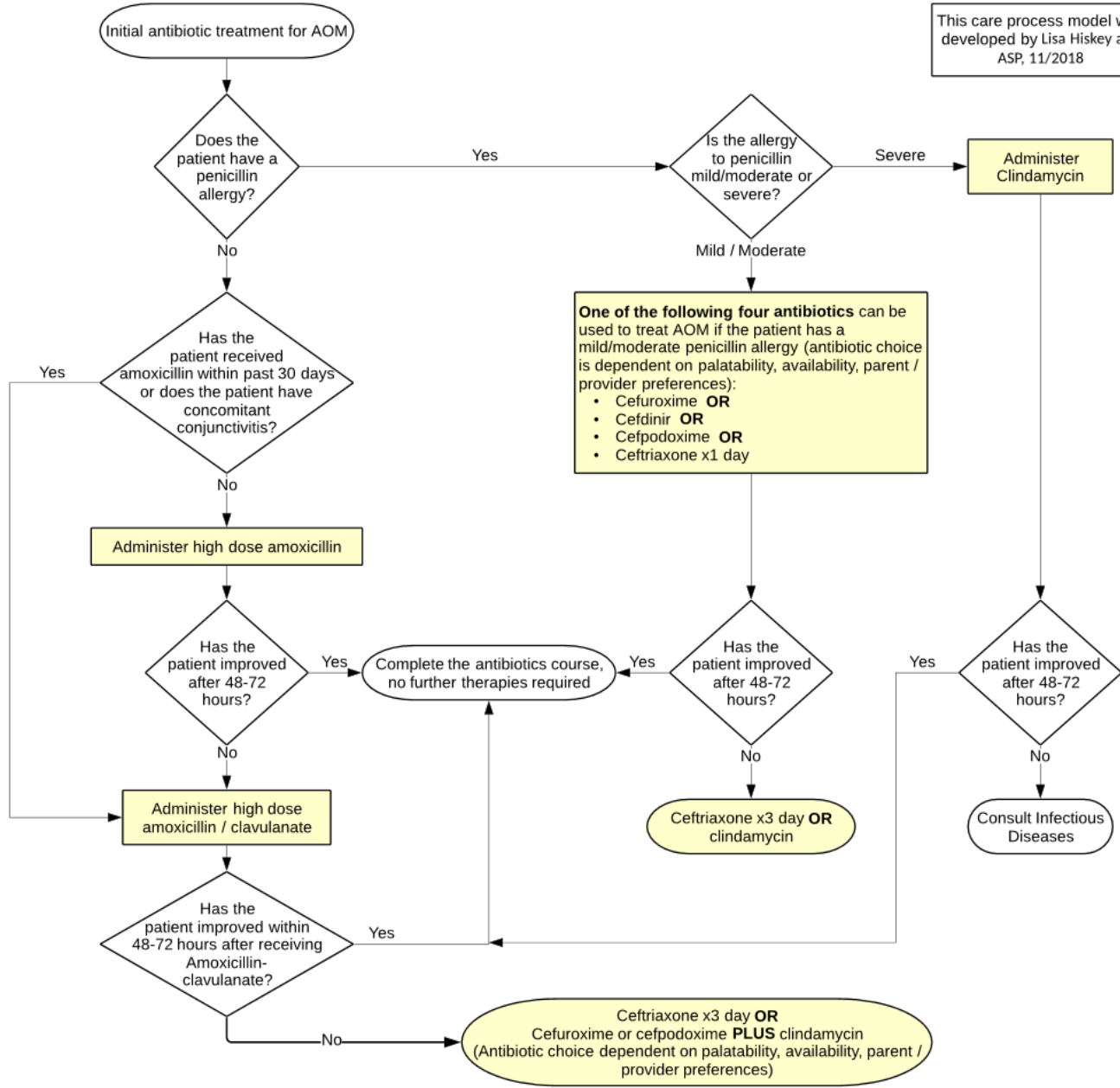
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Acute Otitis Media (AAP guideline 2013)¹



Acute Otitis Media (AAP guideline 2013)¹

This care process model was developed by Lisa Hiskey and ASP, 11/2018



Dosing of antibiotics found in algorithm:

- Amoxicillin 40-50 mg/kg/dose PO BID (max 2000 mg/dose)
- Amoxicillin/clavulanate 40-50 mg/kg/dose (amoxicillin component) PO BID (max 2000 mg amoxicillin component /dose)
- Cefuroxime 250 mg PO BID (max 500 mg/dose) for children able to swallow pills (only available in tablet form)
- Cefdinir 7 mg/kg/dose PO BID (max 300 mg/dose)
- Cefpodoxime 5 mg/kg/dose PO BID (max 200 mg/dose)
- Ceftriaxone 50 mg/kg/dose IM/IV qDay x 1-3 days* (daily max 1 gram/dose)

*Administer Ceftriaxone for 1 day when used as a first line for patients with penicillin allergy, and 3 days if the patient has failed other antibiotics

- Clindamycin 10 mg/kg/dose PO TID (max 600 mg/dose)

Antibiotic duration for amoxicillin, amoxicillin/clavulanate, cefuroxime, cefdinir, cefpodoxime, and clindamycin:

<2 years of age OR severe AOM OR chronic AOM OR recurrent AOM OR TM perforation = **10 days**

2-5 years of age with non-severe symptoms = **7 days**

≥6 years of age with non- severe symptoms = **5-7 day**

Acute Otitis Media (AAP guideline 2013)¹

Watchful waiting (WW)/ Safety-Net Antibiotic Prescription (SNAP):

- Joint decision between provider and caregiver
- Must have close follow-up (within 48-72 hours) if SNAP not given
- Must be able to fill antibiotic prescription if signs/symptoms worsen or fail to improve in 48-72 hours from onset of symptoms

NOTE: If using WW/SNAP, please place a comment in prescription instructions to “fill only upon patient/family request”

Antibiotic Recommendations

- First line:
 - Amoxicillin 40-50 mg/kg/dose PO BID (max 2000 mg/dose)
- Alternative therapies:
 - If received amoxicillin within the past 30 days **OR** concomitant conjunctivitis:
 - Amoxicillin/clavulanate 40-50 mg/kg/dose (amoxicillin component) PO BID (max 2000 mg amoxicillin/dose)
 - For liquid, use Augmentin ES-600™ 600mg/42.9mg/5mL
 - For pills, use 875 mg tablets or 1000 mg XR tablets
 - Mild/moderate penicillin allergy (e.g. rashes including hives):
 - Cefuroxime 250 mg PO BID for children able to swallow pills (only available in tablet form)
 - Cefdinir 7 mg/kg/dose PO BID (max 300 mg/dose)
 - Cefpodoxime 5 mg/kg/dose PO BID (max 200 mg/dose)
 - Ceftriaxone 50 mg/kg/dose IM/IV qDay x 1-3 days (max 1000 mg/dose)

NOTE: Risk of penicillin/cephalosporin cross-reactivity extremely low

NOTE: Some cephalosporins may have limited availability and/or may be cost-prohibitive
 - Severe penicillin allergy (e.g. anaphylaxis):
 - Clindamycin 10 mg/kg/dose PO TID (max 600 mg/dose)
 - Failure to improve after 48-72 hours of initial antibiotic:
 - Treatment failure with amoxicillin
 - Amoxicillin/clavulanate 40-50 mg/kg/dose (amoxicillin component) PO BID (max 2000 mg amoxicillin/dose)
 - For liquid, use Augmentin ES-600™ 600mg/42.9mg/5mL
 - For pills, use 875 mg tablets OR XR 1000 mg tablets
 - Treatment failure with amoxicillin/clavulanate:
 - Ceftriaxone 50 mg/kg/dose (max 1000 mg/dose) IM or IV daily x 3 days

OR

 - Cefuroxime or cefpodoxime PLUS clindamycin

Otorrhea

- AOM with a perforated tympanic membrane (the following could be considered in addition to systemic antibiotic) **OR** AOM with presence of patent tympanostomy tubes:
 - Ciprodex[®] (Ciprofloxacin 0.3% - Dexamethasone 0.1%) otic suspension, 4 drops instilled into affected ear twice daily for 7 days for patients >6 months of age
 - If Ciprodex[®] on shortage or cost-prohibitive, may use ciprofloxacin ophthalmic 2 drops +/- dexamethasone ophthalmic 2 drops twice daily for 7 days in patients >6 months of age
 - Ofloxacin otic solution, 5 drops into affected ear twice daily for 10 days for children > 6 months of age
 - Otitis externa with intact tympanic membrane
 - May use Ciprodex[®], ciprofloxacin ophthalmic/dexamethasone ophthalmic or Ofloxacin as noted above
- OR**
- Cortisporin[®] otic (neomycin-polymyxin B-hydrocortisone otic), 3 drops to affected ear 3 times per day for 7 days

Group A Streptococcal pharyngitis (IDSA guidelines 2012)²

Please refer to CPG for testing algorithm:

<https://www.childrensmercy.org/health-care-providers/evidence-based-practice/clinical-practice-guidelines/pharyngitis-algorithm/>

NOTE: GAS pharyngitis is uncommon in children <3 years of age and children of any age with viral symptoms

- First Line:
 - Amoxicillin 50 mg/kg/dose PO qDay (max 1000 mg/day) x 10 days
 - Penicillin G benzathine IM x 1
 - < 27 kg: 600,000 U
 - ≥ 27 kg: 1.2 million U
 - Penicillin VK
 - < 27kg: 250 mg PO BID – TID x 10 days
 - ≥ 27 kg: 500 mg PO BID – TID x 10 days
- Alternative therapies:
 - Mild penicillin allergy (e.g. rashes including hives):
 - Cephalexin 20-25 mg/kg/dose PO BID (max 500 mg/dose) x 10 days
 - Severe penicillin allergy (e.g., anaphylaxis):
 - Clindamycin 7 mg/kg/dose PO TID (max 300 mg/dose) x 10 days
 - Azithromycin 12 mg/kg/dose PO qDay (max 500 mg/dose) x 5 days

NOTE: Azithromycin is **not recommended** unless patient has severe allergy to penicillin and cephalosporins. Resistance is well known, and treatment failure may occur

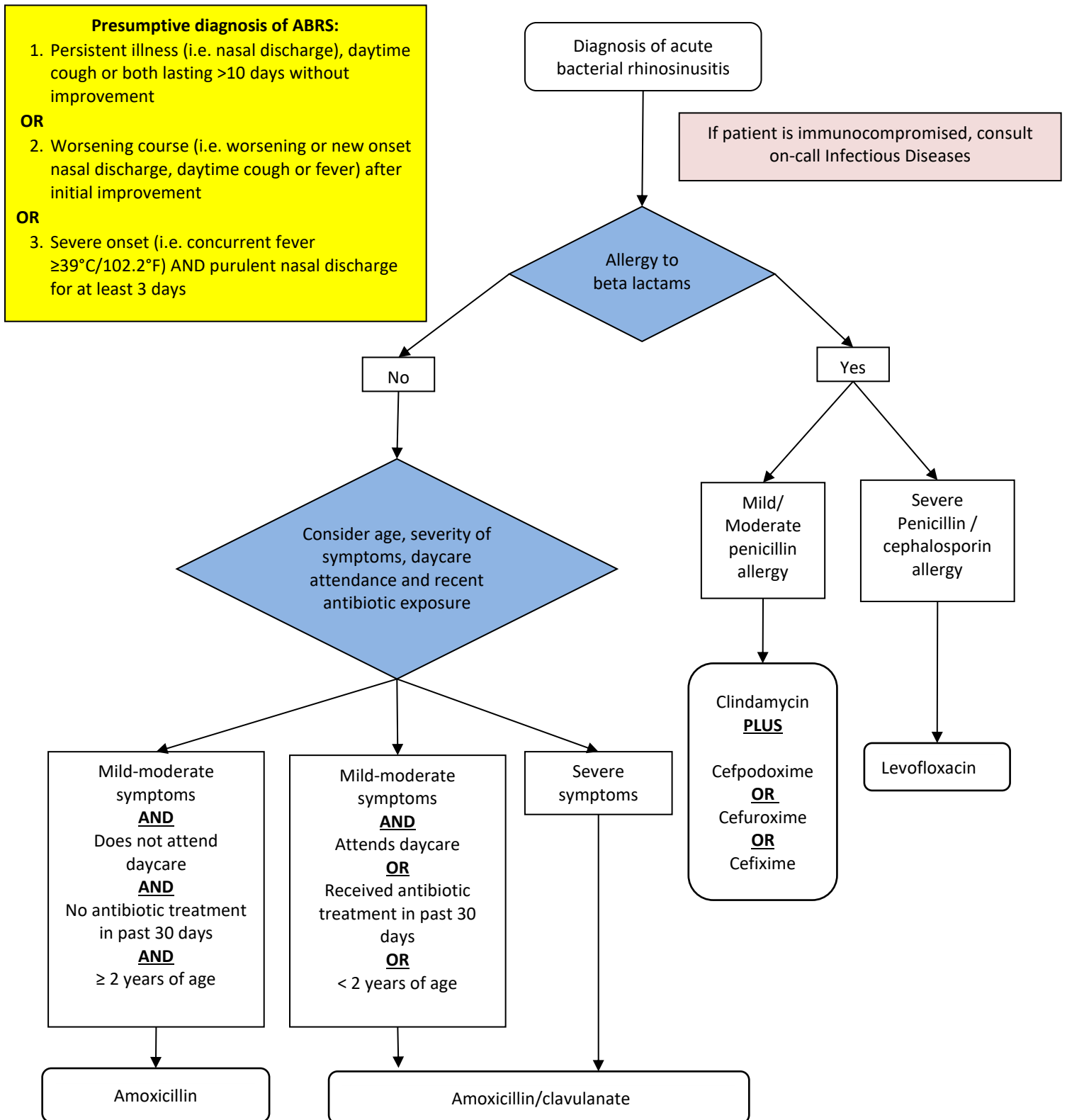
Uncomplicated community-acquired pneumonia (IDSA guidelines 2011)³

Please refer to CPG:

<https://www.childrensmercy.org/health-care-providers/evidence-based-practice/clinical-practice-guidelines/community-acquired-pneumonia-algorithm/>

- Duration: 5-7 days
- First line:
 - Amoxicillin 40-50 mg/kg/dose PO BID (max 2000 mg/dose)
- Alternative therapies:
 - Mild/moderate penicillin allergy (e.g. rashes including hives):
 - Cefuroxime 250 mg PO BID for children able to swallow pills (only available in tablets)
 - Cefpodoxime 5 mg/kg/dose PO BID (max 200 mg/dose)
 - Cefprozil 15 mg/kg/dose PO BID (max 500 mg/dose)
NOTE: Cefdinir is NOT recommended for empiric treatment of CAP as it is less effective against *Streptococcus pneumoniae*
NOTE: Some cephalosporins may have limited availability and/or may be cost-prohibitive. If the above noted antibiotics are not available, clindamycin is preferred over cefdinir.
 - Clindamycin 10 mg/kg/dose PO TID (max 600 mg/dose)
- Severe penicillin allergy (e.g anaphylaxis)/ cephalosporin allergy:
 - Clindamycin 10 mg/kg/dose PO TID (max 600 mg/dose)
- Severe penicillin allergy / cephalosporin allergy AND intolerance of clindamycin:
 - Levofloxacin 8-10 mg/kg/dose PO BID (ages 6 months – 5 years)
OR qDay (≥ 5 years) (max 750 mg/**day**)
- Atypical pneumonia (consider in adolescents with bilateral disease):
 - Azithromycin 10 mg/kg/dose PO qDay on day #1 (max 500 mg/dose), then 5 mg/kg/dose PO qDay on days #2-5 (max 250 mg/dose)
NOTE: resistance to azithromycin is significant among typical bacterial pathogens, especially *Streptococcus pneumoniae*

Acute bacterial rhinosinusitis (ABRS) (AAP guidelines 2013)⁴



Acute bacterial rhinosinusitis (ABRS) (AAP guidelines 2013)⁴

- Diagnosis

NOTE: ABRS is uncommon in children < 2 years of age

- Presumptive diagnosis of ABRS can be made if patient with acute URI presents with:

- Persistent illness (i.e. nasal discharge), daytime cough, or both lasting >10 days without improvement

OR

- Worsening course after initial improvement (i.e. worsening or new onset nasal discharge, daytime cough or fever)

OR

- Severe onset (i.e. concurrent fever $\geq 39^{\circ}\text{C}/102.2^{\circ}\text{F}$) AND purulent nasal discharge for at least 3 consecutive days

-

- Treatment

- Duration: 10 days

- Treatment should continue for at least 7 days after resolution of symptoms

- First line:

- Mild-moderate disease AND patient ≥ 2 years of age, AND does not attend daycare, AND has not received antibiotics within the past 30 days

- Amoxicillin - Standard dose: 22.5-25 mg/kg PO BID (max 875 mg/dose)

- **Recommended at CM due to *Streptococcus pneumoniae* resistance <10%**

- Amoxicillin - High-dose: 45-50 mg/kg PO BID (max 2000 mg/dose)

- Recommended in communities with high prevalence of penicillin non-susceptible *Streptococcus pneumoniae*

- Severe disease **OR** mild-moderate disease WITH any of the following: <2 years of age, attends daycare, received antibiotics within the past 30 days

- Amoxicillin-clavulanate - High dose: 40-50 mg/kg/dose (amoxicillin component) PO BID (max 2000 mg/dose)

- For liquid, use Augmentin ES-600TM 600mg/42.9mg/5mL

- For pills, use 875 mg or 1000 mg XR tablets

(see next page for alternative therapies)

- Alternative therapies for acute bacterial rhinosinusitis:
 - Mild/moderate penicillin allergy (e.g. rashes including hives):
 - Clindamycin 10 mg/kg/dose PO TID (max 600 mg/dose)
PLUS one of the following cephalosporins:
 - Cefpodoxime 5 mg/kg/dose PO BID (max 200 mg/dose)
 - Cefuroxime 250 mg PO BID for children able to swallow pills (only available in tablets)
 - Cefixime 4 mg/kg/dose PO BID (max 200 mg/dose)
NOTE: Risk of penicillin/cephalosporin cross-reactivity extremely low
NOTE: Some cephalosporins may have limited availability and/or variable insurance coverage
 - Severe penicillin allergy (e.g anaphylaxis) or cephalosporin allergy:
 - Levofloxacin 10 mg/kg/dose PO BID (6 months- 5 years) **OR** qDay (\geq 5 years) (max 500 mg/**day**)
 - Consider consulting Infectious Diseases physician

NOTE: per AAP guideline, even patients with a history of serious type 1 immediate reaction to penicillin may be safely treated with cefuroxime and cefpodoxime given low risk of cross-reactivity

Cystitis (uncomplicated urinary tract infection) in children >2 months of age

If history of UTIs, empiric therapy should be based on previous microbiology, if available

- Duration:
 - Adolescents (≥ 13 years old): 3 days
 - Younger children: 5-7 days
- First line:
 - Cephalexin 16.6 mg/kg/dose PO TID (max 1500 mg/**day**)
- Alternative therapies:
 - Cefixime 8 mg/kg/dose PO qDay (max 400 mg/**day**)
 - Amoxicillin/clavulanate 13.3 mg/kg/dose PO TID (max 500 mg amoxicillin/dose)
- Severe penicillin allergy (e.g. anaphylaxis) / cephalosporin allergy:
 - TMP/SMX 3-6 mg/kg/dose (trimethoprim component) PO BID (max 160 mg TMP/dose)
 - NOTE:** At CMH, there are increasing rates of *E coli* resistance to TMP/SMX
 - Nitrofurantoin (treatment duration **5-7 days**)
 - Macrocrystal (Macrocrystal[®] or Furadantin[®]) 1.25-1.75 mg/kg/dose PO q6h (max 100 mg/dose) =
 - Macrocrystal/monohydrate (Macrobid[®]) 100 mg PO BID **FOR ADOLESCENTS ONLY**

NOTE: Cefdinir should not be used for UTI due to poor urine concentration

Pyelonephritis (febrile urinary tract infection) in children > 2 months of age (AAP guidelines 2011)⁵

Evaluate need for admission

General indications for admission include age < 2 months, ill appearance, poor intake, unable to tolerate oral antibiotic, vomiting, immune compromise, urinary tract obstruction and/or culture-positivity for bacteria known to be resistant to oral antibiotics

If history of UTIs, empiric therapy should be based on previous microbiology if available

- Duration: 7-14 days
- First line:
 - Cephalexin 25-33 mg/kg/dose PO TID (max 1500 mg/day)
- Alternative therapies:
 - Cefixime 8 mg/kg/dose PO qDay (max 400 mg/day)
 - Amoxicillin/clavulanate 13.3 mg/kg/dose (amoxicillin component) PO TID (max 500 mg amoxicillin/dose)
- Severe penicillin allergy (e.g. anaphylaxis) /cephalosporin allergy:
 - TMP/SMX 3-6 mg TMP/kg/dose (trimethoprim component) PO BID (max 160 mg TMP/dose)
NOTE: At CMH, there are increasing rates of *E coli* resistance to TMP/SMX
 - Ciprofloxacin 10 mg/kg/dose PO BID (max 500 mg/dose)

NOTE: Cefdinir should not be used for UTI due to poor urine concentration

Skin and soft tissue infections ([IDSA guidelines 2014](#))⁶

- Impetigo
 - Mild cases with few lesions
 - Topical mupirocin TID x 5 days
 - Topical retapamulin BID x 5 days
 - Numerous lesions or outbreaks involving several patients
 - Duration: 5-7 days
 - First line treatment:
 - Cephalexin 9-17 mg/kg/dose PO TID (max 250 mg/dose) x 5-7 days
 - Alternative therapies:
 - Amoxicillin/clavulanate 12.5 mg/kg/dose (amoxicillin component) PO BID (max 875 mg/dose) x 5-7 days
 - If MRSA suspected or confirmed (i.e. personal or family history of MRSA) AND/OR severe penicillin/cephalosporin allergy:
 - Clindamycin 7 mg/kg/dose PO TID (max 450 mg/dose) x 5-7 days
 - TMP-SMX 4-6 mg/kg/dose (trimethoprim component) PO BID (max 160 mg TMP/dose) x 5-7 days

- Cellulitis
 - Duration: 5-7 days
 - First line:
 - Cephalexin 17 mg/kg/dose PO TID (max 500 mg/dose)
 - If cephalosporin allergy OR MRSA suspected (i.e. personal or family history of MRSA):
 - Clindamycin 10 mg/kg/dose PO TID (max 450 mg/dose)

- Abscess:

In addition to incision and drainage with culture:

 - Duration: 5-7 days
 - Clindamycin 10 mg/kg/dose PO TID (max 450 mg/dose)
 - OR
 - TMP-SMX 4-6 mg/kg/dose (trimethoprim component) PO BID (max 160 mg TMP/dose)

Animal/Human bites⁶

- Duration:
 - Prophylaxis (for moderate to severe wounds with edema or crush injury, puncture wounds or facial bite wounds): 3 days
 - Treatment of infected wound: 5-10 days
- First line:
 - Amoxicillin/clavulanate 22.5 mg/kg/dose (amoxicillin component) PO BID (max 875 mg amoxicillin/dose)
- Penicillin allergy:
 - Clindamycin 10 mg/kg/dose PO TID (max 450 mg/dose) **PLUS** TMP-SMX 5 mg/kg (trimethoprim component) PO BID (max 160 mg TMX/dose)

Dental abscess

Assess for complicated infection (i.e. ill-appearing, signs of deep neck space infection, osteomyelitis of the mandible)

- Duration: 10 days
- First line:
 - Amoxicillin 17 mg/kg/dose PO **TID** (max 500 mg/dose)
- Alternative for complicated infections or amoxicillin failure
 - Amoxicillin/clavulanate 25 mg/kg/dose (amoxicillin component) PO BID (max 875 mg amoxicillin/dose)
- If buccal involvement AND/OR penicillin allergy:
 - Clindamycin 10 mg/kg/dose PO TID (max 450 mg/dose)

Acute lymphadenitis

- First line:
 - Cephalexin 17-25 mg/kg/dose PO TID (max 1000 mg/dose) x 7-10 days
- Alternative therapy:
 - Amoxicillin/clavulanate 22.5 mg/kg/dose (amoxicillin component) PO BID x 7-10 days (max 875 mg amoxicillin/dose)
- If concern for MRSA (i.e. personal or family history of MRSA) AND/OR severe penicillin or cephalosporin allergy:
 - Clindamycin 10 mg/kg/dose PO TID (max 450 mg/dose) x 7-10 days
- If concern for *Bartonella henselae* (treatment may shorten duration of adenopathy):
 - Azithromycin 12 mg/kg PO qDay (max 500 mg/dose) x 5 days

Dosing of amoxicillin-clavulanate

NOTE: Dosing of amoxicillin-clavulanate (Augmentin®) is based on amoxicillin component. “High dose” of amoxicillin-clavulanate is targeted at providing higher amoxicillin doses to overcome *Streptococcus pneumoniae* resistance while keeping within recommended dosing range for clavulanate (about 6-10 mg/kg/day)

General Guidelines for Dosage Formulations			
Indication		< 40 kg	> 40 kg
Infection in ≤ 3 months of age	Formulation	Augmentin™ 250 mg-62.5mg/5mL OR 125mg-31.25mg/5mL suspension	Not applicable
	Usual Dosing	30 mg/kg/day divided twice daily	
Less severe infections (≥ 3 months of age)	Formulation	Augmentin™ 400 mg-57mg/5 mL suspension	Augmentin™ 500mg-125mg or 875mg-125mg tablet OR 400 mg-57mg/5mL suspension
	Usual Dosing	25 – 45 mg/kg/day divided twice daily	500 – 875 mg twice daily
Otitis Media, pneumonia, or refractory sinusitis (≥ 3 months)	Formulation	Augmentin™ ES 600mg-42.9mg/5mL suspension	Augmentin™ XR 1000mg-62.5mg tablet OR Augmentin™ ES 600 mg/5mL suspension
	Usual Dosing	80 – 100 mg/kg/day divided twice or three times daily	1000 – 2000 mg twice daily
**Prescribing practices may deviate from these guidelines depending on clinical factors (e.g. location of infection, bacterial susceptibility, patient characteristics, etc). Please consult a pharmacist or Antimicrobial Stewardship for additional assistance in selecting formulations.			

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