

Rhinosinusitis (Acute and Chronic): Adult & Pediatric

Ears, Eyes, Nose, Throat and Mouth

Clinical Decision Tools for RNs with Additional Authorized Practice [RN(AAP)s]

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Background

Rhinosinusitis is inflammation and/or infection of the mucosal lining of the paranasal sinuses with the anterior ethmoid and maxillary sinuses most affected (Reinoso, Dunphy, & Porter, 2019). The terms rhinosinusitis and sinusitis are used interchangeably because inflammation of the sinuses rarely occurs without concurrent inflammation of the nasal mucosa (Reinoso et al., 2019). This condition is further subdivided into acute and chronic rhinosinusitis. Acute rhinosinusitis is where symptoms are present for less than four weeks duration. Chronic rhinosinusitis is defined as more than four acute episodes of sinusitis per year, or current symptoms are present for eight to 12 weeks, or longer (Anti-infective Review Panel, 2019). Most cases (98-99.5%) of infections are viral (Anti-infective Review Panel, 2019; Reinoso et al., 2019). If bacterial, the most common organisms include *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis* and *Staphylococcus aureus*. Fungal causes are not common and are usually diagnosed in immunocompromised individuals (Reinoso et al., 2019).

Immediate Consultation Requirements

The RN(AAP) should seek immediate consultation from a physician/NP when any of the following circumstances exist:

- infant less than one year of age;
- systemic toxicity (systemic inflammatory response syndrome or sepsis);
- altered mental status;
- severe headache;
- swelling of the orbit or change in visual acuity;
- black, necrotic tissue or discharge;
- infraorbital hypesthesia; and/or
- suspect anatomical abnormalities (Anti-infective Review Panel, 2019; Interprofessional Advisory Group [IPAG], personal communication October 20, 2019).

Predisposing and Risk Factors

Predisposing and risk factors for rhinosinusitis include:

- preceded by an upper respiratory viral infection (e.g., common cold),
- allergies,
- deviated nasal septum,
- smoking,
- adenoidal hypertrophy,
- dental abscess,
- nasal polyps,
- trauma,
- foreign body,
- diving or swimming,
- neoplasms,
- cystic fibrosis,
- immunocompromised clients (e.g., diabetes, HIV),
- inflammatory disorders such as Wegener's granulomatosis or sarcoidosis,
- sniffing substances that irritate the lining of the nose (e.g., cocaine), and/or
- pregnancy (Reinoso et al., 2019).

Health History and Physical Exam

Subjective Findings

The circumstances of the presenting complaint should be determined. These may include:

- general malaise;
- fever;
- headache;
- facial pain;
- nasal congestion;
- pressure over involved sinuses exacerbated with bending forward;
- purulent nasal discharge, which may be tinged with blood;
- dental pain, especially of upper incisor and canine teeth;
- postnasal drainage;
- hyposmia/anosmia; and/or
- ear pressure/fullness (Reinoso et al., 2019).

Objective Findings

Physical findings consistent with acute rhinosinusitis may include:

- mildly elevated temperature,
- mildly to moderately ill appearance,

- irritation of skin around nares,
- swollen nasal mucosa with a pale or dull red appearance,
- nasal polyp(s),
- dental abscess,
- tenderness over involved sinuses,
- poor transillumination of sinuses,
- tenderness over a tooth,
- anterior cervical nodes may be enlarged and tender, and/or
- cough (Reinoso et al., 2019).

Physical findings consistent with chronic rhinosinusitis may include:

- pale and boggy nasal mucous membranes, and/or
- tenderness may be present over sinuses (Reinoso et al., 2019).

Differential Diagnosis

The following should be considered as part of the differential diagnosis for acute rhinosinusitis:

- dental abscess,
- nasal polyp(s),
- tumour,
- foreign body,
- periorbital cellulitis,
- upper respiratory tract infection,
- allergic rhinitis,
- vasomotor rhinitis,
- tension headache,
- cluster headache, and/or
- migraine headache (Reinoso et al., 2019).

The following should be considered as part of the differential diagnosis for chronic rhinosinusitis:

- allergic rhinitis,
- vasomotor rhinitis,
- nasal polyp(s),
- infection of upper respiratory tract,
- tumour,
- migraine headache,
- cluster headache, and/or
- dental abscess (Reinoso et al., 2019).

Making the Diagnosis

Diagnosis is usually made by history and physical exam. There is no way to differentiate between viral and bacterial causes clinically, but viral is the most common cause. Acute bacterial rhinosinusitis must be distinguished from acute rhinosinusitis due to viral respiratory infections and non-infectious conditions, and only diagnosed when signs and symptoms including purulent nasal drainage, nasal congestion, and/or facial pain-pressure persist without improvement for at least 10 days or if signs and symptoms worsen within 10 days after initial improvement (Anti-infective Review Panel, 2019).

The diagnosis of chronic rhinosinusitis is made when the client presents with two or more of the following symptoms: 1) mucopurulent discharge, 2) nasal congestion, 3) facial pain-pressure-fullness, or 4) decreased sense of smell for a period of eight to 12 weeks or has four documented episodes of acute rhinosinusitis in 12 months with periods of remission between episodes (Anti-infective Review Panel, 2019).

Investigations and Diagnostic Tests

Investigations and diagnostic tests are not recommended for acute rhinosinusitis (Anti-infective Review Panel, 2019). Clients with symptoms suggestive of chronic rhinosinusitis may benefit from diagnostic tests to rule out anatomical abnormalities (Anti-infective Review Panel, 2019).

Management and Interventions

Goals of Treatment

The primary goals of treatment are to provide symptomatic care and pain relief, prevent complications, and identify predisposing or underlying factors (Anti-infective Review Panel, 2019).

Non-Pharmacological Interventions

The RN(AAP) should recommend, as appropriate, non-pharmacological options: warm facial packs, saline nasal irrigation (150 mL daily) and/or saline nasal spray tid to qid prn (Reinoso et al., 2019).

Pharmacological Interventions

The pharmacological interventions recommended for the treatment of acute and chronic rhinosinusitis are in accordance with the RxFiles: Drug Comparison Charts (RxFiles Academic Detailing Program, 2021), Anti-infective Guidelines for Community-acquired Infections (Anti-infective Review Panel, 2019), and CPS Drug Information (Canadian Pharmacist Association, 2021).

Rhinosinusitis, acute and chronic, should be managed using analgesics/antipyretics, decongestants, and intranasal (topical) steroid preparations. Antibiotics should only be used if symptoms last longer than seven to 10 days, improve and then worsen, or are very severe

(Choosing Wisely Canada, 2019). Information specific to the pharmacological management of pediatric clients with rhinosinusitis is provided in the following charts.

Analgesics and Antipyretics

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 1 year of age)					
	Acetaminophen	10-15 mg/kg/dose (maximum daily dose of 75 mg/kg/day)	p.o.	q4-6h prn	5-7 days
AND/ OR	Ibuprofen	5-10 mg/kg/dose (maximum daily dose of 40 mg/kg/day)	p.o.	q6-8h prn	5-7 days
Adult					
	Acetaminophen	500-1000 mg (maximum daily dose of 4 g/day)	p.o.	q4-6h prn	5-7 days
AND/ OR	Ibuprofen (preferred)	400 mg (maximum daily dose of 1600 mg/day)	p.o.	q6-8h prn	5-7 days

Decongestants

Nasal (topical) decongestant sprays or drops may be used for the first three days if congestion is marked. Although nasal (topical) decongestants are more effective than oral ones, it is important to limit their use to prevent rhinitis medicamentosa (rebound nasal congestion) when the nasal spray is withdrawn. Decongestants are not recommended in children under the age of six.

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 6 to ≤ 12 years of age)					
	Pseudoephedrine (Sudafed)	30 mg (maximum daily dose of 120 mg/day)	p.o.	q4-6h prn	7-10 days

Pediatric (> 12 years of age) and Adult					
	Pseudoephedrine (Sudafed)	60 mg (maximum 120 mg/day)	p.o.	q4-6h prn	7-10 days
OR	Pseudoephedrine XR (Sudafed)	120 mg	p.o.	q12h prn	7-10 days
	Drug	Dose	Route	Frequency	Duration
OR	Xylometazoline (Otrivin), 0.1% nasal spray	2-3 sprays in each nostril	intranasally	q8-12h prn	3 days

Intranasal Corticosteroids

Short term use of topical corticosteroids is common, but their use should be limited as some studies have shown that they increase viral load (Reinoso et al., 2019). Intranasal steroids are not recommended in children under the age of three.

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 3 of age) and Adult					
	Fluticasone (Flonase) 50 mcg per actuation	2 sprays in each nostril	intranasally	once daily	7-10 days
OR	Mometasone (Nasonex) 50 mcg per actuation	2-4 sprays in each nostril	intranasally	b.i.d.	7-10 days

Oral Antibiotics

Most cases of acute sinusitis will resolve without antibiotic treatment. Consider antibiotics if symptoms continue for longer than 10 days or worsen after five days. In healthy adults suffering from acute rhinosinusitis, short courses (e.g., five days) have the same benefits as longer courses of therapy (e.g., 10 days), with less harm. Antibiotics are of limited value in managing chronic rhinosinusitis. Guidelines recommend high-dose amoxicillin for greater effectiveness in infections commonly caused by intermediate-resistant *Streptococcus pneumoniae*. High dose amoxicillin should be considered in the following client populations: antibiotic use in the past month, age >65 or <2, daycare or close contact with child in daycare, recent hospitalization, and/or immunocompromised.

	Drug	Dose	Route	Frequency	Duration
Pediatric (≥ 1 year of age not allergic to penicillin)					
	Amoxicillin	40-45 mg/kg day (maximum daily dose of 1500 mg/day)	p.o.	divided t.i.d.	10 days
OR	High dose Amoxicillin	90 mg/kg/day (maximum daily dose of 3 g/day; this dose provides coverage of most <i>S. pneumoniae</i> strains)	p.o.	divided b.i.d.	10 days
Pediatric (≥ 1 year of age allergic to penicillin)					
	Clarithromycin	15 mg/kg/day (maximum daily dose of 1000 mg/day)	p.o.	divided b.i.d.	5-10 days
OR	Azithromycin	10 mg/kg orally on day 1, then 5 mg/kg on days 2-5 (maximum daily dose of 500 mg/day on day 1, and 250 mg/day on days 2-5)	p.o.	once daily	5 days
Pediatric (≥ 8 year of age allergic to penicillin)					
	Doxycycline	4 mg/kg/day (maximum daily dose of 200 mg/day on day 1, and then maximum daily dose of 100 mg/day for remaining days)	p.o.	b.i.d.	10 days
Adult (not allergic to penicillin)					
	Amoxicillin	500-1000 mg	p.o.	t.i.d.	5-7 days

	Drug	Dose	Route	Frequency	Duration
Adult (allergic to penicillin)					
	Doxycycline	100 mg	p.o.	b.i.d. on day 1 and then once daily	5-7 days
OR	Azithromycin	250 mg tablets (500 mg on day 1 and then 250 mg daily)	p.o.	daily	5 days
OR	Clarithromycin	500 mg	p.o.	b.i.d.	5-7 days
OR	Clarithromycin XL	1000 mg	p.o.	daily	5-7 days

Client and Caregiver Education

The RN(AAP) provides client and caregiver education as follows:

- Counsel about appropriate use of medications (dose, frequency, application, compliance, etc.).
- Avoid the use of antihistamines as these dry and thicken secretions.
- Recommend increased rest during the acute phase.
- Recommend appropriate hydration (six to eight glasses of fluid per day).
- Recommend avoidance of irritants (e.g., smoke).
- Recommend refraining from swimming, diving or flying during the acute phase (Reinoso et al., 2019).

Monitoring and Follow-Up

The RN(AAP) should instruct the client to return to the clinic for reassessment if symptoms do not improve in 48-72 hours. Immunocompromised clients should seek immediate medical advice if they become systemically unwell (Reinoso et al., 2019).

Complications

The following complications of rhinosinusitis may include:

- visual impairments,
- ophthalmoplegia,
- orbital or facial cellulitis,
- severe fever,
- aphasia,
- abducens palsy (cranial nerve VI),
- seizures,
- osteomyelitis,
- meningitis,

- subdural empyema,
- epidural abscess, and
- cavernous sinus thrombosis (Reinoso et al., 2019).

Referral

Refer to a physician/NP if client presentation is consistent with those identified in the *Immediate Consultation Requirements* section; if there is a failure to respond to the prescribed treatment in three to four days and the client remains unwell; or if the client has a hoarse voice as the only symptom for more than three weeks duration which could be suggestive of laryngeal pathology (IPAG, personal communication, October 20, 2019).

References

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- Choosing Wisely Canada. (2019). *Five things physicians and patients should question in Otolaryngology: Rhinology*. <https://choosingwiselycanada.org/otolaryngology/>
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