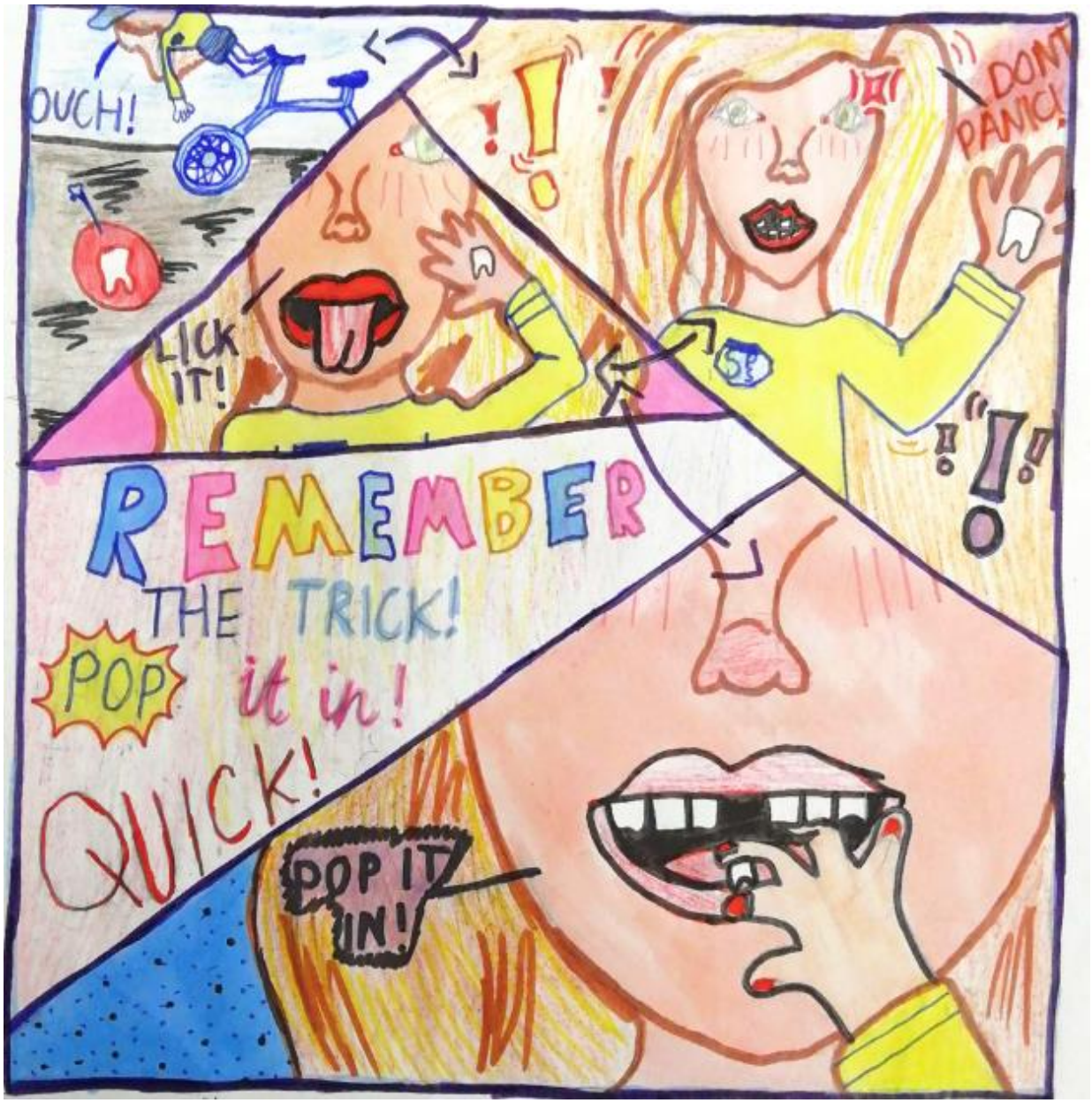
Dental Trauma

Practitioner's Guide for Patients under 16 years



Contents

Introduction to managing trauma

This guide has been produced to support dentists in managing dental trauma and improving outcomes for patients. At the end of the Toolkit are three quick reference flow charts, to guide first line decision making in situations where time is of the essence.

Using published estimates, we can expect every dental practice in the UK to see around one case of child dental trauma per year.
Because of this relatively rare occurrence, managing dental trauma can sometimes feel quite challenging.
The evidence shows that the key to achieving the best outcomes for patients is rapid access to the most appropriate treatment as soon as possible after the injury. This is why it is so important to get the first aid, initial treatment right. Correct diagnosis and follow-up may avoid the loss of a tooth, which in children would have significant emotional and financial impact over a life time.

Please raise awareness with your local schools, sports clubs and youth groups on how to manage an avulsed tooth! If the tooth is reimplanted at the scene of the injury, the chances of success are far greater.

Improving outcomes for trauma patients in Ayrshire & Arran

The overall aim is to ensure that:

- All clinicians in A&A have the confidence and knowledge to provide a timely and effective first line response to dental trauma.
- All clinicians are aware of the need for close monitoring of patients following trauma, and when to refer.
- All settings have the equipment described within the Trauma toolkit section of this booklet to support optimal treatment.
- Dental practitioners in A&A can attend training sessions in trauma
- All practitioners become familiar with the excellent 'Dental Trauma Guide' website for more detailed,comprehensive guidance on the diagnosis and management of dental trauma.
- Membership to the Dental Trauma Guide costs 25 USD/year but there are plenty of free resources on the internet to support practitioners most notably the charity Dental Trauma UK. Membership of Dental Trauma UK includes free access to the Dental Trauma Guide.

Key Trauma Facts

- Around 20-30% of the population are living with a dentition that may have suffered trauma.
- The incidence of dental trauma is estimated at between 1% and 3% of the population/year.
- High risk groups can be broadly split into ages 2-4, 10-12 and adolescents onwards.
- From ages 10-12 the risk largely comes from sports injuries and accidents.
- From adolescence through to early adulthood the risk largely comes in the form of alcohol related injury and road traffic accidents. These latter injuries usually occur at weekends when access to care may be restricted.
- Trauma is more common in males than females.

- The upper central incisors are the most commonly affected teeth followed by lower centrals then upper lateral incisors.
- Children with increased overjet (>6mm) are twice as likely to experience dental trauma
- Over 90% of such trauma is dento-alveolar alone but nearly a third will have a soft tissue component.
- Jaw fractures are comparatively rare, only present in around 6% of cases.

Managing Trauma: Getting Advice

For advice on managing dental trauma in adults, (16 yrs and over) please contact the adult dental trauma service at Glasgow Dental Hospital Restorative Department. The process is similar to the management of child trauma below in that they would request the practitioner first consult the Dental Trauma Guide.

Children under 16 attending with a dental trauma injury

We would encourage general dental practitioners to carry out immediate first aid of dental trauma, as soon as possible (at least within 24hrs of injury).

A dental advice line is available for practitioners who would like either advice prior to immediate management or after initial treatment of dental trauma, to support with patient follow-up. The procedure is as follows:

1. Take initial history, radiographs and make diagnosis
2. Consult this dental trauma manual and/or dental trauma website
3. The practitioner should proceed with immediate management. If however the practitioner wishes advice prior to proceeding, they should first ensure the guidance has been checked, and then:
   Telephone 01294 323301 **between the hours of 8.45am and 4.15pm Mon-Friday**
4. The administrative staff will record patient details, and diagnosis and arrange for a call back from the on-call trauma dentist.

There are some trauma diagnoses that do not require referral to specialist services. However, more complex trauma should be referred via the specialist referral pathway (on SCI gateway) after initial management. Please mark the referral “urgent” and call the above number or email dentalservices@aapct.scot.nhs.uk to ensure the team are alerted as soon as possible so timely follow-up can be arranged. The table overleaf explains which diagnoses require a referral to PDS following initial management, and which should be managed wholly within GDS.

When to refer to PDS paediatric specialist for follow-up?

Diagnosis		**Treatment and Follow-up with GDP**	**Emergency treatment with GDP *then* Follow-up with paeds specialist- refer via SCI gateway**
Primary			
Avulsion		X (unless significant soft tissue injury)	
Crown Fracture		X (Repair with GIC or composite)	
Crown Fracture & Pulp Exposed		X (Extract or refer directly to GA)	
Intrusion			x
Luxation injury that interferes with occlusion(extrusion or lateral luxation)		X (Extract or refer directly to GA)	
Luxation injury with no occlusal interference			x
	Permanent		
	Crown Fracture (Enamel and Enamel-Dentine)	x	
	Enamel-Dentine-Pulp Fracture		x
	Subluxation		X (unless no splint was required)
	All other trauma diagnosis (Avulsion, Luxation etc)		x

History taking

History
A confused or disorientated patient could be suggestive of systemic problems or underlying head injury. The safest option is such circumstances would be an acute referral to hospital care.
Where did the injury occur?
In addition the location may sometimes indicate the possibility of contamination of the tooth and inform the decision to seek tetanus prophylaxis. Is tetanus immunisation up to date?
How did the injury occur?
Estimation of the velocity of impact can anticipate injury severity.
When did the injury occur?
In relation to a tooth avulsion injury the length of time and the extra-oral storage condition becomes very important when planning immediate care and assessing the risk of future complications.
Are there signs of brain injury?
Loss of consciousness, amnesia, nausea and vomiting are all signs of brain damage and require medical attention. If there is a positive history of brain injury, refer to the local Accident and Emergency Department.
If teeth are broken or avulsed can all missing pieces be accounted for?
This is essential as fractured portions can be reattached. Fragments may be embedded in soft tissues and if fragments are unaccounted for this indicates the need for soft tissue radiographs.
Is there disruption of the occlusion?
Does the patient's bite feel right? If not this should alert the clinician to the possibility of a displacement injury or fracture. This will be confirmed during the examination. This is also aids decision making in management.
Medical history:
This should be rapid but thorough. There are very few medical or systemic factors that may affect acute trauma management in primary care. Questions should include the following factors that may contribute to underlying signs and symptoms:
1. Bleeding disorders or anticoagulant therapy (for increased risk of bruising), haematoma and intracranial bleed.
2. Tetanus status.
Even patients with very complex medical histories should be offered standard acute trauma care including reimplantation as the challenges presented with prosthetic rehabilitation may be more complex than the risks posed by immediate first line treatment.
Hobbies:
If the patient has a high risk of future trauma through sport they must be counselled on the importance of modifying behaviour until healing

For any suspicion of facial or jaw fractures, please contact the on-call max-facs team at Crosshouse.

Clinical Examination and Radiographs

Examination

Clean the patient and administer local anaesthetic where required.

Soft tissue Examination

Assess all lacerations. If there are significant extra-oral lacerations that require suturing with risk of scarring at a later date: clean the wound and refer to local acute facility for treatment with Max-Facs/Plastics.

Is there any disturbance in the bite?

This may indicate a luxation injury with displacement, an alveolar or jaw fracture or a fracture of the condylar region. Limited or deviation on opening may be consistent with condylar head fracture. Significant disturbances of occlusion or step deformities in the occlusal plane may be suggestive of mandibular fracture or dento-alveolar fracture. If suspected refer to Maxillofacial Services.

Sensibility testing?

Testing with Ethyl Chloride can be useful in predicting future outcomes. When patients present with multiple or severe injury this can be saved for review stages of treatment due to potential discomfort.

Radiographs:

Periapcial radiography with film holders should be taken at baseline. If alveolar fracture or root fracture is suspected a second view is sensible. Using a size 2 film to take an occlusal view is very useful in addition as this shows any fractures in different plane. This is usually easy to tolerate and a film-holder is not required.

Always take image of adjacent- non-injured tooth for comparison.

Key features to assess on radiographs include:

- Apical development
- Fracture lines of the root
- Fracture lines of the alveolus
- PDL alterations

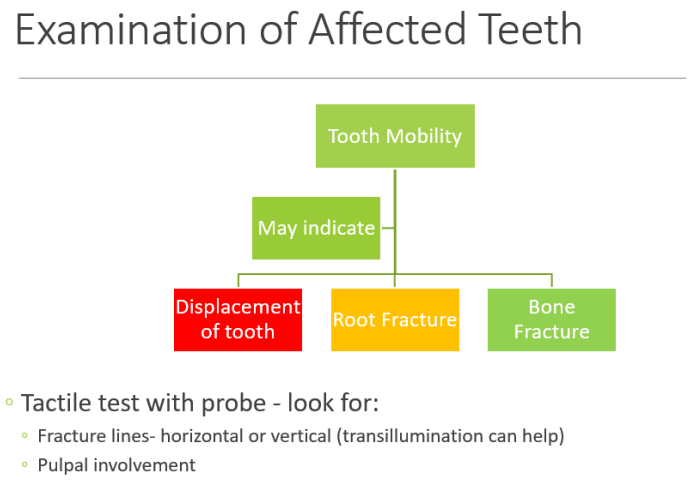
Missing teeth/fragments:

Are all fragments accounted for? If not take a radiograph of the lip. Place the film in the labial sulcus and reduce the exposure time to 1/5 of that for an anterior exposure. If fragments cannot be accounted for and there are symptoms of coughing or wheezing, the child should referred to emergency department for a chest radiograph.

Photographic Examination:

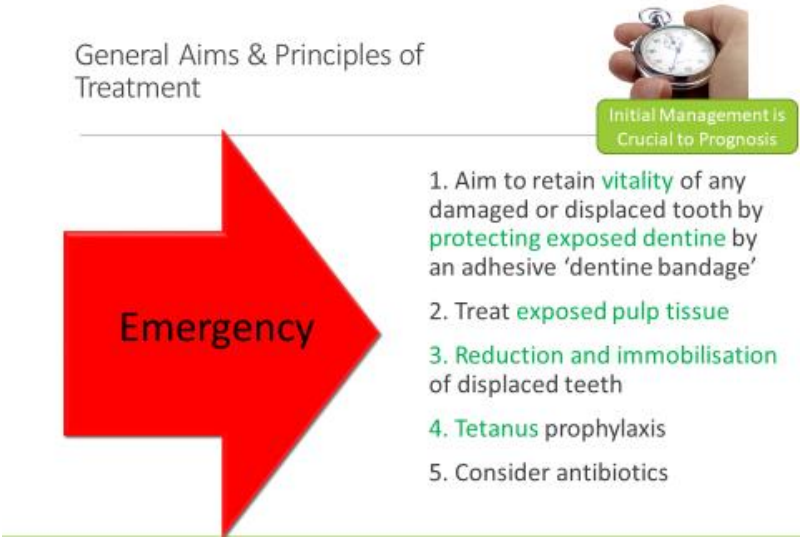
If available, this offers an exact documentation of the extent of injury and can be used later in treatment planning, legal claims or clinical research.

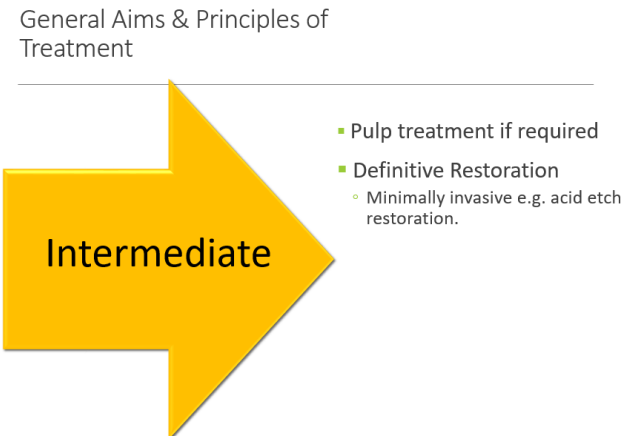
Note that patient consent is required.

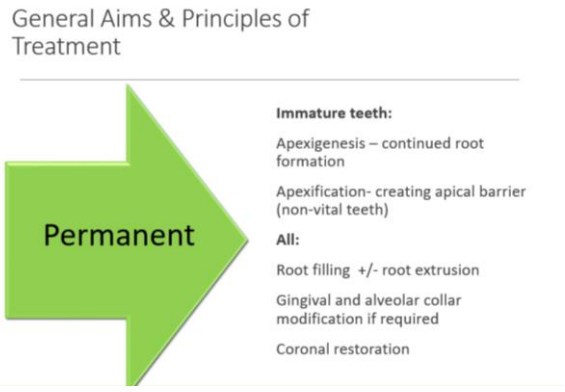


Aims of Treatment

Most people will have had such minimal trauma that after initial treatment, no further treatment is required, but for others the consequences could be more severe. Simple cases may include uncomplicated fractures of dentine and enamel. In more severe case this could mean discolouration of teeth, loss of vitality, resorption or loss of the tooth. Timely and appropriate management is critical if such negative outcomes are to be minimised.







Check the diagnosis:

Concussion An injury to the tooth-supporting structures *without* increased mobility or displacement of the tooth, but with pain to percussion.	
Subluxation • An injury to the tooth supporting structures resulting in increased mobility, but without displacement of the tooth. • Bleeding from the gingival sulcus confirms the diagnosis.	
Enamel Dentine Fracture A fracture confined to enamel and dentine with loss of tooth structure, but not involving the pulp	
Enamel dentine fracture including the root • A fracture involving enamel, dentine and cementum with loss of tooth structure. • May or may not include the pulp. • If this include the pulp the diagnosis should include the prefix “complex”.	
Complex enamel dentine fracture A fracture involving enamel and dentine with loss of tooth structure and exposure of the pulp.	
Extrusion • Partial displacement of the tooth out of its socket. • An injury to the tooth characterized by partial or total separation of the periodontal ligament resulting in loosening and displacement of the tooth. • The alveolar socket bone **is intact** in an extrusion injury as opposed to a lateral luxation injury. • In addition to axial displacement, the tooth will usually have an element of protrusion or retrusion. • In severe extrusion injuries the retrusion/protrusion element can be very pronounced. In some cases it can be more pronounced than the extrusive element.	
Root fracture • A fracture confined to the root of the tooth involving cementum, dentine, and the pulp. • Root fractures can be further classified by whether the coronal fragment is displaced. • Further information should include the location of the fracture as cervical, mid or apical third.	

Lateral luxation • Displacement of the tooth in any direction other than vertically. • Displacement is accompanied by comminution or fracture of either the labial or the palatal/lingual alveolar bone. • Characterized by partial or total separation of the periodontal ligament. • If both sides of the alveolar socket have been fractured, the injury should be classified as an alveolar fracture (alveolar fractures rarely affect only a single tooth). • In most cases of lateral luxation the apex of the tooth has been forced into the bone by the displacement, **and the tooth is frequently non-mobile.** • These can be tricky to reposition. Digital pressure should be applied in the buccal sulcus to the root apex and directed coronally (to "unlock" the tooth) before manipulating the tooth back into the socket.	
Intrusion • Displacement of the tooth into the alveolar bone. • This injury is accompanied by comminution or fracture of the alveolar socket. • Repositioning can be more challenging in severe injuries as the crown may not be accessible to locate or grasp. Forceps are invariably required. • **Immature teeth** intruded <u>less than 7mm</u> should be left to **spontaneously erupt.** • **Closed-apex teeth (**usually 10yrs+) intruded <u>less that 3mm</u> should be allowed **to spontaneously erupt.**	
Avulsion The tooth is completely displaced out of its socket. Clinically the socket is found empty or filled with a coagulum (blood clot).	
Alveolar fracture • A fracture of the alveolar process; may or may not involve the alveolar socket. • Teeth associated with alveolar fractures are characterised by mobility of the alveolar process; several teeth typically will move as a unit when mobility is checked. • Occlusal interference is often present.	

Primary Teeth Trauma

As a general rule, be conservative.
The child will be sore for up to 2 weeks and will require regular analgesics. Sleep is often disturbed in the first few days post-injury.
Soft diet is important, as is excellent oral hygiene. Usually the child will not tolerate brushing when the area is painful. Instruct parent on swabbing with cotton wool and chlorhexidine gluconate 0.2% mouthwash instead in the early days post-injury.

Primary teeth have an impressive ability to re-erupt/ re-position spontaneously, give standard parental instructions outlined above. If in doubt, call for advice.

Follow up on a monthly basis to ensure repositioning is occurring naturally. Give 3 months to at least see some movement in the right direction.
Extraction is advised in a lateral luxation injury where there is occlusal interference, or when mobility is excessive, or pulp is exposed.

Other than these, review and look for any signs of loss of vitality.

-

A knee to knee exam is important in examining a young child with trauma.
To update on this technique visit page 13 of SDCEP guidance, or:
https://www.smilesforlifeoralhealth.org/topic/knee-to-knee-oral-exam

Adverse effects on unerupted permanent teeth following trauma to the primary dentition

Whether the crown or the root of the adult tooth is affected, relates to its stage of development, and the type and severity of injury. Below 2 years of age the developing tooth germ is particularly sensitive to damage. Parents should be reassured that the likelihood of damage to the successor is minimal but normally very little can be done other that watch and wait.

Alterations to eruption patterns of the permanent successor: Anticipate the possibility of both delayed or premature eruption of the successor.

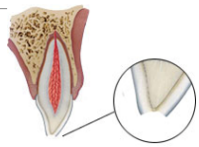
Enamel discolouration / hypoplasia: This is a common occurrence that may vary from a mild white / brown spot to a large pitted hypoplastic defect. It is likely if trauma occurs before the ages of 2-3 years. Treatment may involve a combination or bleaching, microabrasion or direct composite restorations. (Refer to specialist if this is identified in a permanent tooth)

Dilaceration (crown or root): Coronal dilaceration is likely if trauma occurs around 2 years of age and root dilacerations are more likely if trauma occurs between 2 and 5 years. Initial management of dilacerated crowns would be focussed upon minimally invasive whitening and resin based-approaches. Dilacerated roots may result in failure to erupt and these often have a guarded prognosis.

Permanent Teeth: Hard Tissue Fractures

How to manage an enamel fracture

Either : Bond fragment to tooth *or* Simply grind sharp edges



Take 2 periapical radiographs to rule out root fracture or luxation

Follow-up: 6-8wks and at 1 Year

Prognosis- 0% Risk of pulp necrosis

How to manage an enamel-dentine fracture

Account for fragment

Either- Bond fragment to tooth or Place composite "bandage"

Take 2 periapical radiographs to rule out root fracture or luxation

Radiograph any lip or cheek lacerations to rule out embedded fragment

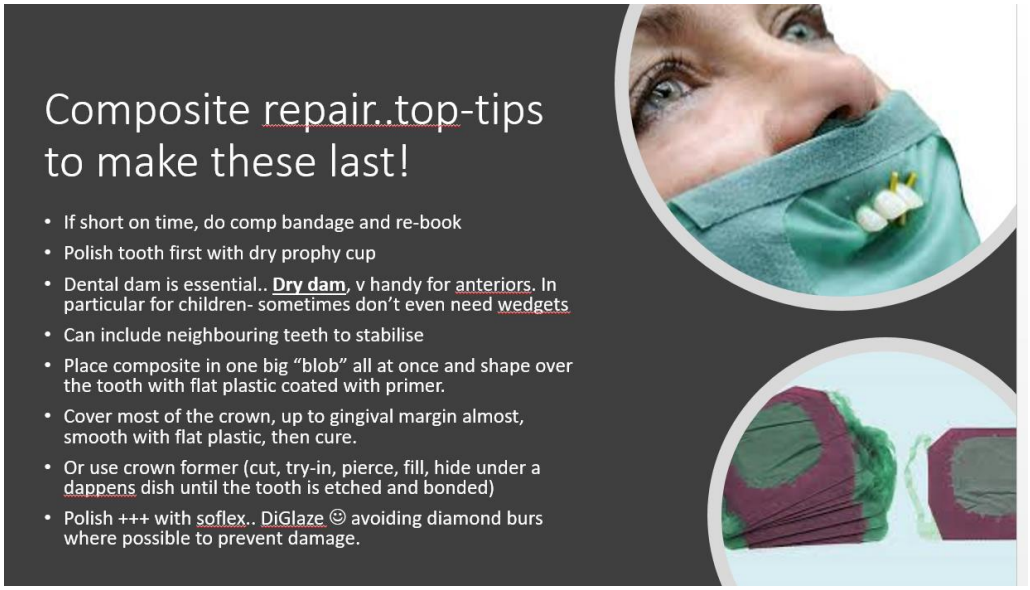
Sensibility testing and evaluate tooth maturity

Definitive Restoration

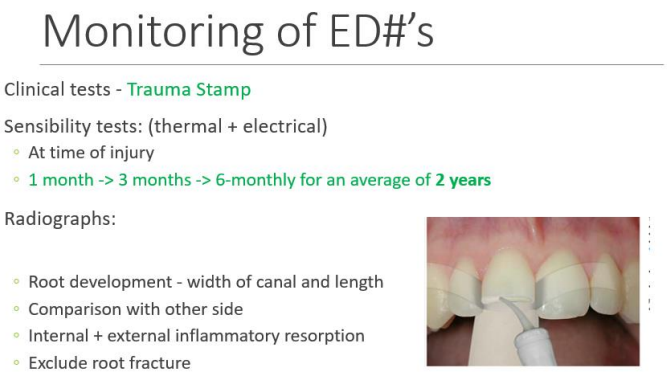
Follow-up: 6-8wks and at 1 Year

Line the restoration if the fracture is close to pulp

See animation on:
http://www.dentaltraumaguide.org/Permanent_enamel-dentin_fracture_Treatment.aspx



It takes less than a minute to apply dry-dam dental dam, no need for clamps. Reduction in moisture this avails pays dividends in terms of restoration longevity. Usually acceptable to children, if shown the dam before placement, and tucked away from nose as per picture above.

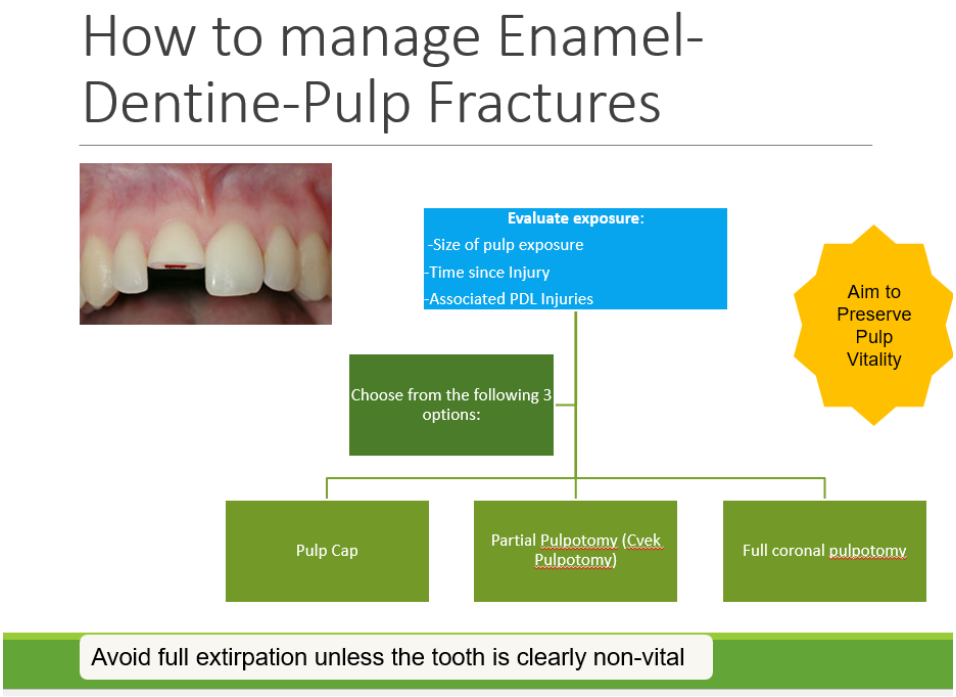


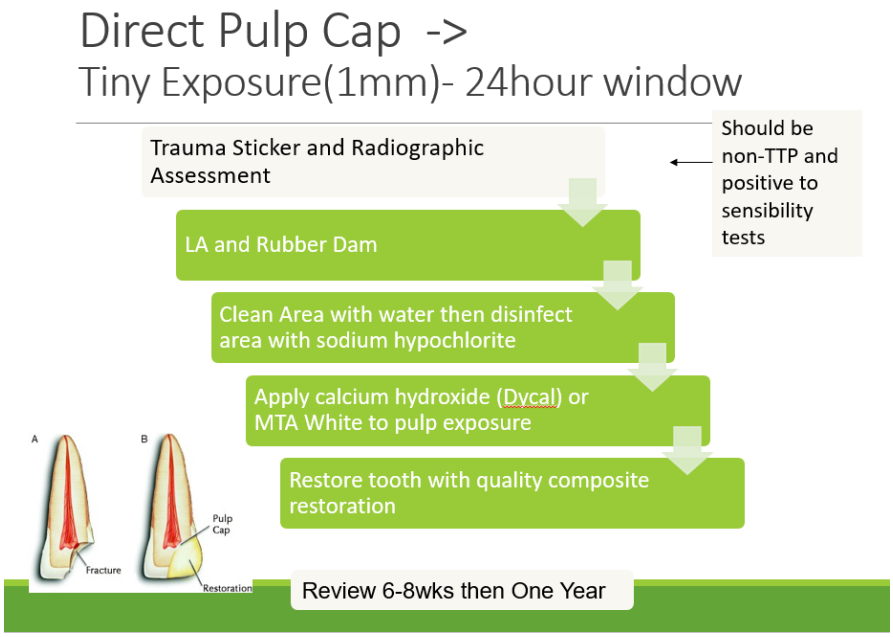
What if the enamel dental fractured tooth has a luxation injury too?

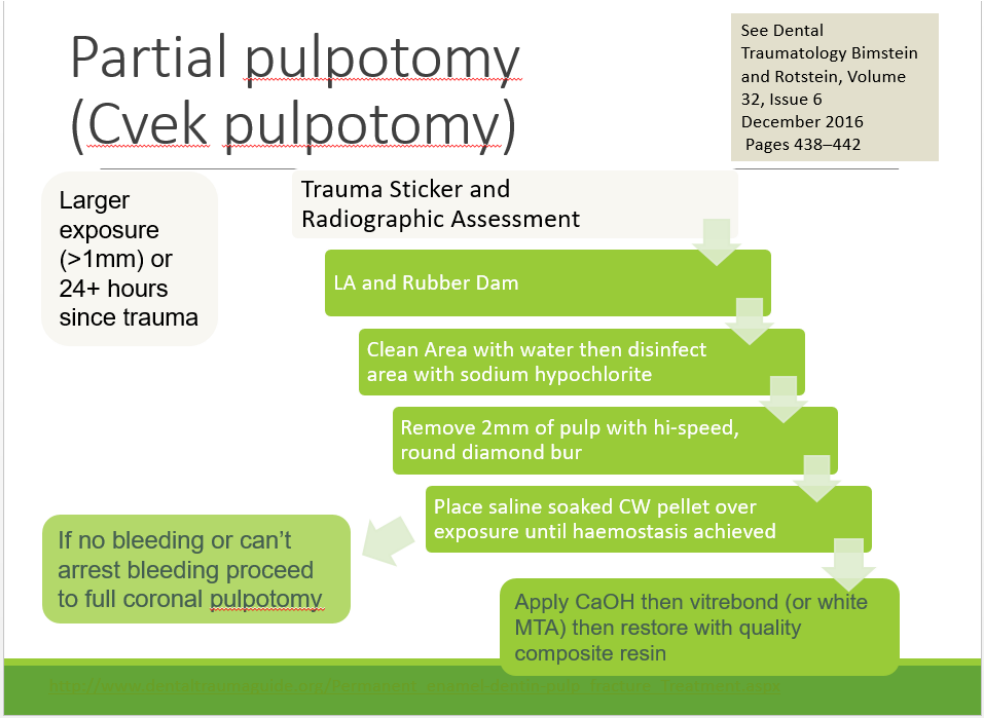
Associated Injury along with Enamel-Dentine fracture	Pulp Survival (%) Open Apex	Pulp Survival (%) Closed Apex
Concussion	95	85
Subluxation	80	50
Extrusion	60	20
Lateral Luxation	65	15
Intrusion	0	0

Enamel-Dentine-Pulp Fractures

In young patients with open apices, it is important to preserve pulp vitality by pulp capping or partial pulpotomy in order to secure further root development. This treatment is also the treatment of choice in patients with closed apices. Pulp extirpation is almost never the first-line of treatment when an EDP# occurs.
Calcium hydroxide (setting or non-setting depending on size of exposure) and Biodentine/MTA (white) are suitable materials for such procedures.



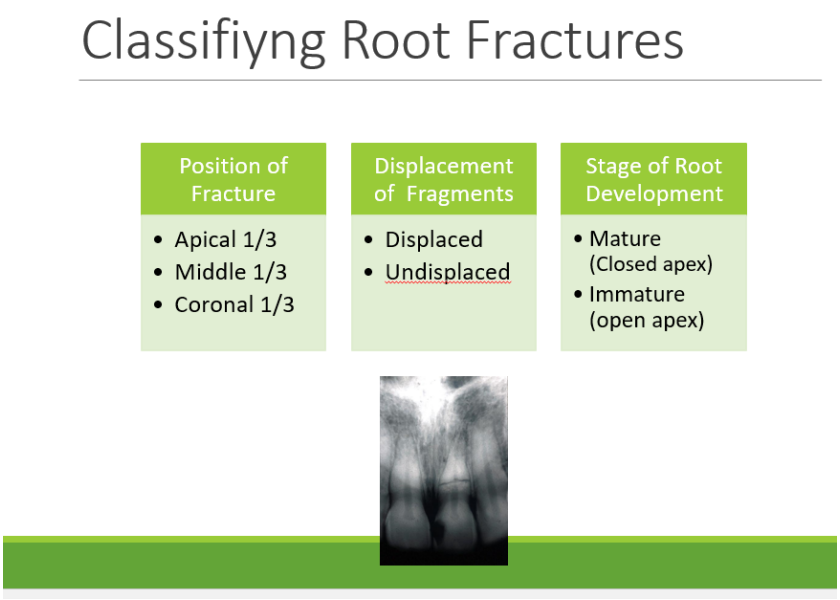




Full coronal pulpotomy- same procedure as above but instead of just 2mm, remove all pulp from pulp chamber with large diamond or large round slow-speed bur down to cervical constriction. Then place non-setting- Calcium Hydoxide and restore as above.

Hard-Tissue Fractures: Root Fractures

Two radiographic images, at different angles, are required to identify a root fracture. Eg 2 periapicals at eccentric angles. A root fractured tooth may be mobile, or may just be tender to percussion. Often, vitality is retained. Generally speaking, prognosis is improved the more apical the fracture line.



A splint should be placed if the tooth is mobile. The coronal fragment may first require gentle repositioning under LA if displacement is obvious.

- Use fingers to reposition using a watch winding motion with pressure in an apical direction under local anaesthesia.
- Splint the fragment in position using a roll of composite on the incisal edges
- Take a radiograph to confirm accurate repositioning
- If repositioning of the coronal fragment is accurate, the temporary splint should be left in situ whilst the tooth is splinted to the adjacent teeth.

How to treat a root fracture

Apical or Middle Third Fracture *If displaced*

Clean area with water/saline/chlorhexidine

Reposition tooth with digital pressure

Splint : **flexible splint for 4 weeks**

Review: 6-8wks, 6mths, 1yr and 5 yrs with radiographs

LA not always required

Coronal 1/3 Fractures require splinting for 4months with flexible splint

Soft Diet for 1 week & Good OH

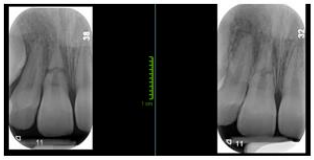
Outcomes

Healing Outcomes

Calcified tissue union across fracture line

Connective tissue

Calcified + connective tissue



Non-Healing Outcomes

Granulation tissue (usually associated with loss of vitality)

Splinting

Hinckfuss S, Messer LB. Splinting duration and periodontal outcomes for replanted avulsed teeth, a systematic review. *Dent Traumatol 2009; 25(2):150-7.*

Flexible 2 weeks
Subluxation Extrusion
Avulsion – open and closed apex <60 mins EAODT

Flexible 4 weeks
Luxation Apical/middle 1/3 root #
Intrusion
Avulsion – open and closed apex > 60 mins EADT

Exceptions
Flexible < 4 months -Coronal 1/3 root #

Rigid 4 weeks - Dento-alveolar fractures

What is a flexible splint?
Flexible: One tooth on either side of injured tooth(or teeth)
Rigid: Two teeth on either side of injured tooth (or teeth)

2020 guidelines- use 0.4mm wire (0.016") (SS or Nylon) and make sure the wire is passive, not active (this means, don't overbend the wire which could then act as an orthodontic appliance)

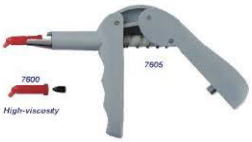
Placing a splint:
How-to Video: vimeo.com/137957560

Top tips-
Roll up balls of composite and have them (hidden from light) ready to place on teeth once etched and bonded and the wire cut and ready to use
*Bond the supporting teeth first, once these have been light-cured then cure the traumatised tooth *

Trauma Toolkit- an essential!

Trauma Kits

It is advisable to have a trauma kit made up in practice, in a plastic lidded storage container. This can be accessed quickly at the time of trauma, to save searching at a crucial moment for required pieces of kit.



Get the Gear..

- Consider making up a “trauma kit”
- Plastic lidded box:
- Composite
- Etch &Bond (self-etching primer?)
- Ortho Wire – new guidance 0.4mm (0.016”) SS or nylon
- Mauns cutters
- Adams pliers

Periodontal Ligament Injuries

Survival data is shown below, and can be useful for giving parents and patient an estimate of prognosis. It is worth emphasising the uncertainty of prognosis for the more severe trauma injuries. Avulsion and intrusion almost inevitably will lead to replacement resorption (root gradually replaced by bone) and tooth loss. The idea is to maintain the tooth as long as feasible, particularly to maintain the tooth until adulthood at which point an implant can be considered.

PDL Injuries – 5 year Pulpal Survival

Injury	Open Apex	Closed Apex
Concussion	100 %	95 %
Subluxation	100 %	85 %
Extrusion	95 %	45 %
Lateral luxation	95 %	25 %
Intrusion	40 %	0 %
Avulsion/Replantation	30 %	0 %

PDL Injuries – 5 year Resorption

Injury	Open Apex	Closed Apex
Concussion	1 %	3 %
Subluxation	1 %	3 %
Extrusion	5 %	7 %
Lateral luxation	3 %	38 %
Intrusion	67 %	100 %
Avulsion/Replantation	Frequent	

Concussion/Subluxation

	Concussion	Subluxation
Increased Mobility?	No	Yes
TTP?	Yes	Yes
Follow up clinical and radiographs:	4wks, 6-8wks, 1 year.	2wks, 4wks, 6-8wks, 1 year.
Splint:	No	2 Weeks flexible

With all luxation injuries:

Instruct on OHI with chlorhexidine gluconate and gentle brushing

Soft Diet

Avoid Contact Sports

Extrusion / Lateral Luxation

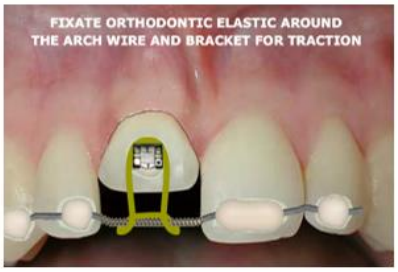
Lateral luxation:
- Displacement is accompanied by comminution or fracture of *either* the labial or the palatal/lingual alveolar bone.
- Tooth usually immobile

- Reposition under LA (buccal and palatal) Finger pressure and manipulation is preferred to use of forceps.
- Flexible splint
  - Extrusion 2 weeks
  - Lateral Luxation 4 weeks

• In most cases of lateral luxation the apex of the tooth has been forced into the bone by the displacement, **and the tooth is frequently non-mobile.**
• These can be tricky to reposition. Digital pressure should be applied in the buccal sulcus to the root apex and directed coronally (to "unlock" the tooth) before manipulating the tooth back into the socket.

Review
Clinical and radiographic control at 4 weeks, 6-8 weeks, 6 months, and 1 year.

Intrusion



High risk resorption - RCT considered with closed apex. Interim calcium hydroxide dressing recommended.

Apex	Intrusion severity	Repositioning: Spontaneous	Orthodontic	Surgical
Open	Up to 7 mm	*		
	More than 7 mm		*	*
Closed	Up to 3 mm	*		
	3-7 mm		*	*
	More than 7 mm			*

Review
Control after 2 weeks. Splint removal and control after 4 weeks, 6-8 weeks, 6 months, 1 year and yearly for 5 years

Avulsion – Replantation

•Successful healing can occur if there is only minimal damage to the pulp and the PDL

•Critical factors:

- Extra-alveolar dry time - EADT
- Extra-alveolar time - EAT
- Type of storage medium

If a patient attends with the tooth already replanted-

- Do not remove. Leave as in place and follow instructions regarding splinting etc dependent on circumstance
- Radiograph important to establish status of root development

- IF Extra-Alveolar Dry Time is short (15mins max) the PDL cells are most likely viable: The tooth may not undergo replacement resorption and is likely to have a good outcome ☺
- If EADT is < 60mins- PDL cells potentially viable but compromised
- If EADT is >60mins- PDL cells unlikely viable– but still replant!

EADT <60mins

AIM:

PDL healing

- EADT < 60 minutes and stored in an appropriate storage medium (e.g. milk, physiological saline or saliva) then there is a **chance of cemental/PDL healing**.
- Replant tooth under LA
- Flexible splint 7-14 days
- Prescribe antibiotics and check tetanus status
- Carry out pulp extirpation at 0-10 days UNLESS apex is open (immature root)
- Apex is open-> Once splinted, refer urgently to paediatric specialist for close follow-up
- Teeth with an open apex may revascularise

If apex is closed, refer to specialist once endodontic treatment and obturation is complete. Place ledermix/odontopaste in the canal and arrange urgent SCI gateway referral. (with email/telephone call)

If apex is open, reposition under LA and place flexible splint, and arrange urgent SCI gateway referral. (with email/telephone call)

Root treating avulsed tooth with closed apex

Mature apex (Closed Apex)

- After replantation and splinting, remove pulp as soon as possible. (Ideally day 0)
- Following extirpation and disinfection, place antibiotic-steroid paste as intra-canal medicament- **leave in place for 2 mths**
- **Remove splint after 7-14 days**
- At 2 mths- clean and replace intracanal medicament with Non Setting Calcium Hydroxide (eg. Ultracal or similar)
- Obturation with Gutta Percha should take place within 3 months
- Refer to a specialist via SCI gateway for further management

Teeth > 60mins EADT and apex is closed

Aim= Bony Healing

Review: 3,6,12mths then Yearly

- Unlikely to get PDL healing
- The aim is for bony healing (by ankylosis)
- Extra-oral endodontics can be carried out prior to replantation
  http://bspd.co.uk/Portals/0/Public/Files/Guidelines/avulsion_guidelines_v7_final_.pdf
- Replant tooth under LA
- Splint: 4 weeks flexible splint
- Consider antibiotic prescription
- If extra-oral endodontics not carried out- extirpate at 7-10 days and use Non Setting Calcium Hydroxide as initial intra-canal medicament for 4wks prior to obturation with Gutta Percha.

Once endodontics complete and the tooth is obturated, refer to specialist via SCI gateway. (routine referral)

Teeth > 60mins EADT and apex is OPEN

- Unlikely to get PDL healing
- Small chance that pulp may still revascularise
- Do not root treat unless signs of loss of vitality on follow-up
- Replant tooth under LA
- Splint: 1-2 weeks flexible splint
- Antibiotic prescription
- Check tetanus status
- Make Urgent referral to paeds specialist once splint placed. Follow with phone call. Needs monitored closely for signs of necrosis vs continued root development

Review Interval: 1-2wks (splint removal), 4wks, 2mths, 3mths, 6mths then yearly.

When not to replant??

- Almost never
- If very immature apex and EAT> 90mins (may still be best to replant)
- Child is immunocompromised (undergoing chemotherapy, significant cardiac disease)
- The child has other serious injuries and warrant preferential emergency treatment and / or intensive care being dealt with.

Even as a temporary space maintainer- the right choice is usually to replant

Long term consequences

Adverse effects on permanent teeth following trauma

Pulpal Canal Obliteration (PCO): Hard tissue healing can result in partial or complete pulp canal obliteration. These teeth usually remain vital. Unless signs of non-vitality are noted these teeth can be monitored. The excess tertirary dentine often produces a yellow colour to these teeth and cause cosmetic concern. First line intervention should focus upon vital tooth bleaching. Referrals for under 16s are accepted for this treatment.

Discolouration: Following trauma blood products can be released coronally into the dentine tubules leading to discolouration of the tooth. This is frequently associated with a loss of vitality although, infrequently, may be transient in the early stages of healing. Bleaching is the initial treatment option in persistent cases.

Pulpal necrosis: This is most likely in cases of avulsion or severe intrusion/extrusion, but is influenced by the maturity of the apex and open apices are more likely to remain vital. In teeth with immature apices a lack of continued root development is indicative of loss of vitality. In the initial healing period, two signs of non-vitality are required because of the high risks of false negatives from sensibility testing in traumatised teeth.y

Root resorption: Trauma tends to result in either external inflammatory or external replacement resorption (ankylosis).
Inflammatory resorption is driven by pulpal necrosis and RCT should be initiated.
Replacement resorption follows when the root surface is so badly damaged that it becomes re-modelled during skeletal turnover. It is irreversible but can occur at
differing rates and frequently depends on the age of the patient and growth development. In the growing patient, the tooth may become infra-occluded. If this occurs it can be decoronated and a prosthesis provided. This will prevent problems with alveolar development.

Though root resorption can present challenges to endodontics and sometimes need specialist level care, if suspected, first stage root canal treatment (full shaping) and dressing with calcium should still be undertaken in primary care as delays in treatment can be catastrophic.
Tooth Loss & Space loss: Teeth having lost considerable amounts of tooth structure or vitality may not survive in the long
term and the patient needs to be aware of this prospect. If a tooth is lost following trauma, then space can be lost rapidly; particularly in young patients. Provision of a partial denture is important to prevent space-loss.

Non-accidental injury

The General Dental Council states that all members of the dental team have an ethical obligation to take appropriate action if concerned about the possible abuse of a child.
Assessing a child with an injury with possible signs of abuse or neglect starts with a thorough history focussing upon:
• Details from the child and carer of the mechanism of injury
• Previous history of injuries that may be unexplained
• Social history – particularly in relation to unrelated adults living at home with the patient
• Full examination including dental, oral or facial injuries including site and extent
• The general appearance of the child, their state of hygiene, whether they appear to be growing well or failing to thrive
• Their demeanour with parents – are they interacting well or do they have a “frozen stare” where they take in everything going on but in a wary, fearful way.

What features would be of concern?
• A direct allegation (disclosure) may be made by the child/parent/another person
• Delayed presentation of injury (may be suggestive of neglect)
• Discrepancy between history and clinical findings
• Developmentally inappropriate findings i.e. history of fall in child not yet mobile
• Previous concerns about the child or siblings
• Concerns about the general or mental health of the parent (alcohol, substance misuse)

Report any conerns to NHS Ayrshire & Arran Child protection team on:
01563 826 001/002

www.dentaltrauma.co.uk

Dental Trauma UK

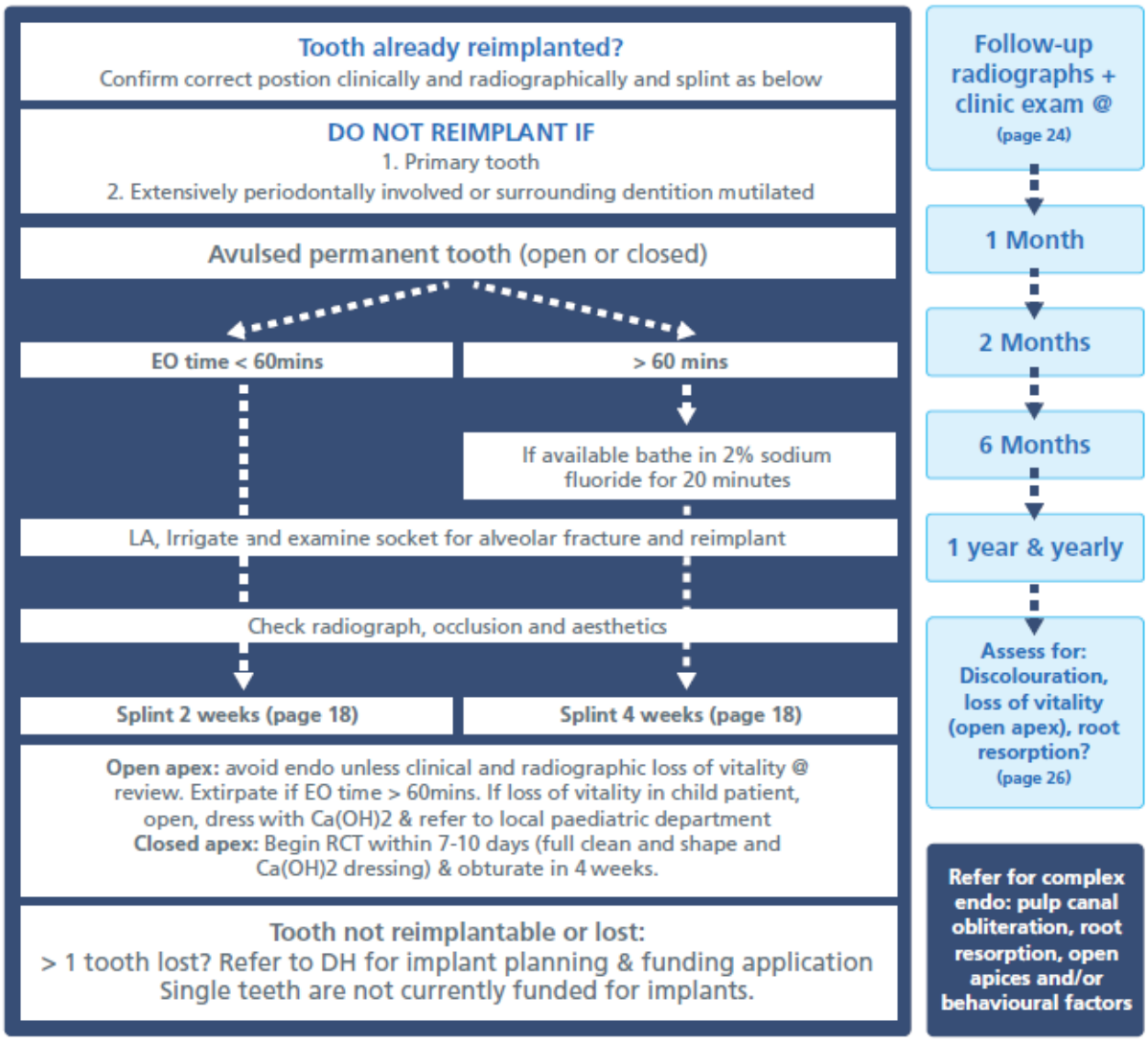
For access to the full content on dentaltraumaguide.org, consider purchasing membership with the charity dental trauma UK.

In addition to access to full content on dentaltraumaguide.org this, the charity offers:
1. Discount rates for the annual conference.
2. Free CPD including recordings of all the lectures from previous conferences.
3. How-to videos on splinting and management of avulsed and laterally luxated teeth.
4. Patient information leaflets for the practice.
5. Discussion forums and access to specialist advice and support.

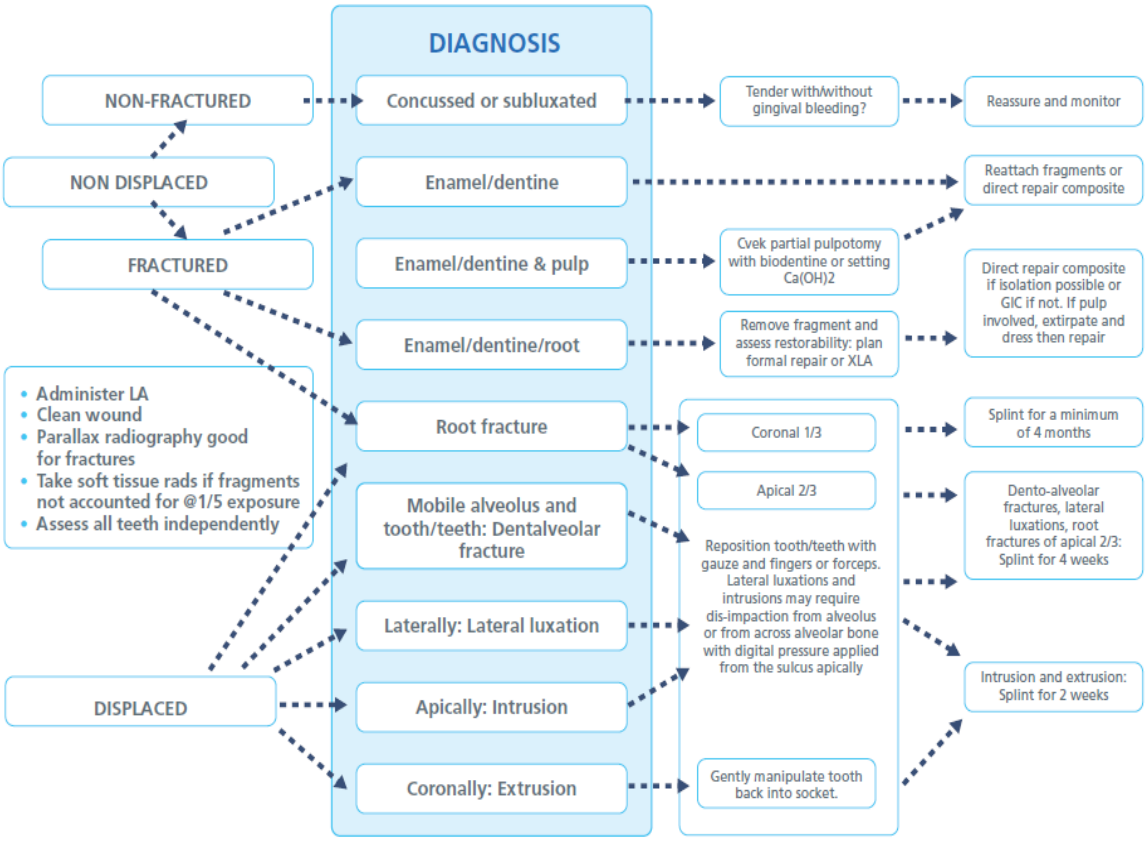
There is information for both public and professionals including:

1. Downloadable POSTERS on the management of dental trauma with the “Pick it, lick it, stick it” campaign.
2. Extensive information about the use of mouth guards to prevent injuries including details on the differing options including boil and bite, non-mouldable and custom fit mouth guards.
3. Self help videos for patients on the acute management of dental trauma.

Avulsion Flowchart:



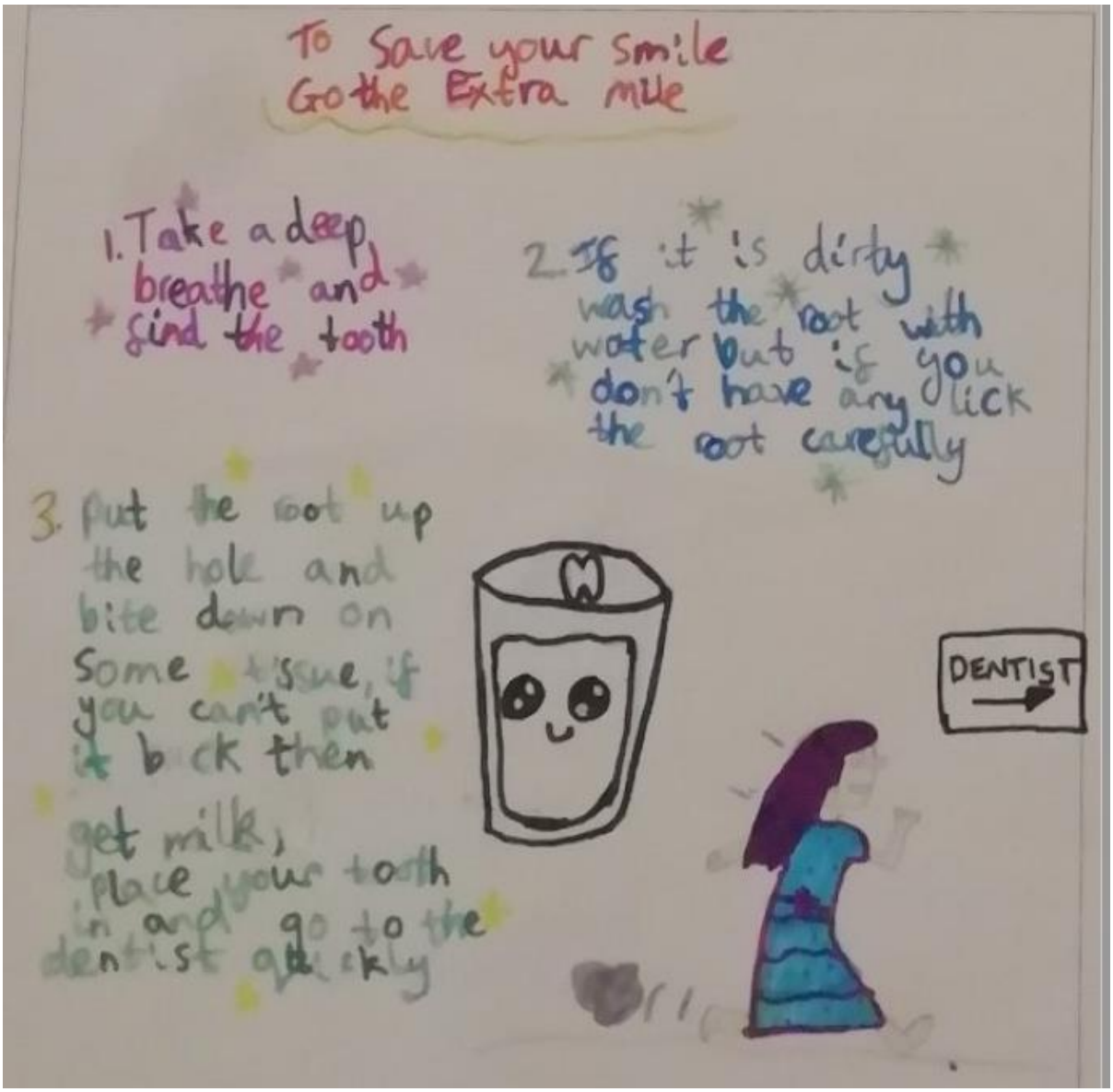
Summary of Permanent Tooth Trauma Management



References

1. Dentaltraumaguide.org
2. Dental Trauma UK
3. Greater Manchester Local Dental Trauma Network, Dental Toolkit

With thanks to South Ayrshire Pupils for their winning designs of the BSPD Dental Trauma Poster Competition in 2019.
Sophie Henderson (Front page) & Beth McCaughey (Below)



These are available for display in practices by contacting dentalservices@aapct.scot.nhs.uk