

Dental Abscess: Primary and Permanent Teeth

Ears, Eyes, Nose, Throat and Mouth

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

Effective Date: May 4, 2022

Background

Dental abscess is an acute infection of the teeth or the structures supporting the teeth and/or gums. Twenty primary teeth typically erupt between six months and two years of age (Stephens, Wiedemer, & Kushner, 2018). The typical adult has 32 permanent teeth which begin to erupt at about age six with the process complete by age 18 (Stephens et al., 2018). Dental abscesses are the result of untreated dental caries (Stephens et al., 2018). There are two types of dental abscess including apical and periodontal (Hallman, 2022; Sanders & Houck, 2022). Apical abscesses are the most common and originate in the dental pulp (Hallman, 2022; Sanders & Houck, 2022). Periodontal abscesses originate in the supporting structure of the teeth, between teeth and gums, and are usually a result of chronic periodontitis (Hallman, 2022).

Most commonly dental abscesses are caused by a combination of oral streptococci (especially the *Streptococcus anginosus* group), and strict anaerobes (such as anaerobic streptococci, *Prevotella* species, and *Fusobacterium* species) (Hallman 2022; Samaranayake, 2018).

Immediate Consultation Requirements

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

- gingival or facial cellulitis with or without lymphadenopathy;
- changes in vision;
- any signs of ascending infection to the brain (e.g., fever, visual changes, pain with extra ocular movements, altered level of consciousness);
- difficulty in opening the mouth (trismus);
- raised tongue and floor of mouth;
- significant swelling of the floor of the mouth;

- dysphagia or difficulty speaking, or drooling;
- signs of sepsis (e.g., fever, tachycardia, hypotension, tachypnea, altered mental status);
- neck stiffness; or
- immunocompromised client (Interprofessional Advisory Group [IPAG], personal communication August 28, 2019; Hallman, 2022).

Predisposing and Risk Factors

Predisposing and risk factors for dental abscess of both primary and permanent teeth include:

- deep caries,
- poor dental hygiene,
- dental trauma,
- low socioeconomic groups with limited or no access to a dentist, and
- immunocompromised clients (e.g., uncontrolled diabetes, elderly) (Hallman, 2022; Sanders & Houck, 2022).

Health History and Physical Exam

Subjective Findings

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

- localized tooth pain of sudden onset and worsening over a few hours to a few days;
- pain which radiates to ear, lower jaw, neck on the same side as the dental abscess;
- swelling inside the mouth;
- constant deep, throbbing pain that worsens when lying down;
- pain that gets worse with mastication or tapping of the affected tooth;
- presence of a loose tooth;
- pain on palpation to the surrounding gum;
- decrease in pain once the pus starts draining;
- complaints of a bad taste in the mouth;
- fever and malaise; or
- stiffness or pain in the neck, trismus, or dysphagia suggest complications (Holmberg, Hellmich, & Homme, 2017; Hallman, 2022).

The RN(AAP) should enquire about:

- dental hygiene such as frequency of brushing and flossing;
- bottle propping;
- previous dental procedures;
- recent facial or dental trauma;
- drug-induced gum conditions (e.g., phenytoin, calcium channel blockers, cyclosporine);
- stiffness or pain in the neck, trismus, or dysphagia;
- comorbid disease conditions such as diabetes or other immunocompromised states; and

- smoking (Sanders & Houck, 2022; Stephens et al., 2018).

Objective Findings

The signs and symptoms of dental abscess may include:

- fever (rare but possible);
- facial swelling, localized to side of affected tooth;
- carious tooth;
- gingival edema and erythema;
- tooth mobility;
- purulent drainage near affected site;
- an elevated or discoloured tooth with increased mobility and tenderness;
- localized tooth pain and tenderness on percussion;
- pain on palpation of surrounding gum;
- localized tenderness over affected area of jaw;
- anterior cervical nodes enlarged and tender;
- regional lymphadenopathy, which suggests progressing infection involving the head and neck, which could lead to airway compromise (Hallman, 2022; Sanders & Houck, 2022; Stephens et al., 2018).

Differential Diagnosis

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

- disease of the salivary gland (e.g., parotitis),
- pulpitis,
- sinusitis,
- cellulitis,
- migraine,
- sialolithiasis (salivary calculi),
- maxillary sinusitis,
- myofascial inflammation,
- temporomandibular joint (TMJ) dysfunction,
- trigeminal neuralgia,
- giant cell arteritis,
- otitis externa,
- otitis media,
- unerupted teeth,
- neoplasm,
- localized lymphadenopathy, or
- trauma (Dynamed, 2018; Sanders & Houck, 2022).

Making the Diagnosis

Diagnosis is based on history and clinical findings.

Investigations and Diagnostic Tests

No investigations or diagnostic tests are recommended.

Management and Interventions

Goals of Treatment

The primary goals of immediate treatment are to relieve symptoms, treat and prevent the spread of infection.

Non-Pharmacological Interventions

The RN(AAP) should recommend, as appropriate, warm saline oral rinses several times per day and ice packs for 10-15 minutes prn.

Pharmacological Interventions

The pharmacological interventions recommended for the treatment of dental abscess of the primary and permanent teeth are in accordance with the *Evidence-based clinical practice guideline on antibiotic use for the urgent management of pulpal- and periapical-related dental pain and intraoral swelling: A report from the American Dental Association* (Lockhart, Tampi, Abt, Aminoshariae, Durkin, Fouad, Gopal, Hatten, Kennedy, Lang, Patton, Paumier, Suda, Pilcher, Urquhart, O'Brien, & Carrasco-Labra, 2019), *Policy on acute pediatric dental pain management* (American Academy of Pediatric Dentistry, 2021), *RxFiles: Drug Comparison Charts* (RxFiles Academic Detailing Program, 2021), and *Dental Problems in Primary Care* (Stephens et al., 2018).

Oral Antibiotics

Do not routinely provide repeat treatments or switch antibiotics when a client fails to respond to initial treatment as it may mask underlying complications (sinus or dental cyst), consult a physician/NP.

	Drug	Dose	Route	Frequency	Duration
Pediatric ≤ 40 kg (without penicillin allergy)					
	Amoxicillin	20-40 mg/kg/day to a maximum daily dose of 1500 mg/day	p.o.	q8h	3-7 days

	Drug	Dose	Route	Frequency	Duration
OR	Amoxicillin/ clavulanate (7-1 formulation)	25-45 mg/kg/day to a maximum daily dose of 1750 mg	p.o.	divided b.i.d.	5-7 days
Pediatric (without penicillin allergy)					
	Penicillin V (Potassium)	25-50 mg/kg/day to a maximum dose of 2400 mg/day	p.o.	divided q6h	3-7 days
OR	Cephalexin	25-50 mg/kg/day to a maximum of 4 grams/day	p.o.	divided q6-8h	3-7 days
Pediatric > 40 kg and Adult (without penicillin allergy)					
	Amoxicillin	500 mg	p.o.	t.i.d.	3-7 days
OR	Amoxicillin/ clavulanate (7-1 formulation)	875/125 mg	p.o.	b.i.d.	5-7 days
OR	Penicillin V (Potassium)	300-600 mg	p.o.	q.i.d.	3-7 days
Adult (without penicillin allergy)					
OR	Cephalexin	500-1000 mg (maximum daily dose of 4 grams/day)	p.o.	q6h	3-7 days
Pediatric (with penicillin allergy)					
	MetroNIDAZOLE	15-50 mg/kg/day to a maximum daily dose of 1500 mg/day	p.o.	divided q8h	5-7 days
OR	Clindamycin	10-25mg/kg/day to a maximum of 450mg/dose	p.o.	divided q8h	5-7 days

	Drug	Dose	Route	Frequency	Duration
OR	Clarithromycin	15 mg/kg/day to a maximum of 1000 mg/day	p.o.	divided q12h	5-7 days
Pediatric (≥ 8 years of age with penicillin allergy)					
	Doxycycline	2.2 mg/kg/dose to a maximum of 100 mg/dose	p.o.	q12	5-7 days
Adult (with penicillin allergy)					
	MetroNIDAZOLE	500 mg	p.o.	t.i.d	7 days
OR	Clindamycin	300-450 mg (maximum daily dose of 1.8 grams/day)	p.o.	divided q6-8h	5-7 days
OR	Clarithromycin	500 mg (maximum daily dose of 1000 mg/day)	p.o.	q12h	5-7 days
OR	Doxycycline	100-200 mg/day	p.o.	once daily or divided q12h	5-7 days

Analgesics and Antipyretics

	Drug	Dose	Route	Frequency	Duration
Pediatric					
	Acetaminophen	10-15 mg/kg/dose (maximum dose 75 mg/kg/day)	p.o.	q4-6h prn	5-7 days
AND/ OR	Ibuprofen	5-10 mg/kg/dose (maximum dose 40 mg/kg/day)	p.o.	q6-8h prn	5-7 days

	Drug	Dose	Route	Frequency	Duration
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

Client and Caregiver Education

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

- Counsel about appropriate use of medications (dosage, compliance, side effects, etc.).
- Recommend dietary modifications (cool liquids or soft diet).
- Recommend improvements to dental hygiene.
- Recommend brushing using a soft toothbrush to reduce discomfort and avoid flossing the tooth with the abscess.
- Recommend eating on the other side of the mouth to reduce discomfort and irritation to the abscess.
- If prescribing antibiotics, the RN(AAP) should explain that antibiotic therapy is to reduce the spread of the infection and is not a substitute for dental treatment by a dentist.
- Advise that serious complications may occur if the abscess is not treated correctly by a dental practitioner (Stephens et al., 2018).

Monitoring and Follow-Up

The RN(AAP) should:

- refer all clients or advise them to self-refer to a dentist for follow-up. Incision and drainage of dental abscess by a dentist is first line treatment.
- counsel clients to follow-up if pain becomes worse or there is a concern that the infection is spreading.

Complications

The following complications may be associated with a dental abscess of primary and permanent teeth:

- gingival and/or facial cellulitis;
- maxillary infection, which can spread to the periorbital area and cause vision loss, cavernous sinus thrombosis, and central nervous system (CNS) involvement;
- sepsis;
- deep neck space infection, a rare but life-threatening complication;

- Ludwig's angina;
- recurrent abscess formation; and/or
- fever and regional lymphadenopathy (Dynamed, 2018; Hallman, 2022; Stephens et al., 2018).

Referral

Refer to a physician/NP if the client presentation is consistent with the *Immediate Consultation Requirements* section. Refer to a dentist for definitive therapy such as root canal treatment, dental extraction, or incision and drainage. It is not necessary to have antibiotic coverage before referring to a dentist if there is no cellulitis or the client is not immunocompromised (IPAG, personal communication, August 28, 2019; Stephens et al., 2018; Buonavoglia, Leone, Solimando, Fasano, Malerba, Prete, Corrente, Prati, Vacca, & Racanelli, 2021).

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