Respiratory Tract Infections

INFECTION	MOST LIKELY ORGANIMS	THERAPY CATEGORY	ANTIMICROBIALS	COMMENTS
PNEUMONIA • less than 4 weeks of age • community-acquired	Group B strep *Enterobacteriales* Respiratory viruses B. *pertussis* P. *jirovecii* (if immunosuppression considered)	First line	**Ampicillin IV**: Lexicomp dosages + **Gentamicin* IV**: Lexicomp dosages **OR** **If meningitis suspected, replace gentamicin by:** **Cefotaxime IV** Lexicomp dosages	Antibiotics should ideally be initiated after blood, urine and CSF cultures have been sent. * Refer to Protocol for the Use and Therapeutic Drug Monitoring of Aminoglycosides at the Montreal Children's Hospital (MCH)
PNEUMONIA • 1-3 months of age • community-acquired	Respiratory viruses Strep *pneumoniae* Group A strep Staph *aureus* H. *influenzae* Group B strep C. *pneumoniae* (especially if afebrile) B. *pertussis* P. *jirovecii* (if immunosuppression considered)	First line	**Outpatient:** **Amoxicillin 90 mg/kg/DAY PO DIVIDED q8h** (max. 4 g/**DAY**) **Inpatient:** **Ampicillin 50 mg/kg/dose IV q6h** (max. 2 g/dose) **If suspected sepsis/meningitis, use instead:** **Ceftriaxone IV** (*refer to respective sections)*	Antibiotics should only be administered if there are epidemiologic and/or clinical reasons to suspect a bacterial etiology.
		Penicillin allergy	**Outpatient:** **Cefuroxime axetil 15 mg/kg/dose PO q12h** (max. 500 mg/dose) **Inpatient:**	

			Ceftriaxone 50 mg/kg/dose IV q24h (max. 2 g/dose)	
PNEUMONIA (MILD) • more than 3 months of age • mild (outpatient) • community-acquired	Respiratory viruses Strep *pneumoniae* Group A strep Staph *aureus* H. *influenzae* Atypicals (M. *pneumoniae* C. *pneumoniae*) in school-aged children and adolescents	First line	**Amoxicillin 90 mg/kg/DAY PO DIVIDED q8h** (max. 4 g/**DAY**) **OR** **If antibiotic use in last 30 days or unimmunized against H. *influenzae* type b, use instead:** **Amoxicillin-clavulanate 90 mg/kg/DAY PO DIVIDED q8h** (max. 4 g/**DAY**)* **If clinical picture most compatible with atypical pneumonia**:** **Clarithromycin 7.5 mg/kg/dose PO q12h** (max. 500 mg/dose) **OR** **Azithromycin 10 mg/kg/dose PO once on day 1** (max. 500 mg/dose), **then 5 mg/kg/dose PO q24h on days 2-5** (max. 250 mg/dose)	Unless clinical evaluation and/or radiographic signs are strongly suggestive of a bacterial etiology, antimicrobial therapy is not routinely required for preschool-aged children because viral pathogens are responsible for the great majority of clinical disease. *Other option: **Amoxicillin 45 mg/kg/DAY PO DIVIDED q8h** **+** **Amoxicillin-clavulanate 45 mg/kg/DAY PO DIVIDED q8h** (max. 4 g (amox)/**DAY**) **Lab testing for M. *pneumoniae* and C. *pneumoniae* by PCR can be considered.
		Penicillin allergy	**Cefuroxime axetil 15 mg/kg/dose PO q12h** (max. 500 mg/dose)	
PNEUMONIA (MODERATE)	Respiratory viruses Strep *pneumoniae*	First line	**Ampicillin 50 mg/kg/dose IV q6h** (max. 2 g/dose)	*Lab testing for M. *pneumoniae* and C. *pneumoniae* by nasopharyngeal PCR

• more than 3 months of age • moderate (requiring hospitalization) • community-acquired	Group A strep Staph *aureus* Atypicals (M. *pneumoniae* C. *pneumoniae*)		**If suspicion of atypical organism*, ADD:** **Azithromycin 10 mg/kg/dose PO/IV once on day 1** (max. 500 mg/dose), **then 5 mg/kg/dose PO/IV q24h on days 2-5** (max. 250 mg/dose) **During influenza season, ADD:** **Oseltamivir PO** (*refer to MCH formulary for dosing*)	can be considered.
		Penicillin allergy	**Ceftriaxone 50 mg/kg/dose IV q24h** (max. 2 g/dose)	
PNEUMONIA (SEVERE) • more than 3 months of age • severe (respiratory failure and/or septic shock) • community-acquired	Strep *pneumoniae* Group A strep Staph *aureus* Atypicals (M. *pneumoniae* C. *pneumoniae*) in school-aged children and adolescents	First line	**Ceftriaxone 50-100 mg/kg/dose IV q24h** (max. 2 g/dose) **AND** **Azithromycin 10 mg/kg/dose PO/IV once on day 1** (max. 500 mg/dose), **then 5 mg/kg/dose PO/IV q24h on days 2-5** (max. 250 mg/dose) **If suspicion of Staph *aureus* (based on clinical, laboratory and/or imaging findings)*, ADD:** **Vancomycin ** 15 mg/kg/dose IV q6h** **OR** **Clindamycin 40 mg/kg/DAY PO/IV DIVIDED q8h** (max. 900 mg/dose IV and 600 mg/dose PO) **During influenza season,**	Lab testing for M. *pneumoniae* and C. *pneumoniae* by nasopharyngeal PCR can be considered. *After having obtained nasal and throat (or perianal) swabs for MRSA screening. ** Refer to the Guidelines for the prescription and the therapeutic drug monitoring of vancomycin at the Montreal Children's Hospital

			ADD: **Oseltamivir PO** (*refer to MCH formulary for dosing*)	
		Penicillin allergy	Same	
COMPLICATED PNEUMONIA • parapneumonic effusion • empyema • community-acquired	S. *pneumoniae* Group A strep Staph *aureus* Atypicals (M. *pneumoniae* C. *pneumoniae*)	First line	**Ceftriaxone 75-100 mg/kg/dose IV q24h** (max. 2 g/dose) **If suspicion of atypical organism*, ADD:** **Azithromycin 10 mg/kg/dose PO/IV once on day 1** (max. 500 mg/dose), **then 5 mg/kg/dose PO/IV q24h on days 2-5** (max. 250 mg/dose) **If suspicion of Staph *aureus* (based on clinical, laboratory and/or imaging findings)****, ADD: **Vancomycin*** 15 mg/kg/dose IV q6h**	*Lab testing for M. *pneumoniae* and C. *pneumoniae* by nasopharyngeal PCR can be considered. ** After having obtained nasal and throat (or perianal) swabs for MRSA screening. *** Refer to the Guidelines for the prescription and the therapeutic drug monitoring of vancomycin at the Montreal Children's Hospital
		Penicillin allergy	Same	
ASPIRATION PNEUMONIA • community-acquired	Polymicrobial (oral aerobes and anaerobes)	First line	**Outpatient:** **Amoxicillin-clavulanate 90 mg/kg/DAY PO DIVIDED q8h** (max. 4 g/**DAY**)* **Inpatient:** **Amoxicillin-clavulanate 25 mg/kg/dose IV q8h** (max. 1000 mg/dose) **If suspected or known colonization with resistant gram-negative**	Antibiotics **not** recommended if early symptoms of chemical pneumonitis only. *Other option: **Amoxicillin 45 mg/kg/DAY PO DIVIDED q8h** **AND** **Amoxicillin-clavulanate 45 mg/kg/DAY PO DIVIDED q8h**

			rods or *Pseudomonas*, use instead: **Piperacillin-Tazobactam 80-100 mg/kg/dose IV q6h** (max. 16 g/**DAY**) (*refer to MCH formulary*)	(max. 4 g (amox)/**DAY**)
		Penicillin allergy	**Outpatient:** **Clindamycin 20-40 mg/kg/DAY PO DIVIDED q8h** (max. 600 mg/dose) **Inpatient:** Same **OR** **If suspected or known colonization with *Pseudomonas*, use instead:** **Meropenem 20 mg/kg/dose IV q8h** (max. 2 g/dose)	
LUNG ABCESS • community-acquired	Staph *aureus* Group A strep Strep *pneumoniae* Oral aerobes and anaerobes (if secondary to aspiration)	First line	**Secondary to complicated community-acquired pneumonia (empyema):** **Ceftriaxone 75-100 mg/kg/dose IV q24h** (max. 2 g/dose) **OR** **Cannot exclude aspiration or other etiologies:** **Amoxicillin-clavulanate 25 mg/kg/dose IV q8h** (max. 1 g/dose) **If suspicion of MRSA, ADD*:** **Vancomycin** 15 mg/kg/dose IV q6h**	*After having obtained nasal and throat (or perianal) swabs for MRSA screening. ** Refer to the Guidelines for the prescription and the therapeutic drug monitoring of vancomycin at the Montreal Children's Hospital
		Penicillin allergy	**Ceftriaxone 75-100 mg/kg/dose IV q24h** (max. 2 g/dose)	

			If suspicion of MRSA, ADD*: **Vancomycin** 15 mg/kg/dose IV q6h**	
PNEUMONIA (HEALTHCARE ASSOCIATED) INCLUDING: • aspiration pneumonia in hospitalized patient • ventilator-associated pneumonia (patients in PICU and NICU)	Staph *aureus* *Enterobacteriales* *Pseudomonas* A. *baumannii*	First line	**Piperacillin-tazobactam 100 mg/kg/dose IV q8h** (max. 4 g/dose) *Refer to MCH formulary for neonatal dosages* **If severe, replace by:** **Meropenem 20 mg/kg/dose IV q8h (max. 2 g/dose)** Refer to MCH formulary for neonatal dosages	
		Penicillin allergy	**Meropenem 20 mg/kg/dose IV q8h** (max. 2 g/dose)	
SICKLE CELL ACUTE CHEST CRISIS	Strep *pneumoniae* Staph *aureus* Group A strep Atypicals (M. *pneumoniae* C. *pneumoniae*)	First line	**Cefotaxime 50 mg/kg/dose IV q8h** (max. 2 g/dose) **AND** **Azithromycin 10 mg/kg/dose PO/IV once on day 1** (max. 500 mg/dose), **then 5 mg/kg/dose PO/IV q24h on days 2-5** (max. 250 mg/dose)	
		Penicillin allergy	Same	
INFLUENZA-LIKE ILLNESS	Influenza A, B	First line	**Oseltamivir PO**: Lexicomp dosages **If cannot tolerate or absorb oseltamivir, or if oseltamivir resistance suspected in lab-confirmed influenza infection, consult pediatric ID**	Treatment is required only for high-risk patients or those requiring hospitalization due to influenza. Discontinue if naso-pharyngeal viral PCR negative for influenza. Duration: 5 days

REFERENCES:

Empiric Antimicrobial Therapy Guide: Version 9, May2025

Hôpital de Montréal pour enfants
Centre universitaire de santé McGill

Montreal Children's Hospital
McGill University Health Centre