

# Emergency Management of Paediatric Dental Emergencies

## Traumatic and Atraumatic Emergency Dental Presentations

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## Purpose

This document is aimed at Medical and Nursing Practitioners providing paediatric emergency care. It is intended to provide guidance to the practitioner for the evaluation and management of children presenting to the emergency with dental complaints, including dental trauma and dental infections.

## Scope

This guideline applies to all staff involved in the care and emergency management of children who present with dental complaints.

## Guideline

Dental infections and injuries can lead to life threatening illnesses and significant morbidity. Children with dental pathology frequently present to Emergency Departments. This guideline aims to provide a simple yet comprehensive basis for the assessment and management of dental complaints and to help prevent progression to more severe conditions. Early review and management by a dentist is vital in minimising unnecessary pain, infective complications and medication (antibiotic and analgesic) usage.

Dental pathologies can be roughly divided into [Infective Conditions](#) and [Traumatic Conditions](#). These will be dealt with separately within this guideline.

Accurate description of dental pathology to specialty teams involves use of the correct dental nomenclature, as well as an understanding of whether you are dealing with primary or adult teeth, as described in [Appendix 1: Dental Nomenclature](#).



## Infective Conditions

Dental infections occur secondary to bacteria penetrating the protective outer enamel layer of the tooth, and can progress from infection of the dentin and pulp, to infection of the alveolar bone, then the soft tissue of the face and neck.

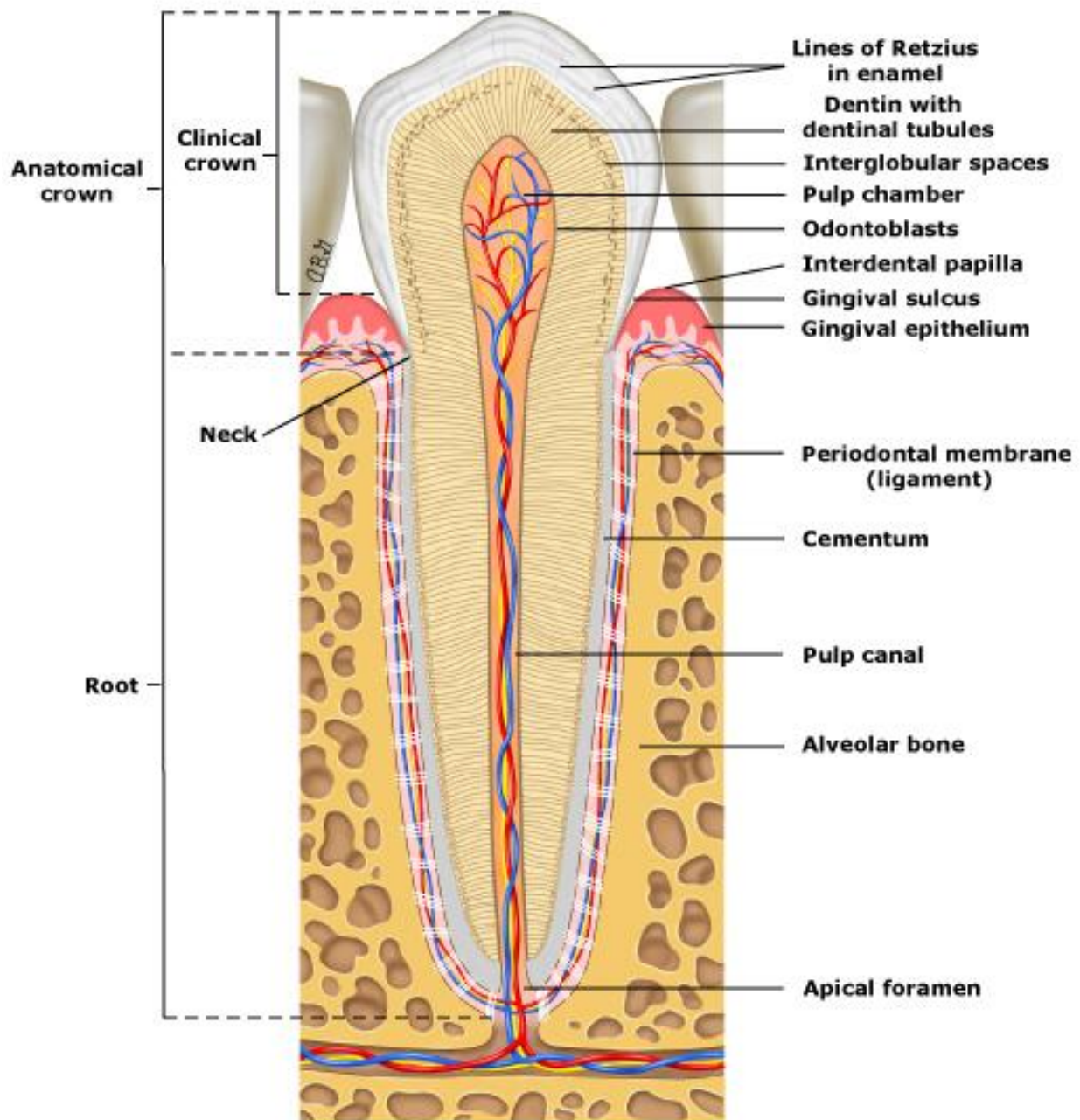


Image 1 – Tooth Anatomy<sup>1</sup>

## **Eruption Cysts**

Eruption cysts or eruption haematomas are dome shaped soft tissue lesions often associated with the eruption of primary or permanent teeth. These are often a common finding especially in neonates and infants. They are caused by fluid and blood accumulation within the follicular space of the erupting tooth.

These cysts are often self-resolving as the tooth erupts and no treatment is required. If not resolved within two weeks, dental review may be required for further management or to rule out other causes<sup>2</sup>. See Image 2 below.



**Image 2 – Eruption Cyst / Haematoma<sup>3</sup>**

**Caries** are localised destruction of the enamel due to bacterial colonisation<sup>4</sup>. They tend to be painless until infection progresses to the inner dentin and pulp, and typically appear as an area of discolouration on the tooth surface. The prevalence of caries in the paediatric population is estimated to be ~ 80% by the end of high school (5).

**Management** = prompt (1-2 weeks) dental review for filling of the defect, and preventative measure to prevent further development (i.e. regular brushing, flossing, reduced ingestion of sugar rich foods)<sup>6</sup>.

Once the enamel is compromised (via caries, dental fracture, or a dental procedure), bacteria can pass through microtubules in the dentin directly to the pulp cavity of the tooth<sup>4</sup>.

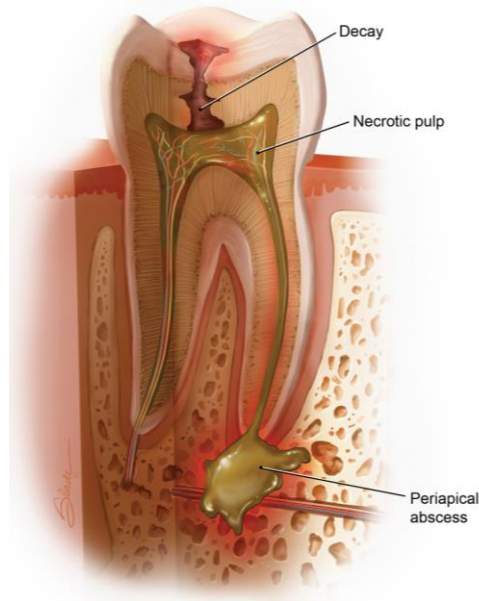
**Pulpitis** refers to acute inflammation of the pulp cavity. Bacteria and toxins from bacteria enter the pulp chamber via a dental cavity. Due to the rigid remaining tooth structure, this causes pressure on the nerves and vessels of the pulp, resulting in pain and ischaemia. Pain from acute pulpitis is typically severe, and is exacerbated by thermal changes (ie hot/cold drinks). The tooth may be sensitive to palpation or percussion.

**Management** of uncomplicated pulpitis (i.e with no evidence abscess formation) in the ED involves provision of adequate analgesia eg NSAIDs, and urgent dental review (1-2 days) for tooth extraction or root canal treatment.

Routine use of antibiotics is NOT recommended (should only be considered if signs of systemic infection)

Routine OPG in ED is necessary only if identification of a periapical abscess would necessitate inpatient management (i.e trismus, fever, swelling below the border of the mandible, immunocompromise). Further and more accurate dental xrays eg periapical xrays to be taken at the dentist.

Infection spreading from the pulp into the alveolar bone results in development of a **Periapical Abscess** (See Image 3 below).



**Image 3 – Periapical Abscess<sup>7</sup>**

A **Periapical Abscess** presents similarly to pulpitis, often preceded by a longer history of pain, along with possible systemic symptoms of fever, nausea/vomiting, and lethargy. The tooth will have tenderness to percussion, and often evidence of the causative caries. Imaging may reveal a periapical radiolucency (See Image 4 below).

**Management** revolves around urgent surgical drainage and removal of necrotic material.

Maxillofacial Surgery should be contacted for consideration of inpatient surgical management *if* there are systemic signs such as trismus, swelling extending below the lower border of the mandible, or in an immunocompromised patient. Otherwise, management should occur via a dentist within 24-48 hours. If dental management cannot occur on the day of review, oral antibiotics are indicated only if there are signs of systemic illness (fevers, nausea/vomiting) (see **Appendix 2: Antibiotic Recommendations**) (patients with normal renal function and no hypersensitivity to penicillins)<sup>15,16,17,19,20<sup>15,16</sup></sup> to prevent extension of infection into surrounding soft tissue planes<sup>6</sup>.





Image 4 – Periapical radiolucency<sup>8</sup>

A **periodontal abscess** is when infection enters via the gingival tissues adjacent to the tooth. These are uncommon in children.

Image 5 - Dental Abscess<sup>9</sup>

**Management** involves drainage of the acute lesion – which can be achieved through a simple incision over the fluctuant area under local anaesthetic routinely performed at the patient's local dentist. Antibiotics (see **Appendix 2: Antibiotic Recommendations** (patients with normal renal function and no hypersensitivity to penicillins)<sup>15,16,17,19,20,15,16</sup>) are indicated only if there are systemic symptoms of fever or significant swelling. Patients should be referred for dental review within 5-7 days for definitive management<sup>9</sup>.

**Pericoronitis** refers to inflammation/infection of the gingival tissue overlying the crown of an impacted tooth (typically the 3<sup>rd</sup> molar/wisdom tooth). Pain can be severe with chewing and moving the jaw. Infection generally originates from food debris accumulating beneath the flap of gum covering the tooth<sup>10</sup>. These are more common in older teenagers.

**Management** involves use of appropriate analgesia, and irrigation beneath the inflamed tissue (operculum) with 0.9% saline (use of local anaesthesia around the surrounding gum may be required before irrigation). Patients should use an antiseptic mouthwash e.g. 2mg/mL chlorohexidine mouthwash pending dental review. Semi-urgent (1-2 weeks) dental review for operculectomy +/- extraction of the underlying tooth is required. If there are systemic symptoms of fever or significant local swelling, oral antibiotics should be commenced pending dental extraction to prevent extension of infection (See **Appendix 2: Antibiotic Recommendations** (patients with normal renal function and no hypersensitivity to penicillins)<sup>15,16,17,19,20 15,16</sup>). Routine imaging in ED is not necessary unless there is suspicion of other pathologies, i.e. fracture or periapical abscess or large intra-oral or extra-oral swelling requiring inpatient management<sup>10</sup>.

Progression of dental infections can lead to a localised abscess or cellulitis with spread to the soft tissues of the face or neck. The most common presentation of dental infection in children is the vestibular swelling (see image) which can be managed in an outpatient dental setting if age and cooperation allow.

Image 6- Vestibular swelling <sup>11</sup>

Dependent on the tooth involved, infection can spread to the buccal space (both maxillary and mandibular teeth), the canine space and upwards to the infra-orbital region (maxillary teeth), and the submandibular, sublingual, submental or masticator spaces (mandibular teeth). Cellulitis or abscess formation of *bilateral* submental, sublingual and submandibular spaces is termed Ludwig's Angina and requires urgent and aggressive treatment due to potential airway compromise. Rarely, infections of maxillary teeth which spread superiorly can lead to intra-cranial abscess formation or venous sinus thrombosis.

**Facial cellulitis.** Severe cellulitis involving floor of the mouth can be termed Ludwig's angina. From mandibular teeth, infection primarily spreads to the masticator space, then secondarily to the parotid and pharyngeal spaces. It can also spread directly to the sublingual and submandibular spaces (see Image 6 below). From maxillary teeth, the infection can spread to the buccal space, and upwards to the infra-orbital region<sup>13</sup>.

Image 6 – Spread of Odontogenic Infections<sup>12</sup>

A – Sublingual, B – Submandibular, C – Cervical, D – Palate, E – Infraorbital, F – Buccal.

**Facial Cellulitis** requires aggressive early treatment to prevent further complications. Infections of the Sublingual, Submental and Submandibular spaces can cause airway compromise<sup>12</sup>. Infections which spread

superiorly can lead to intra-cranial abscess formation or venous sinus thrombosis if not aggressively managed.

**Management** involves early administration of IV antibiotics (**See Appendix 2: Antibiotic Recommendations**) (patients with normal renal function and no hypersensitivity to penicillins)<sup>15,16,17,19,20</sup> Appendix 2: Antibiotic Recommendations (patients with normal renal function and no hypersensitivity to penicillins)<sup>15,16,17,19,20</sup>), and early senior assessment to identify complications.

- Urgent Anaesthetic/ENT/Maxillofacial review should be sought if there is any of:
  - Stridor
  - Altered voice
  - Hypoxia, respiratory distress.
- Hospital admission following discussion with the Maxillofacial Team for ongoing antibiotics +/- urgent surgical drainage/tooth extraction is necessary if there are any of:
  - Systemic symptoms of sepsis – fever, tachycardia, vomiting
  - Trismus (<2cm inter-incisor distance)
  - Immunocompromise / complex medical needs.
- Imaging should be targeted towards localising the source of infection, defining the extent of infective spread, and identifying/excluding complications (abscess formation, osteomyelitis, airway threat).
- Blood cultures should be collected if the patient is febrile or septic, and any purulent exudate should be swabbed prior to antibiotic administration.
- All patients should be kept Nil By Mouth until surgical review.

Patients may present to ED with pain or bleeding post dental extraction.

**Post Extraction Pain** is normal and expected following dental extraction, and usually peaks on the second or third day. It should be managed with regular simple analgesia (paracetamol + ibuprofen), with opiates used only for severe pain.

**Post Extraction Bleeding** is also common especially with patients on anticoagulants / bleeding diatheses. Management recommendations follow (attempt the next step if bleeding persists)<sup>19</sup>–

- 1) Applying pressure by placing a saline soaked gauze, rolled up tightly, in the socket and asking the patient to bite down. Pressure should be applied for 20 minutes.
- 2) Pack Surgicel into the bleeding socket, placing a gauze over the wound and asking the patient to bite down hard for 30 mins.
- 3) As above with Surgicel or gauze soaked in tranexamic acid (up to 25mg/kg of 100mg/mL solution) (Tranexamic acid can also be administered orally or intravenously depending on the severity).
- 4) Lignocaine with adrenaline can be injected to vasoconstrict and anaesthetise the area thus allowing the patient to bite down hard without pain.

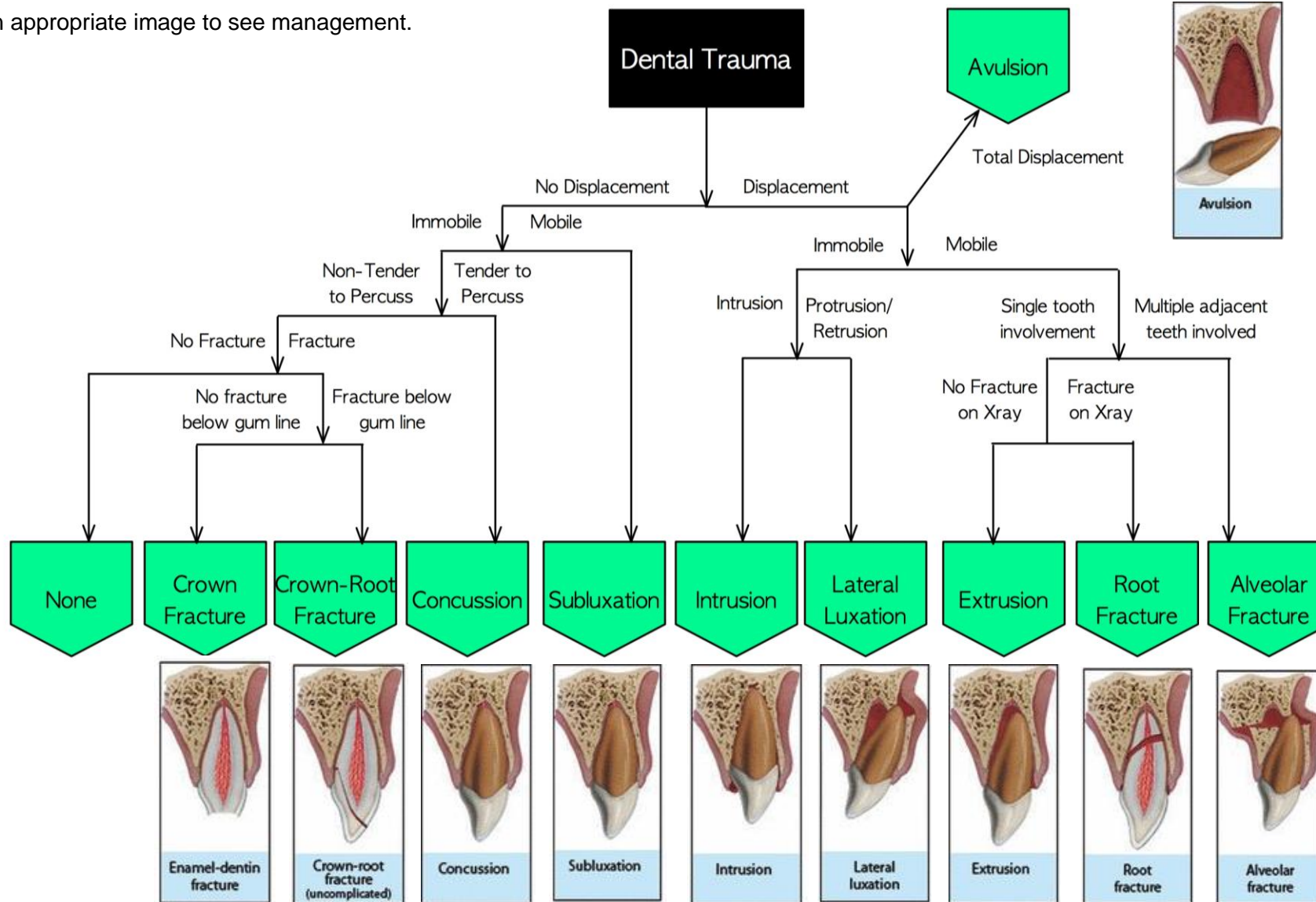
**Alveolar Osteitis** (Dry socket) occurs due to premature disintegration of the blood clot within the extraction socket<sup>12</sup>. Typically a severe throbbing pain presents several days after tooth extraction, and clinically the socket will be empty with no clot or granulation tissue present, with alveolar bone potentially visible<sup>13</sup>. Dry socket is rare in children.

**Management** in the ED involves provision of appropriate analgesia, irrigation of the socket with saline, and prompt dental review. If there are signs of infection (suppuration or swelling), clinicians can consider an OPG to identify retained tooth fragments, and commencement of oral antibiotics pending dental review within 24hrs (see [Appendix 2: Antibiotic Recommendations](#) (patients with normal renal function and no hypersensitivity to penicillins)<sup>15,16,17,19,20</sup>).



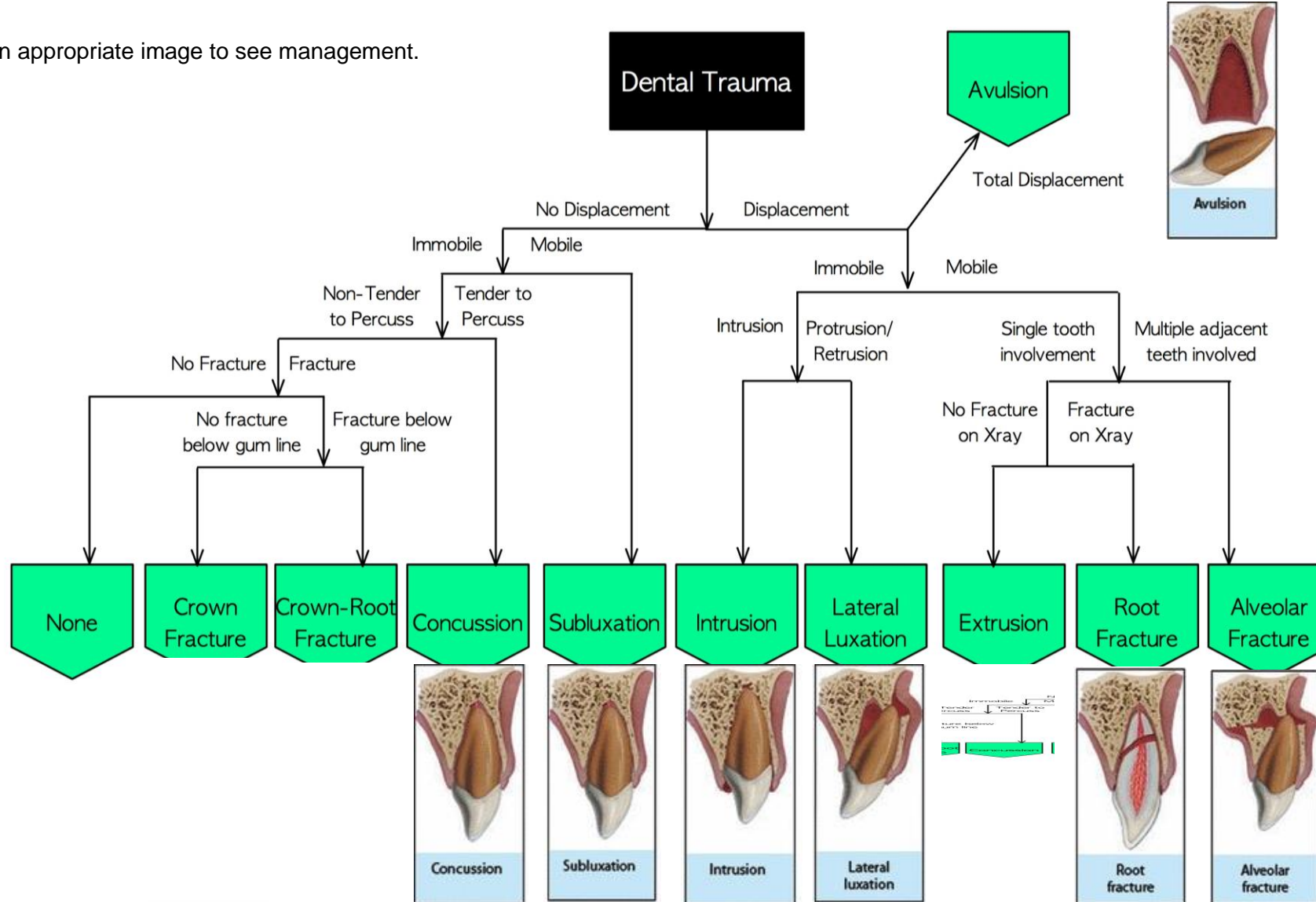
## Traumatic Conditions - Primary Teeth

Click on appropriate image to see management.



## Traumatic Conditions – Permanent Teeth



Click on appropriate image to see management.








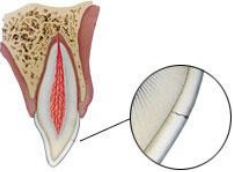
## Gingival Lacerations

If a large wound (>1cm) / grossly contaminated, discuss with Maxillofacial team regarding ongoing management. If small/simple, irrigate with saline or 0.2% chlorhexidine (local anaesthesia may be required for comfort) and leave to heal spontaneously.



## Primary Teeth Injuries (16)



Concussion	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Injury to supporting structures i.e. periodontal ligament.</p> <p>No increased mobility, no displacement, pain on percussion, no gingival bleeding.</p>	No imaging required.	No specific treatment needed in ED, simple analgesia as needed.	Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a> .
Subluxation	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Injury to supporting structures (without displacement) resulting in increased mobility and pain.</p> <p>Increased mobility, no displacement, pain on percussion, gingival bleeding acutely post injury, resolves spontaneously.</p>	No imaging required.	No specific treatment needed in ED, simple analgesia as needed.	Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a> .
Extrusive Luxation	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Partial displacement of the tooth out of its socket.</p> <p>Excessively loose or displaced tooth, possible protrusive or retractive</p>	No imaging required.	<p><b>minor extrusion &lt;3mm</b> in primary tooth:</p> <p>clean area with saline or chlorhexidine.</p>	Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a> .

	<p>orientation, alveolar socket bone intact, appears elongated, tender to percussion.</p>		<p>Reposition with finger OR Leave for spontaneous alignment. Local anaesthesia can be considered.</p> <p><b>&gt;3mm extrusion</b> – extraction necessary, discuss with MaxFacs team</p>	
<p><b>Lateral Luxation</b></p>	<p><b>Clinical Findings</b></p>	<p><b>Imaging</b></p>	<p><b>Treatment</b></p>	<p><b>Follow Up</b></p>
 <p><b>RETRUSION</b></p>  <p><b>PROTRUSION</b></p>	<p>Displacement of tooth other than axially (usually in palatal/lingual or labial direction). Accompanied by comminution or fracture of either the labial or the palatal/lingual alveolar bone. If both sides of alveolar socket are # - treat as an alveolar # (rarely affects a single tooth). Usually non-mobile (apex of tooth is forced into the bone by displacement).</p>	<p>No imaging required.</p>	<p><b>RETRUSION</b> – spontaneous repositioning</p> <p>clean area with saline or chlorhexidine.</p> <p><b>PROTRUSION</b> - extraction necessary due to pressure placed on permanent tooth by displaced primary tooth.</p> <p>clean area with saline or chlorhexidine.</p> <p>discuss with MaxFacs team re timing of extraction.</p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet.</a></p>


Intrusive Luxation	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Displacement of tooth axially into alveolar bone. May have comminution or fracture of alveolar socket</p> <p>Tooth can be impinging upon permanent tooth if apex is not displaced labially.</p> <p>Tooth may disappear completely in the tissues resembling avulsion and root fracture with complete extrusion of the coronal fragment.</p> <p>Tooth non- mobile.</p>	<p>Consider facial XR/OPG if intruded tooth not able to be seen or accounted.</p>	<p>No specific treatment needed in ED, simple analgesia as needed.</p> <p>May require subsequent removal by dentist if impinging on secondary tooth.</p> <p>Clean area with saline or chlorhexidine</p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>
Avulsion	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Tooth completely displaced out of socket. CONSIDER – is all avulsed tooth accounted for?</p> <p>Consider potential for aspiration if avulsed tooth not found.</p>	<p>Consider XR to rule out intrusion or root fracture if unable to account for whole tooth.</p> <p>If possible aspiration chest x-ray may be required</p>	<p>No specific treatment needed in ED, simple analgesia as needed.</p> <p>Clean area with saline or chlorhexidine.</p> <p><b>NOT RECOMMENDED TO REPLANT PRIMARY TEETH</b></p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>
Infraction	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Incomplete crack of the enamel without loss of tooth structure. Visible fracture line on surface of tooth. Not tender to percussion (if tender, consider possible luxation injury or root fracture).</p>	<p>No imaging required.</p>	<p>No specific treatment needed in ED, simple analgesia as needed.</p> <p>Clean area with saline or chlorhexidine.</p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>








Crown Fracture	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Fracture confined to the exposed tooth with loss of tooth structure.</p> <p>Visual loss of enamel, darker discolouration suggested dentin exposure, bleeding signifies pulp involvement.</p> <p>If tender to percussion, consider possible luxation injury or root fracture.</p> <p>Normal mobility.</p>	<p>No imaging recommended.</p> <p>Consider possibility of lodged tooth fragment if laceration in cheek/lip.</p>	<p>No specific treatment needed in ED, simple analgesia as needed.</p> <p>Clean area with saline or chlorhexidine.</p> <p>Primary tooth fragments should never be bonded back into place (only appropriate for a small subset of permanent tooth fractures).</p>	<p>Dental review as soon as possible.</p> <p>Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>
Crown/Root Fracture	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Fracture involving the enamel, dentin and cementum with loss of tooth structure.</p> <p>Crown fracture extends below gingival margin. Crown is split into 2 or more fragments, 1 of which is mobile.</p> <p>Tender to percussion.</p> <p>Fracture line may or may not pass through pulp.</p>	<p>No imaging in ED.</p> <p>Consider possibility of lodged tooth fragment if laceration in cheek/lip.</p>	<p>If fragment very loose/aspiration risk, or if pulp on view – should be discussed with Maxfac.</p>	<p>Dental review as soon as possible.</p> <p>Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>
Root Fracture	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Fracture confined to the root of the tooth involving cementum, dentin and pulp.</p> <p>Coronal segment is usually mobile and may be displaced.</p>	<p>No imaging in ED.</p> <p>Consider possibility of lodged tooth fragment if laceration in cheek/lip.</p>	<p>If the coronal fragment is not displaced/loose – no treatment is required in ED. Simple analgesia as needed.</p> <p>If the coronal fragment is loose,</p>	<p>Dental review as soon as possible.</p> <p>Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>



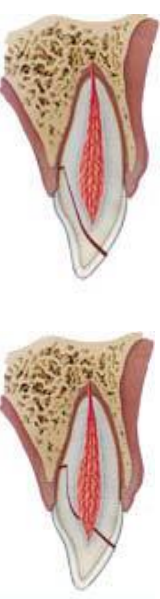
	Transient crown discoloration (red/grey) may occur.		remove if able, or splinting can be attempted if unable to remove (i.e duoderm onto dry teeth, including tooth on either side).  See <a href="#">Appendix 4 – Dental Splinting</a>	
<b>Alveolar Fracture</b>	<b>Clinical Findings</b>	<b>Imaging</b>	<b>Treatment</b>	<b>Follow Up</b>
	A fracture of the alveolar bone socket. Characterised by mobility of alveolar process. <b>Typically, several teeth will often move as a unit.</b> Occlusal interference often present. Tenderness to percussion.	Imaging may be required to define extent and nature of underlying alveolar fractures.  Discuss with Maxfac's for advice re imaging.	As per Maxfac's advice.	Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet.</a>

## Permanent Teeth Injuries (16)



<b>Concussion</b>	<b>Clinical Findings</b>	<b>Imaging</b>	<b>Treatment</b>	<b>Follow Up</b>
	injury to supporting structures i.e. periodontal ligament.  no increased mobility, no displacement, pain on percussion, no gingival bleeding. No interference with bite.	No imaging in ED.	No specific treatment needed in ED. Simple analgesia as needed.	Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet.</a>

<b>Subluxation</b>	<b>Clinical Findings</b>	<b>Imaging</b>	<b>Treatment</b>	<b>Follow Up</b>
	<p>injury to supporting structures (without displacement)</p> <p>increased mobility, no displacement, pain on percussion gingival bleeding acutely post injury.</p>	No imaging in ED.	No specific treatment needed in ED. Simple analgesia as needed.	Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet.</a>
<b>Extrusive Luxation</b>	<b>Clinical Findings</b>	<b>Imaging</b>	<b>Treatment</b>	<b>Follow Up</b>
	<p>Partial displacement of the tooth out of its socket</p> <p>Excessively loose or displaced tooth,</p> <p>Alveolar socket bone intact</p> <p>Appears elongated</p> <p>Tender to percussion.</p>	No imaging in ED.	<p>Clean area with saline or chlorhexidine</p> <p>Reposition the tooth by gently re-inserting it into the tooth socket with axial digital pressure. Local Anaesthetic can be considered.</p> <p>Stabilise the tooth using a flexible splint such as DuoDERM, or other options as discussed with local Maxfac/dentist.</p> <p>See <a href="#">Appendix 4 – Dental Splinting</a></p>	Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet.</a>
<b>Lateral Luxation</b>	<b>Clinical Findings</b>	<b>Imaging</b>	<b>Treatment</b>	<b>Follow Up</b>
	<p>Displacement of tooth other than axially (usually in palatal/lingual or labial direction)</p> <p>Usually non-mobile (apex of tooth is forced into the bone by displacement).</p>	No imaging in ED.	<p>Clean area with saline. Using local anaesthesia, reposition the tooth by gently re-inserting it into the tooth socket with axial digital pressure.</p> <p>Stabilise the tooth using a flexible splint such as DuoDERM, or other options as discussed with local Maxfac/dentist.</p>	Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet.</a>

			See <a href="#">Appendix 4 – Dental Splinting</a>	
<b>Intrusive Luxation</b>	<b>Clinical Findings</b>	<b>Imaging</b>	<b>Treatment</b>	<b>Follow Up</b>
	<p>Displacement of tooth into alveolar bone, accompanied by comminution or fracture of alveolar socket. Tooth is displaced axially into alveolar bone, and is immobile.</p>	<p>No imaging needed in ED.</p>	<p>No specific treatment needed in ED, simple analgesia as needed.</p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>
<b>Avulsion</b>	<b>Clinical Findings</b>	<b>Imaging</b>	<b>Treatment</b>	<b>Follow Up</b>
	<p>Tooth completely displaced out of socket.</p> <p><b>DO NOT REPLANT PRIMARY TEETH.</b></p>	<p>No imaging in ED.</p> <p>Consider possibility of lodged tooth fragment if laceration in cheek/lip.</p>	<p>Handle tooth via crown, irrigate thoroughly with saline, avoid touching root surface. Gently irrigate socket with saline</p> <p>Wherever possible, immediately replant the tooth into the socket with gentle digital pressure using local anaesthesia if necessary, and splint with a flexible splint,</p> <p>Commence PO Antibiotics (see appendix)</p> <p>Consider Tetanus status.</p> <p>See <a href="#">Appendix 4 – Dental Splinting</a></p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p> <p>If unable to reimplant, avulsed tooth should be gently irrigated and kept in a sterile container in skim milk. (if not available, any milk or saline). <b>DO NOT</b> store or irrigate in water.</p>
<b>Infraction</b>	<b>Clinical Findings</b>	<b>Imaging</b>	<b>Treatment</b>	<b>Follow Up</b>
	<p>Incomplete crack of the enamel without loss of tooth structure. Visible fracture line on surface of tooth.</p>	<p>No imaging in ED.</p>	<p>No specific treatment needed in ED, simple analgesia as needed.</p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental</a></p>

	<p>Not tender to percussion (if tender, consider possible luxation injury or root fracture).</p>			<p><a href="#">Injury Advice Sheet.</a></p>
<p><b>Enamel +/- Dentin +/- Pulp Fracture</b></p>	<p><b>Clinical Findings</b></p>	<p><b>Imaging</b></p>	<p><b>Treatment</b></p>	<p><b>Follow Up</b></p>
	<p>Fracture confined to the exposed tooth with loss of tooth structure. Visual loss of enamel, darker discolouration suggested dentin exposure, bleeding signifies pulp involvement. If tender to percussion, consider possible luxation injury or root fracture. Normal mobility.</p>	<p>No imaging in ED. Consider possibility of lodged tooth fragment if laceration in cheek/lip.</p>	<p>If tooth fragment is available, should be gently irrigated and kept in a sterile container in skim milk. (if not available, any milk or saline). DO NOT store or irrigate in water.</p> <p>Cover exposed tooth with duoderm CGF or similar.</p> <p>See <a href="#">Appendix 4 – Dental Splinting</a></p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet.</a></p>
<p><b>Crown-Root Fracture</b></p>	<p><b>Clinical Findings</b></p>	<p><b>Imaging</b></p>	<p><b>Treatment</b></p>	<p><b>Follow Up</b></p>
	<p>Fracture involving the enamel, dentin and cementum with loss of tooth structure <b>with/without</b> exposing the pulp.</p> <p>Crown fracture extends below gingival margin.</p> <p>Crown is split into 2 or more fragments, 1 of which is mobile.</p> <p>Tender to percussion.</p>	<p>No imaging in ED. Radiograph of lip or cheek lacerations to search for tooth fragments or foreign material.</p>	<p>If tooth fragment is available, should be gently irrigated and kept in a sterile container in skim milk. (if not available, any milk or saline). DO NOT store or irrigate in water.</p> <p>Discuss all cases with Dental. Discussion with Maxfac's warranted if associated with lacerations/concerns for foreign bodies in soft tissues</p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet.</a></p>



Root Fracture	Clinical Findings	Imaging	Treatment	Follow Up
	<p>Fracture confined to the root of the tooth involving cementum, dentin and pulp.</p> <p>Coronal segment is usually mobile and may be displaced. Transient crown discoloration (red/grey) may occur.</p>	<p>No imaging in ED.</p> <p>Radiograph of lip or cheek lacerations to search for tooth fragments or foreign material.</p>	<p>If coronal segment avulsed from socket, irrigate thoroughly with saline, avoid touching exposed surface.</p> <p>Irrigate tooth socket with saline</p> <p>If possible, immediately replant the tooth into the socket with gentle digital pressure, using local anaesthesia if necessary, and splint with duoderm CGF or similar.</p> <p>Discuss all cases with Maxfac.</p> <p>See <a href="#">Appendix 4 – Dental Splinting</a></p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>
Alveolar Fracture	Clinical Findings	Imaging	Treatment	Follow Up
	<p>A fracture of the alveolar process which may or may not involve the alveolar bone socket. Characterised by mobility of alveolar process, typically several teeth will move as a unit. Tenderness to percussion.</p>	<p>Imaging may be required to define extent and nature of underlying alveolar fractures.</p> <p>Discuss with Maxfac for advice re imaging.</p>	<p>Discuss all with Maxfac.</p>	<p>Dental review as soon as possible. Interim care as per <a href="#">Appendix 3: Dental Injury Advice Sheet</a>.</p>

## Consultation

Key stakeholders who reviewed this version:

- ED SMO, QCH
- Dental services QCH
- Maxillofacial services QCH
- AMS Pharmacist QCH
- ID physician, QCH

## Definition of terms

Term	Definition
ED	Emergency Department

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#### Guideline revision and approval history

Version No.	Modified by	Amendments authorised by	Approved by
1.0	Director Paediatric Emergency Department	Divisional Director, Critical care	Executive Director Clinical Services
2.0 01/02/2024	Director Paediatric Emergency Department	Divisional Director, Critical care	Executive Director Clinical Services

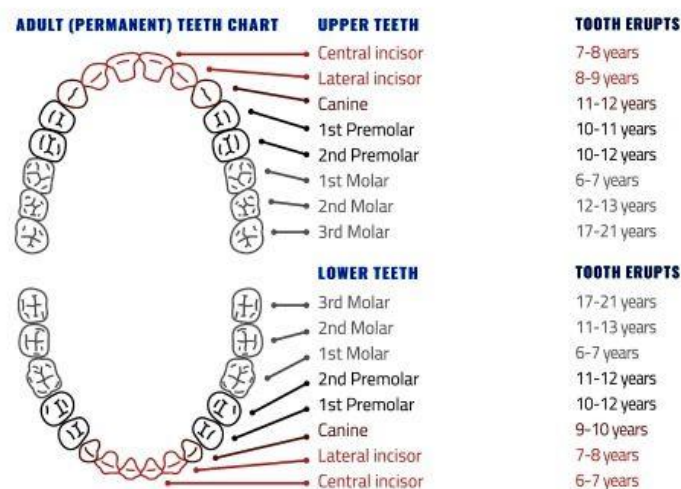
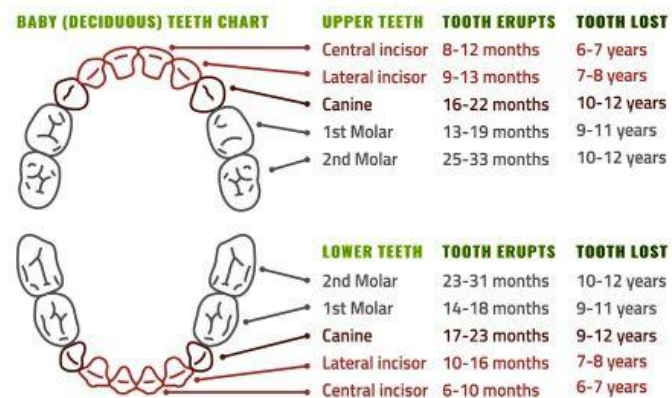
<b>Keywords</b>	Dental, tooth, trauma, infection, 00758
<b>Accreditation references</b>	NSQHS Standards (1-8): 1, 3, 4

## Appendix 1: Dental Nomenclature

Permanent Teeth															
Upper Right							Upper Left								
18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
Lower Right							Lower Left								

Primary teeth									
Upper Right					Upper Left				
55	54	53	52	51	61	62	63	64	65
85	84	83	82	81	71	72	73	74	75
Lower Right					Lower Left				

### Dental Nomenclature (16)



### Dental Eruption Chronology<sup>18</sup>

## Appendix 2: Antibiotic Recommendations (patients with normal renal function and no hypersensitivity to penicillins)<sup>15,16,17,19,20</sup>

Condition	Recommended Antibiotic	Duration	Comments
<b>Periapical Abscess</b>	Metronidazole 10mg/kg orally (max 400mg) every 12 hours.  Amoxicillin 30 mg/kg orally (maximum 1000 mg) every 8 hours	Until dental review (24-48hrs)	** only if dental review not possible within 24hrs and <b>signs of systemic infection</b>
<b>Periodontal Abscess and Pericoronitis</b>	Metronidazole 10mg/kg orally (max 400mg) every 12 hours.  Amoxicillin 30 mg/kg orally (maximum 1000 mg) every 8 hours	Until dental review (5-7 days)	** only if associated with fevers and significant swelling
<b>Facial Cellulitis (of Dental Origin)</b>	IV Amoxicillin/Clavulanic Acid Infants and children (greater than 3 months) Severe infection: 25 mg/kg/dose (amoxicillin component) every 6 hours (Maximum 1000 mg/dose Amoxicillin component)  Adolescents greater than 12 years (and greater than 40kg): Severe infection: 25 mg/kg/dose (amoxicillin component) every 6 hours (Maximum 2000 mg/dose Amoxicillin component)	Up to 48 hours – ID approval required if continuing for more than 48 hours.	Oral dosing may be considered in discussion with the admitting team.  Amoxicillin/Clavulanic acid orally 22.5 mg/kg (Maximum 875 mg/dose Amoxicillin component) twice daily for up to 7 days (total IV and oral antibiotics)
<b>Alveolar Osteitis</b>	Amoxicillin 30 mg/kg orally (maximum 1000 mg) every 8 hours	Up to 7 days or until dental review	**only if signs of systemic infection
<b>Avulsion</b>	Up to 8 years – Amoxicillin 30 mg/kg orally (maximum 1000 mg) every 8 hours for 7 days  Greater than 8 years – Doxycycline 2 mg/kg orally twice daily (max 100 mg/dose) for 7 days	7 days	**Antibiotics are recommended as they help reduce healing complications, such as inflammatory root resorption, which is associated with the presence of bacteria in the root canal system.



			<p>Tetracyclines are preferred in &gt; 8yo as they also have some direct antiresorptive activity.</p> <p>For doxycycline, patient to remain upright for 30 minutes post dose to reduce esophagitis.</p> <p>Counsel patient/family about sun safety (high incidence of photosensitivity with tetracyclines)</p>
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## Appendix 3: Dental Injury Advice Sheet



### Dental Injury Advice Sheet

#### **Diet**

Soft food for one week.

i.e. nothing that causes your child pain whilst eating.

#### **Dental Hygiene**

Brush teeth gently with a soft brush after every meal.

Apply chlorhexidine 0.1% (using a cotton tip) to the gum around the affect tooth/teeth twice a day for one week

#### **Pain Relief**

Tooth pain can be treated with paracetamol and ibuprofen as needed.

#### **Follow Up**

Please make an appointment to see your dentist within \_\_\_\_\_ .

If your child has severe pain, fevers, troubling opening their mouth, or you have other concerns, please seek prompt medical attention.

## Appendix 4: Dental Splinting

### Dental Splinting with DuoDerm

- Suggested first line splinting technique
- Success requires field to be AS DRY AS POSSIBLE prior to application

#### Instructions

1. Pre-measure and cut a piece of DuoDerm (or similar) to be wide enough to cover the anterior 2/3 (avoid contact with gum) of the affected tooth and wrap under to cover the posterior 2/3. It should be long enough to stick to the teeth on either side of the affected tooth.
2. Irrigate affected area to remove blood and debris.
3. Ensure teeth and area are as dry as possible prior to application of DuoDerm
  - a. Placed gauze square under lip above/below tooth to keep area dry, and wipe front and back surface of affected and adjacent teeth with gauze immediately prior to applications.
  - b. Consider using a tongue depressor to keep the tongue away from the area during application.
  - c. Using active suction and oxygen via directed tubing can help keep the area dry.
4. Apply DuoDerm to anterior surfaces first, then wrap under.
5. This technique will provide immobilisation up to 24hrs to allow patients to see their dentist.



### Alternate Splinting approaches

Alternate splinting techniques may be employed if DuoDerm is not available / successful, according to local practices, expertise and equipment availability.