COMPREHENSIVE REVIEW

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International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 3. Injuries in the primary dentition

Correspondence

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Abstract

Traumatic injuries to the primary dentition present special problems that often require far different management when compared to that used for the permanent dentition. The International Association of Dental Traumatology (IADT) has developed these Guidelines as a consensus statement after a comprehensive review of the dental literature and working group discussions. Experienced researchers and clinicians from various specialties and the general dentistry community were included in the working group. In cases where the published data did not appear conclusive,

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recommendations were based on the consensus opinions or majority decisions of the working group. They were then reviewed and approved by the members of the IADT Board of Directors. The primary goal of these Guidelines is to provide clinicians with an approach for the immediate or urgent care of primary teeth injuries based on the best evidence provided by the literature and expert opinions. The IADT cannot, and does not, guarantee favorable outcomes from strict adherence to the Guidelines; however, the IADT believes their application can maximize the probability of favorable outcomes.

KEYWORDS

avulsion, luxation, prevention, tooth fracture, trauma

1 | INTRODUCTION

Injuries to children are a major threat to their health, and they are generally a neglected public health problem.¹ For children, aged 0-6 years, oral injuries account for 18% of all physical injuries and the mouth is the second most common area of the body to be injured.² A recent meta-analysis on traumatic dental injuries (TDIs) reveals a world prevalence of 22.7% affecting the primary teeth.³ Repeated TDIs are also frequently seen in children.⁴

Unintentional falls, collisions, and leisure activities are the most common reasons for TDIs, especially as children learn to crawl, walk, run, and embrace their physical environment. They most commonly occur between 2 and 6 years of age 4-7 with injuries to periodontal tissues occurring most frequently. Children with these injuries present to many healthcare settings, including general dental practitioners, emergency medical services, pharmacists, community dental clinics, and specialist dental services. Consequently, each service provider needs to have the appropriate knowledge, skills, and training in how to care for children with TDIs to their primary dentition.

The primary teeth Guidelines contain recommendations for the diagnosis and management of traumatic injuries to the primary dentition, assuming the child is medically healthy with a sound and caries-free primary dentition. Management strategies may change where multiple teeth are injured. Many articles have contributed to the content of these Guidelines and the treatment tables (1-12) and these articles are not mentioned elsewhere in this introductory text. ⁹⁻¹⁵

1.1 | Initial presentation and minimizing anxiety to the child and parent

Management of TDIs in children is distressing for both the child and the parents. It can also be challenging for the dental team. A TDI in the primary dentition often may be the reason for the child's first visit to the dentist. Minimizing anxiety for the child and parents, or other caregivers, during the initial visit is essential. At this young age, the child may resist co-operating for an extensive examination, radiographs, and treatment. Knee-to-knee examination can be helpful in examining a young child. Information about how to undertake an examination

of a child with a TDI involving their primary dentition can be found in current textbooks¹⁶⁻¹⁸ or can be viewed in the following video (https://tinyurl.com/kneetokneeexamination). Wherever possible, the acute and follow-up dental care should be provided by a child-oriented team that has experience and expertise in the management of pediatric oral injuries. These teams are best placed to access specialist diagnostic and treatment services, including sedation and general anesthesia, and pain management for the prevention or minimization of suffering.¹⁹

1.2 | A structured approach

It is essential that clinicians adopt a structured approach to managing traumatic dental injuries. This includes history taking, undertaking the clinical examination, collecting test results, and how this information is recorded. The literature shows that the use of a structured history at the initial consultation leads to a significant improvement in the quality of the trauma records involving the permanent dentition^{5,20}. There are a variety of structured histories available in current textbooks^{16–18} or used at different specialist centers.^{21,22} Extra-oral and intra-oral photographs act as a permanent record of the injuries sustained and are strongly recommended.

1.3 | Initial assessment

Elicit a careful medical, social (including those who attend with the child), dental, and accident history. Thoroughly examine the head and neck and intra-orally for both bony and soft tissue injuries. ^{17,18} Be alert to concomitant injuries including head injury, facial fractures, missing tooth fragments, or lacerations. Seek a medical examination if necessary.

1.4 | Soft tissue injuries

It is essential to identify, record, and diagnose extra-oral and intraoral soft tissue injuries. ^{18,23} The lips, oral mucosa, attached and free gingivae, and the frenula should be checked for lacerations and hematomas. The lips should be examined for possible embedded tooth fragments. The presence of a soft tissue injury is strongly associated with the pursuit of immediate care. Such injuries are most commonly found in the 0- to 3-year age group. ²⁴ Management of soft tissues, beyond just first aid, should be provided by a child-oriented team with experience in pediatric oral injuries. Parental engagement with the homecare for soft tissue injuries to the gingivae is critical and will influence the outcomes for healing of the teeth and soft tissues. Parental homecare instructions for intra-oral soft tissue injuries are described later in these Guidelines.

1.5 | Tests, crown discoloration, and radiographs

Extra-oral and intra-oral photographs are strongly recommended.

Pulp sensibility tests are unreliable in primary teeth and are therefore not recommended.

Tooth mobility, color, tenderness to manual pressure, and the position or displacement should be recorded.

The color of injured and uninjured teeth should be recorded at each clinic visit. Discoloration is a common complication following luxation injuries. 8,25-27 This discoloration may fade, and the tooth may regain its original shade over a period of weeks or months. 8,28-30 Teeth with persistent dark discoloration may remain asymptomatic clinically and radiographically normal, or they may develop apical periodontitis (with or without symptoms). 31,32 Root canal treatment is not indicated for discolored teeth unless there are clinical or radiographic signs of infection of the root canal system. 18,33

Every effort has been made in these Guidelines to reduce the number of radiographs needed for accurate diagnosis, thus minimizing a child's exposure to radiation. For essential radiographs, radiation protection includes the use of a thyroid collar where the thyroid is in the path of the primary X-ray beam and a lead apron for when parents are holding the child. Radiation-associated risks for children are a concern as they are substantially more susceptible to the effects of radiation exposure for the development of most cancers than adults. This is due to their longer life expectancy and the acute radiosensitivity of some developing organs and tissues. 34,35 Therefore, clinicians should question each radiograph they take and cognitively ask whether additional radiographs will positively affect the diagnosis or treatment provided for the child. Clinicians must work within the ALARA (As Low As Reasonably Achievable) principles to minimize the radiation dose. The use of CBCT following TDI in young children is rarely indicated.³⁶

1.6 | Diagnosis

A careful and systematic approach to diagnosis is essential. Clinicians should identify all injuries to each tooth including both hard tissues injuries (eg, fractures) and periodontal injuries (eg, luxations). When concomitant injuries occur in the primary dentition following extrusion and lateral luxation injuries, they have a detrimental impact

on pulp survival.²⁷ The accompanying tables (1-12) and the trauma pathfinder diagram (www.dentaltraumaguide.org) help clinicians identify all possible injuries for each injured tooth.

1.7 | Intentional (non-accidental) injuries

Dental and facial trauma can occur in cases of intentional injuries. Clinicians should check whether the history of the accident and the injuries sustained are consistent or match. In situations where there is suspicion of abuse, prompt referral for a full physical examination and investigation of the incident should be arranged. Referral should follow local protocols, which is beyond the scope of these Guidelines.

1.8 | Impact of orofacial and primary tooth trauma on the permanent dentition

There is a close spatial relationship between the apex of the primary tooth root and the underlying permanent tooth germ. Tooth malformation, impacted teeth, and eruption disturbances in the developing permanent dentition are some of the consequences that can occur following injuries to primary teeth and the alveolar bone. ³⁷⁻⁴³ Intrusion and avulsion injuries are most commonly associated with the development of anomalies in the permanent dentition. ³⁷⁻⁴²

For intrusive and lateral luxation injuries, previous Guidelines have recommended the immediate extraction of the traumatized primary tooth if the direction of displacement of the root is toward the permanent tooth germ. This action is no longer advised due to (a) evidence of spontaneous re-eruption for intruded primary teeth, ^{8,10,26,43-45} (b) the concern that further damage may be inflicted on the tooth germ during extraction, and (c) the lack of evidence that immediate extraction will minimize further damage to the permanent tooth germ.

It is very important to document that parents have been informed about possible complications to the development of the permanent teeth, especially following intrusion, avulsion, and alveolar fractures.

1.9 | Management strategy for injuries to the primary dentition

In general, there is limited evidence to support many of the treatment options in the primary dentition. Observation is often the most appropriate option in the emergency situation unless there is risk of aspiration, ingestion, or interference with the occlusion. This conservative approach may reduce additional suffering for the child¹⁸ and the risk of further damage to the permanent dentition. ^{18,46,47}

A summary of the management of TDIs in the primary dentition includes the following:

 A child's maturity and ability to cope with the emergency situation, the time for shedding of the injured tooth, and the occlusion are all important factors that influence treatment.

- It is critical that parents are given appropriate advice on how best to manage the acute symptoms to avoid further distress. 48,49
 Luxation injuries, such as intrusion and lateral luxation, and root fractures may cause severe pain. The use of analgesics such as ibuprofen and/or acetaminophen (paracetamol) is recommended when pain is anticipated.
- Minimizing dental anxiety is essential. Provision of dental treatment depends on the child's maturity and ability to cope. Various behavioral approaches are available^{50–51}and have been shown to be effective for managing acute procedures in an emergency situation.^{52,53} TDIs and their treatment have the potential to lead to both post-traumatic stress disorder and dental anxiety. The development of these conditions in young children is a complex issue^{54,55} with little research specifically examining either condition following TDIs in the primary dentition. However, evidence from the wider dental literature suggests that the multi-factorial nature of dental anxiety, its fluctuating nature, and the role of dental extractions are exacerbating factors.^{56–58} Where possible, avoidance of dental extractions, especially at the acute or initial visit, is a reasonable strategy.
- Where appropriate and the child's cooperation allows, options
 that maintain the child's primary dentition should be the priority.⁵⁹ Discussions with parents about the different treatment options should include the potential for further treatment visits and
 consideration for how best to minimize the impact of the injury on
 the developing permanent dentition.⁶⁰
- For crown and crown-root fractures involving the pulp, root fractures, and luxation injuries, rapid referral within several days to a child-oriented team that has experience and expertise in the management of dental injuries in children is essential.
- Splinting is used for alveolar bone fractures^{40,61} and occasionally may be needed in cases of root fractures⁶² and lateral luxations.⁶²

1.10 | Avulsed primary teeth

An avulsed primary tooth should not be replanted. Reasons include a significant treatment burden (including replantation, splint placement and removal, root canal treatment) for a young child as well as the potential of causing further damage to the permanent tooth or to its eruption. ^{40,41,63,64} However, the most important reason is to avoid a medical emergency resulting from aspiration of the tooth. Careful follow up is required to monitor the development and eruption of the permanent tooth. Refer to the accompanying table () for specific guidance.

1.11 | Antibiotics and Tetanus

There is no evidence for recommending the use of systemic antibiotics in the management of luxation injuries in the primary dentition. However, antibiotic use does remain at the discretion of the clinician when TDIs are accompanied by soft tissue and other associated injuries or significant surgical intervention is required. Finally, the child's medical status may warrant antibiotic coverage. The child's pediatrician should be contacted where questions arise in these situations.

A tetanus booster may be required if environmental contamination of the injury has occurred. If in doubt, refer to a medical practitioner within 48 hours.

1.12 | Parental instructions for homecare

Successful healing following an injury to the teeth and oral tissues depends on good oral hygiene. To optimize healing, parents or caregivers should be advised regarding care of the injured tooth/teeth and the prevention of further injury by supervising potentially hazardous activities. Clean the affected area with a soft brush or cotton swab and use alcohol-free chlorhexidine gluconate 0.12% mouth rinse applied topically twice a day for one week to prevent accumulation of plaque and debris and to reduce the bacterial load. Care should be taken when eating not to further traumatize the injured teeth while encouraging a return to normal function as soon as possible.

Parents or caregivers should be advised about possible complications that may occur, such as swelling, increased mobility, or a sinus tract. Children may not complain about pain, but infection may be present. Parents or caregivers should watch for signs of infection such as swelling of the gums. If present, they should take the child to a dentist for treatment. Examples of unfavorable outcomes are found in the table for each injury (Tables 1-12).

1.13 | Training, skills, and experience for teams managing the follow-up care

During the follow-up phase of treatment, dental teams caring for children with complex injuries to the primary dentition should have specialist training, experience, and skills. These attributes enable the members of the team to respond appropriately to the medical, physical, emotional, and developmental needs of children and their families. In addition, skills within the team should also encompass health promotion and access to specialist diagnostic and treatment services including sedation, general anesthesia, and overall pain management for the prevention or minimization of suffering. ¹⁹

1.14 | Prognosis

Factors relating to the injury and subsequent treatment may influence pulp and periodontal outcomes, and they should be carefully recorded. These prognostic factors need to be carefully collected at both the initial consultation and follow-up visits. This is most likely achieved using the structured history form described previously. The dental literature and appropriate websites (eg, www.dentaltrau maguide.org) provide clinicians with useful information on the probable pulp and periodontal prognosis. These sources of information can be invaluable when having conversations with the parents or caregivers and the child.

TABLE 1 Treatment guidelines for primary teeth: Enamel fractures

	Radiographic			Favorable and unfavorable outcoall, of the following	Favorable and unfavorable outcomes include some, but not necessarily all, of the following
Enamel fracture	recommendations	Treatment	Follow up	Favorable outcomes	Unfavorable outcomes
	 No radiographs 	 Smooth any sharp edges. 	No clinical or	 Asymptomatic 	Symptomatic
	recommended	 Parent/patient education: 	radiographic follow	 Pulp healing with: 	 Crown discoloration
100		- Exercise care when eating not to further	np recommended	 Normal color of the 	 Signs of pulp necrosis and
		traumatize the injured tooth while encouraging		remaining crown	infection—such as:
		a return to normal function as soon as possible.		- No signs of pulp necrosis	 Sinus tract, gingival swelling,
		- Encourage gingival healing and prevent plaque		and infection	abscess, or increased mobility
15.01.01.01.01.01		accumulation by parents cleaning the affected		 Continued root 	 Persistent dark gray
Cillical Initimiss.		area with a soft brush or cotton swab combined		development in immature	discoloration with one or more
riacture illivolves		with an alcohol-free 0.1 to 0.2% chlorhexidine		teeth	other signs of infection
ellalliel Olliy		gluconate mouth rinse applied topically twice a			 Radiographic signs of pulp
		day for 1 wk			necrosis and infection
					 No further root development of
					immature teeth

 TABLE 2
 Treatment guidelines for primary teeth: Enamel-dentin fractures (with no pulp exposure)

Enamel-dentin fracture (with no	Radiographic			Favorable and unfavorable outc necessarily all, of the following	Favorable and unfavorable outcomes include some, but not necessarily all, of the following
pulp exposure)	recommendations	Treatment	Follow up	Favorable outcome	Unfavorable outcome
	Baseline radiograph	Cover all exposed deptip with	Clinical examination	Asymptomatic	Symptomatic
	ontional	glace ionomer or composite	offer 6-8 wh	Dulp bealing with:	Crown discoloration
1	Optional Take a radiograph of the	I oct tooth etricture can be	Radiographic following	- raip licalling with:	Signs of pulls pectagis and
	soft tissues if the fractured		indicated only when	remaining crown	infection—such as:
	fragment is suspected to	immediately or at a later	clinical findings are	- No signs of pulp	- Sinus tract, gingival
Clinical findings: Fracture	be embedded in the lips,	appointment	suggestive of pathosis	necrosis and infection	swelling, abscess, or
involves enamel and dentin. The	cheeks, or tongue	 Parent/patient education: 	(eg, signs of pulp	 Continued root 	increased mobility
pulp is not exposed		- Exercise care when eating	necrosis and infection)	development in	 Persistent dark gray
 The location of missing tooth 		not to further traumatize	 Parents should watch 	immature teeth	discoloration with one
fragments should be explored		the injured tooth while	for any unfavorable		or more other signs of
during the trauma history		encouraging a return to	outcomes. If seen, the		root canal infection
and examination, especially		normal function as soon as	child needs to return		- Radiographic signs
when the accident was not		possible	to the clinic as soon		of pulp necrosis and
witnessed by an adult or there		- Encourage gingival healing	as possible. When		infection
was a loss of consciousness		and prevent plaque	unfavorable outcomes		 No further root
 Note: While fragments are 		accumulation by parents	are identified, treatment		development of immature
most often lost out of the		cleaning the affected area	is often required		teeth
mouth, there is a risk that they		with a soft brush or cotton	 The follow-up 		
can be embedded in the soft		swab combined with an	treatment, which		
tissues, ingested, or aspirated		alcohol-free 0.1 to 0.2%	frequently requires		
		chlorhexidine gluconate	the expertise of a		
		mouth rinse applied topically	child-oriented team, is		
		twice a day for 1 wk	outside the scope of		
			these guidelines		

TABLE 3 Treatment guidelines for primary teeth: Complicated crown fractures (with pulp exposure)

one or more signs of and infection—such as: of pulp necrosis and swelling, abscess, or Persistent dark gray - Sinus tract, gingival root canal infection Signs of pulp necrosis Radiographic signs increased mobility Favorable and unfavorable outcomes include some, discoloration with Crown discoloration Unfavorable outcome No further root development of immature teeth Symptomatic infection but not necessarily all, of the following Normal color of the remaining crown No signs of pulp Pulp healing with: Continued root development in immature teeth Favorable outcome necrosis and Asymptomatic infection return to the clinic as soon as possible. Where unfavorable oriented team, is outside the pathosis (eg, an unfavorable treatment is often required. Other radiographs are only any unfavorable outcomes. Clinical examination after: If seen, the child needs to which frequently requires Radiographic follow up at findings are suggestive of The follow-up treatment, scope of these guidelines Parents should watch for 1 y following pulpotomy outcomes are identified, or root canal treatment. the expertise of a childindicated where clinical 6-8 wk outcome) Follow up with the parents. Each option is invasive procedures. Therefore, discuss different treatment options (including pulpotomy) prevent plaque accumulation, parents management of pediatric dental injuries. should clean the affected area with a applied topically twice a day for 1 wk Preserve the pulp by partial pulpotomy. staining calcium silicate-based cements while encouraging a return to normal several days) to the child-oriented team chlorhexidine gluconate mouth rinse cover this with a glass ionomer cement large pulp exposures. The evidence for is emerging. Clinicians should focus on soft brush or cotton swab combined further traumatize the injured tooth appropriate case selection rather than term dental anxiety. Treatment is best pulpotomy is indicated for teeth with using other biomaterials such as non-Often no treatment may be the most To encourage gingival healing and with experience and expertise in the and then a composite resin. Cervical appropriate option in the emergency non-setting calcium hydroxide paste situation, but only when there is the should be applied over the pulp and and has the potential to cause longperformed by a child-oriented team Local anesthesia will be required. A Exercise care when eating not to with an alcohol-free 0.1 to 0.2% Treatment depends on the child's potential for rapid referral (within function as soon as possible. maturity and ability to tolerate Parent/patient education: the material used Treatment Radiographic recommendations A periapical radiograph (using embedded in the lips, cheeks, size 2 sensor/film) should be fragment is suspected to be purposes and to establish a a size 0 sensor/film and the paralleling technique) or an occlusal radiograph (with a presentation for diagnostic soft tissues if the fractured taken at the time of initial Take a radiograph of the or tongue embedded in the soft loss of consciousness risk that they can be tissues, ingested, or often lost out of the adult or there was a especially when the fragments are most be explored during the trauma history fragments should mouth, there is a Complicated crown and examination, accident was not enamel and dentin witnessed by an Fracture involves The location of fracture (ie, with Clinical findings: plus the pulp is missing tooth Note: While (dlnd pasodxa aspirated exposed.

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		Favorable and unfavorable outonecessarily all, of the following	Favorable and unfavorable outcomes include some, but not necessarily all, of the following
Treatment	Follow up	Favorable outcome	Unfavorable outcome
Often no treatment may be the most appropriate option in the emergency situation, but only when there is the potential for rapid referral (within several days) to a child-oriented team. If treatment is considered at the emergency appointment, local anesthesia will be required Remove the loose fragment and determine if the crown can be restored Option A: If restorable and no pulp exposed, cover the exposed dentine with glass ionomer If restorable and the pulp is exposed, perform a pulpotomy (see crown fracture with exposed dentine with glass ionomer If restorable and the pulp is exposed, perform a pulpotomy (see crown fracture with exposed pulp) or root canal treatment, depending on the stage of root development and the level of the fracture. Option B: If unrestorable, extract all loose fragments taking care not to damage the permanent successor tooth and leave any firm root fragment in situ, or extract the entire tooth Treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment options (including extraction) with the parents. Each option is invasive and has the potential to cause long-term dental anxiety. Treatment is best performed by a child-oriented team with experience and expertise in the management of pediatric dental injuries• Parent/patient education: Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1% to 0.2% chlorhexidine gluconate mouth rinse applied topically twice a day for 1 wk	Where tooth is retained, clinical examination after: - 1 wk - 6-8 wk - 1 y - Radiographic follow up after 1 y following pulpotomy or root canal treatment. Other radiographs only indicated where clinical findings are suggestive of pathosis (eg, an unfavorable outcome) - Parents should watch for any unfavorable outcomes. If seen, the child needs to return to the clinic as soon as possible. Where unfavorable outcomes are identified, treatment is often required treatment is often required treatment is often required treatment is often required treatment is outside the scope of these guidelines	Asymptomatic Pulp healing with: Normal color of the remaining crown No signs of pulp necrosis and infection Continued root development in immature teeth	Symptomatic Crown discoloration Signs of pulp necrosis and infection—such as: - Sinus tract, gingival swelling, abscess, or increased mobility - Persistent dark gray discoloration with one or more signs of root canal infection - Radiographic signs of pulp necrosis and infection - Radiographic signs of pulp infection - No further root development of immature teeth
de ex hara hara hara hara hara hara hara har	ten no treatment may be the most propriate option in the emergency situation, tonly when there is the potential for rapid eeral (within several days) to a child-oriented an invented with the potential for rapid eeral (within several days) to a child-oriented and when there is the potential for rapid eeral (within several days) to a child-oriented pointment, local anesthesia will be required move the loose fragment and determine if exposed the loose fragment and determine if restorable and no pulp exposed, cover the exposed dentine with glass ionomer. If restorable and the pulp is exposed, perform a pulpotomy (see crown fracture with exposed dentine with glass ionomer and the level of the fracture. Stion B: If unrestorable, extract all loose fragments taking care not to damage the permanent successor tooth and leave any firm root fragment depends on the child's maturity and illity to tolerate the procedure. Therefore, cruss treatment options (including extraction) the the parents. Each option is invasive and sthe potential to cause long-term dental xiety. Treatment is best performed by a ild-oriented team with experience and pertise in the management of pediatric raumatize the injured tooth while encouraging a return to normal function as soon as possible To encourage gingival healing and prevent plaque accumulation, parents should dean the affected area with an alcohol-free 0.1% to 0.2% chlorhexidine gluconate mouth rinse applied topically twice a day for 1 wk	• o treatment may be the most iste option in the emergency situation, when there is the potential for rapid (within several days) to a child-oriented the loose fragment and determine if the loose fragment and loose fragment. **A: **Carable and no pulp exposed, cover the expedentine with glass ionomer **Exposed pulp) or root canal treatment, ading on the stage of root development **A: **Exposed pulp) or root canal treatment, ading on the stage of root development **A: **Exposed pulp) or root canal treatment **Exposed pulp) or root development **Exposed pulp or course long-term dental **Irreatment bytions (including extraction) **Preatment bytions (including extraction) **Preatment potions (including e	reatment may be the most when there is the potential for rapid (within several days) to a child-oriented (including expressed, cover the corable and the pulp is exposed, cover the corable and the pulp is exposed. 3. 4. 5. 6. 8. 4. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.

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• A periapical (size 0 sensor/film, paralleling treatment is required technique) or occuca latchingular of the coronal fragment is displaced and is not reconsingular by conclusal interference and initial presentation for a fire coronal fragment is displaced, excessively mobile and interfering with occlusion, two options are available, both of which require local anesthesia options are available, both of which require local anesthesia an		Follow up	Favorable outcome	Unfavorable outcome
technique) or occlusal excessively mobile, leave the coronal fragment to sensor/film, should be recessively mobile, leave the coronal fragment to spontaneously reposition even if there is some occlusal interference initial presentation for or first the coronal fragment is displaced, excessively mobile and interfering with occlusion, two options are available, both of which require local baseline The fracture is usually option A: Option A: Option B: - Cartact only the loose coronal fragment. The apical fragment should be left in place to be resorbed Option B: - Cantly reposition the loose coronal fragment. If the fragment is unstable in its new position, stabilize the fragment with a flexible splint attached to the adjacent uninjured teeth. Leave the splint in place for 4 wk The treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment depends on the child sent with experience and expe	•	 Where no displacement of 	 Asymptomatic 	Symptomatic
technique) or occlusal • If the coronal fragment is displaced and is not radiograph (size 2 sexessively mobile, leave the coronal fragment to spontaneously reposition even if there is some occlusal interference initial presentation for mobile and interfering with occlusion, two mobile and interfering with occlusion to the apical third • Option 8: - Gently reposition the loose coronal fragment. The rasored the splint in place for 4 wk • The treatment depends on the child smaturity and ability to tolerate the procedure. Therefore, discuss treatment options with the parents. Each option is invasive and has the potential to cause long-term dental anxiety. Treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team • Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible -1 To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft bursh or cotton swab combined with an alcohol-free O.2%-C.2% chlond-exiging gluconate mouth rinse applied		coronal fragment, clinical	 Pulp healing with: 	 Signs of pulp necrosis
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diagnostic purposes mobile and interfering with occlusion, two and to exbalish a mobile and interfering with occlusion, two and to exbalish a most head an east-head an east-head an east-head octed mid-root or in the apical fragment should be left in place to be resorbed. • Option B: - Gently reposition the loose coronal fragment. The apical third resorbed control fragment is unstable in its new position, stabilize the fragment is unstable in its new position, stabilize the fragment with a flexible splint attached to the adjacent uninjured teeth. Leave the splint in place for 4 wk • The treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment options with the parents. Each option is invasive and has the potential to cause long-term dental anxiety. Treatment is best performed by a child-oriented team with experience and expertise in the management of pediatric dental injuries. Often no treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team. • Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible. - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft bursh or cotton swab combined with an alcohol-free 0.1%-0.2% chlonhexidine gluconate mouth rinse applied		- 1 y and where there are	discoloration and pulp	increased mobility
diagnostic purposes mobile and interfering with occlusion, two and to establish a mesthesia baseline The fracture is usually Option A: Option B: - Gently reposition the loose coronal fragment. The apical fragment should be left in place to be resorbed Option B: - Gently reposition the loose coronal fragment. If the fragment is unstable in its new position, stabilize the fragment with a flexible splint attached to the adjacent uniqued teeth. Leave the splint in place for 4 wk The treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment options with the parents. Each option is invasive and has the potential to cause long-term dental anxiety. Treatment is best performed by a child-oriented team with experience and expertise in the management of pediatric dental injuries. Often no treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	•	clinical concerns that an	canal obliteration	 Persistent dark gray
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• Option A: - Extract only the loose coronal fragment. The apical fragment should be left in place to be resorbed • Option B: - Gently reposition the loose coronal fragment. If the fragment is unstable in its new position, stabilize the fragment with a flexible splint attached to the adjacent uninjured teeth. Leave the splint in place for 4 wk - The treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment options with the parents. Each option is invasive and has the potential to cause long-term dental anxiety. Treatment is best performed by a child-oriented team with experience and expertise in the management of pediatric dental injuries. Often no treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team - Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied		- Then continue clinical follow	necrosis and infection	one or more signs of
• The fracture is usually • Option A: - Extract only the loose coronal fragment. The apical third - Extract only the loose coronal fragment. The apical third - Option B: - Gently reposition the loose coronal fragment. If the fragment is unstable in its new position, stabilize the fragment with a flexible splint attached to the adjacent uninjured teeth. Leave the splint in place for 4 wk - The treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment options with the parents. Each option is invasive and has the potential to cause long-term dental anxiety. Treatment is best performed by a child-oriented team with experience and expertise in the management of pecliatric dental injuries. Often no treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team - Farent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	anesthesia	up each year until eruption of	- Continued root	root canal infection
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If the fragment is unstable in its new position, stabilize the fragment with a flexible splint attached to the adjacent uninjured teeth. Leave the splint in place for 4 wk • The treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment options with the parents. Each option is invasive and has the potential to cause long-term dental anxiety. Treatment is best performed by a child-oriented team with experience and expertise in the management of pediatric dental injuries. Often no treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team • Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	- Gently reposition the loose coronal fragment.	 4 wk for splint removal 	 Resorption of the apical 	(inflammatory)
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cause long-term dental anxiety. Treatment is best performed by a child-oriented team with experience and expertise in the management of pediatric dental injuries. Often no treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	arseass a caument options with the parents.	then continue clinical follow		
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experience and expertise in the management of pediatric dental injuries. Often no treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	best performed by a child-oriented team with	permanent teeth		
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potential for rapid referral (within several days) to the child-oriented team Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	emergency scenario, but only when there is the	unfavorable outcome)		
to the child-oriented team Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	potential for rapid referral (within several days)	 Parents should be informed 		
Parent/patient education: - Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible - To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	to the child-oriented team	to watch for any unfavorable		
ging sible on 0.2%		outcomes and the need to return		
iging sible sible on 0.2%	- Exercise care when eating not to further	to the clinic as soon as possible.		
sible on 0.2%	traumatize the injured tooth while encouraging	Where unfavorable outcomes		
on 0.2% ed	a return to normal function as soon as possible	are identified, treatment is often		
on 0.2% ed	- To encourage gingival healing and prevent	required.		
the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	plague accumulation, parents should clean	 The follow-up treatment, which 		
swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied	the affected area with a soft brush or cotton	frequently requires the expertise		
chlorhexidine gluconate mouth rinse applied	swab combined with an alcohol-free 0.1%-0.2%	of a child-oriented team, is		
	chlorhexidine gluconate mouth rinse applied	outside the scope of these		
topically twice a day for 1 wk	topically twice a day for 1 wk	guidelines		

TABLE 6 Treatment guidelines for primary teeth: Alveolar fractures

	Radiographic			Favorable and unfavorable outc	Favorable and unfavorable outcomes include some, but not necessarily all, of the following
Alveolar fracture	recommendations and findings	Treatment	Follow up	Favorable outcome	Unfavorable outcome
	 A periapical (size 0 sensor/ 	 Reposition (under local 	 Clinical examination after: 	 Asymptomatic 	Symptomatic
131	film, paralleling technique)	anesthesia) any displaced segment	- 1 wk	 Pulp healing with: 	 Signs of pulp necrosis and
	or occlusal radiograph (size	which is mobile and/or causing	 4 wk for splint removal 	- Normal crown	infection—such as:
	2 sensor/film) should be	occlusal interference	- 8 wk	color or transient	 Sinus tract, gingival
	taken at the time of initial	 Stabilize with a flexible splint to 	- 1y	red/gray or yellow	swelling, abscess, or
Clinical findings: The	presentation for diagnostic	the adjacent uninjured teeth for	- Further follow up at 6 y of	discoloration and pulp	increased mobility
fracture involves the	purposes and to establish a	4 wk	age is indicated to monitor	canal obliteration	 Persistent dark gray
alveolar hope (labial	baseline	 Treatment should be performed 	eruption of the permanent	 No signs of pulp 	discoloration plus one
and palatal/lingual)	 A lateral radiograph may 	by a child-oriented team with	teeth	necrosis and infection	or more signs of root
and may extend to the	give information about the	experience and expertise in the	 Radiographic follow up at 	 Continued root 	canal infection
adiacent hone	relationship between the	management of pediatric dental	4 w and 1 y to assess impact	development in	- Radiographic signs
Mobility and	maxillary and mandibular	injuries	on the primary tooth and the	immature teeth	of pulp necrosis and
distonation of the	dentitions and if the	 Parent/patient education: 	permanent tooth germs in the	 Periodontal healing 	infection including
alsiocation of the	segment is displaced in a	- Exercise care when eating	line of the alveolar fracture. This	 Realignment of the 	infection-related
segment with	labial direction	not to further traumatize the	radiograph may indicate a more	alveolar segment with	(inflammatory)
moving togother are	 Fracture lines may be 	injured teeth while encouraging	frequent follow-up regimen is	the original occlusion	resorption
common findings	located at any level, from	a return to normal function as	needed. Other radiographs are	restored	 No further root
• Occlusal	the marginal bone to the	soon as possible	indicated only where clinical	 No disturbance to the 	development in immature
interference is	root apex or beyond,	- To encourage gingival	findings are suggestive of	development and/	teeth
iiiteileieiteis	and they may involve the	healing and prevent plaque	pathosis (eg, an unfavorable	or eruption of the	 Limited or no
	primary teeth and/or their	accumulation, parents should	outcome)	permanent successor	improvement in the
	permanent successors	clean the affected area with	 If the fracture line is located 		position of the displaced
	 Further imaging may be 	a soft brush or cotton swab	at the level of the primary root		segment and the
	needed to visualize the	combined with an alcohol-	apex, an abscess can develop. A		original occlusion is not
	extent of the fracture(s)	free 0.1%-0.2% chlorhexidine	periapical radiolucency can be		re-established
	but only where it is likely	gluconate mouth rinse applied	seen on the radiograph		 Negative impact on the
	to change the treatment	topically twice a day for 1 wk	 Parents should be informed 		development and/or
	provided.		to watch for any unfavorable		eruption of the permanent
			outcomes and the need to return		successor
			to the clinic as soon as possible.		
			Where unfavorable outcomes		
			are identified, treatment is often		
			required		
			 The follow-up treatment, which 		
			frequently requires the expertise		
			of a child-oriented team, is		
			outside the scope of these		
			guidelines		

TABLE 7 Treatment guidelines for primary teeth: Concussion

	Radiographic			Favorable and unfavorable outc	Favorable and unfavorable outcomes include some, but not necessarily all, of the following
Concussion	recommendations	Treatment	Follow up	Favorable outcome	Unfavorable outcome
Clinical findings: The tooth is tender to touch but it has not been displaced I has normal mobility and no sulcular bleeding	No baseline radiograph recommended	No treatment is needed. Observation Parent/patient education: Exercise care when eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab	Clinical examination after: 1 wk 6-8 wk Radiographic follow up only indicated where clinical findings are suggestive of pathosis (eg, an unfavorable outcome) Parents should be informed to watch for any unfavorable outcomes and the need to return to the clinic as soon as possible. Where unfavorable outcomes are soon as possible. Where the the clinic as soon as possible in the required the control of the control of the clinic and the need to return to the clinic as soon as possible. Where the clinic as soon as possible in the control of	Asymptomatic Pulp healing with: Normal color of the crown or transient red/gray or yellow discoloration and pulp canal obliteration No signs of pulp necrosis and infection Continued root development in immature teeth No disturbance to the	Signs of pulp necrosis and infection—such as: - Sinus tract, gingival swelling, abscess, or increased mobility - Persistent dark gray discoloration plus one or more other signs of root canal infection Radiographic signs of pulp necrosis and infection No further root development of immature teeth Manual Control of the control of th
		combined with an alcohol- free 0.1%-0,2% mouth rinse chlorhexidine gluconate applied topically twice a day for 1 wk	 The follow-up treatment, which frequently requires the expertise of a child-oriented team, is outside the scope of these guidelines 	development and/or eruption of the permanent successor	 Negative impact on the development and/or eruption of the permanent successor

TABLE 8 Treatment guidelines for primary teeth: Subluxation

	Radiographic			Favorable and unfavorable outc necessarily all, of the following	Favorable and unfavorable outcomes include some, but not necessarily all, of the following
Subluxation	and findings	Treatment	Follow up	Favorable outcome	Unfavorable outcome
Clinical findings: The tooth is tender to touch and it has increased mobility, but it has not been displaced elisplaced gingival crevice may be noted	• A periapical (size 0 sensor/ film, paralleling technique) or occlusal radiograph (size 2 sensor/film) should be taken at the time of initial presentation for diagnostic purposes and to establish a baseline • Normal to slightly widened periodontal ligament space will be visible	No treatment is needed. Observation Parent/patient education: Exercise care when eating not to further traumatize the injured teeth while encouraging a return to normal function as soon as possible To encourage gingival healing. Parents should clean the affected area with a soft brush or cotton swab combined with an alcoholfree 0.1%-0.2% chlorhexidine gluconate mouth rinse applied topically twice a day for 1 wk	 Clinical examination after: 1 wk 6-8 wk Where there are concerns that an unfavorable outcome is likely, then continue clinical follow up each year until eruption of the permanent teeth Radiographic follow up only indicated where clinical findings are suggestive of pathosis (eg, an unfavorable outcome) Parents should be informed to watch for any unfavorable outcomes and the need to return to the clinic as soon as possible. Where unfavorable outcomes are identified, treatment is often required The follow-up treatment, which frequently requires the expertise of a child-oriented team, is outside the scope of these guidelines 	Asymptomatic Pulp healing with: Normal color of the crown or transient red/gray or yellow discoloration and pulp canal obliteration No signs of pulp necrosis and infection Continued root development in immature teeth No disturbance to the development and/or eruption of the permanent successor	Symptomatic Signs of pulp necrosis and infection—such as: Sinus tract, gingival swelling, abscess, or increased mobility Persistent dark gray discoloration plus one or more signs of root canal infection Radiographic signs of pulp necrosis and infection No further root development of immature teeth Negative impact on the development and/or eruption of the permanent successor

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	Radiographic			Favorable and unfavorable outcomnot necessarily all, of the following:	Favorable and unfavorable outcomes include some, but not necessarily all, of the following:
Extrusive luxation	findings	Treatment	Follow up	Favorable outcome	Unfavorable outcome
	 A periapical (size 0 	 Treatment decisions are based on 	 Clinical examination after: 	 Asymptomatic 	Symptomatic
	sensor/film, paralleling	the degree of displacement, mobility,	- 1 wk	 Pulp healing with: 	 Signs of pulp necrosis and
5	technique) or occlusal	interference with the occlusion, root	- 6-8 wk	- Normal color	infection—such as:
	radiograph (size 2	formation, and the ability of the child to	-1 y	of the crown or	 Sinus tract, gingival
	sensor/film) should be	tolerate the emergency situation	 Where there are concerns 	transient red/	swelling, abscess, or
	taken at the time of	 If the tooth is not interfering with the 	that an unfavorable outcome	gray or yellow	increased mobility
Clinical findings: Partial	initial presentation for	occlusion—let the tooth spontaneously	is likely, then continue clinical	discoloration	 Persistent dark gray
displacement of the	diagnostic purposes and	reposition itself	follow up each year until	and pulp canal	discoloration plus one or
tooth out of its socket	to establish a baseline	 If the tooth is excessively mobile or 	eruption of the permanent	obliteration	more signs of root canal
 The tooth appears 	 Slight increase to 	extruded > 3 mm, then extract under	teeth	- No signs of pulp	infection
elongated and can be	substantially widened	local anesthesia	 Radiographic follow up only 	necrosis and	 Radiographic signs of pulp
excessively mobile.	periodontal ligament	 Treatment should be performed by a 	indicated where clinical	infection	necrosis and infection
Occlusal interference	space apically	child-oriented team with experience	findings are suggestive of	 Continued root 	 No further root
may be present		and expertise in the management of	pathosis (eg, an unfavorable	development in	development of immature
		pediatric dental injuries. Extractions	outcome)	immature teeth	teeth
		have the potential to cause long-term	 Parents should be informed 	 Realignment of the 	 No improvement in the
		dental anxiety	to watch for any unfavorable	extruded tooth	position of the extruded
		Parent/patient education:	outcomes and the need to	 No interference with 	tooth
		 Exercise care when eating not to 	return to the clinic as soon as	the occlusion	 Negative impact on the
		further traumatize the injured tooth	possible. Where unfavorable	 No disturbance to 	development and/or
		while encouraging a return to normal	outcomes are identified,	the development	eruption of the permanent
		function as soon as possible.	treatment is often required	and/or eruption	successor
		- To encourage gingival healing and	 The follow-up treatment, 	of the permanent	
		prevent plaque accumulation, parents	which frequently requires the	successor	
		should clean the affected area with a	expertise of a child-oriented		
		soft brush or cotton swab combined	team, is outside the scope of		
		with an alcohol-free 0.1%-0.2%	these guidelines		
		chlorhexidine gluconate mouth rinse			
		applied topically twice a day for 1 wk			

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	Radiographic			Favorable and unfavorable outcomes include some, but not necessarily all, of the following	nes include some, but not
Lateral luxation	findings	Treatment	Follow up	Favorable outcome	Unfavorable outcome
	 A periapical (size 0 sensor/film, paralleling 	 If there is minimal or no occlusal interference. The tooth should be 	 Clinical examination after: 1 wk 	AsymptomaticPulp healing with:	SymptomaticSiens of pulp necrosis and
	technique) or occlusal	allowed to spontaneously reposition	- 6-8 wk	- Normal color of the crown	infection—such as:
	radiograph (size 2	itself	- 6 mo	or transient red/gray or	- Sinus tract, gingival
4	sensor/film) should be	 Spontaneous repositioning usually 	- 1y	yellow discoloration and	swelling, abscess, or
	taken at the time of	occurs within 6 mo	 If repositioned and splinted, 	pulp canal obliteration	increased mobility
200	initial presentation for	 In situations of severe displacement, 	review after:	- No signs of pulp necrosis	- Persistent dark gray
	diagnostic purposes and	two options are available, both of	- 1 WK	and infection	discoloration plus one
	Increased periodoptal	Option A:	- 4 Wk lor spilit removal - 8 wk	 Continued root development in immature teeth 	or more signs or root canal infection
Clinical findings:		Extraction when there is a risk of	6 mo	Periodontal healing	Radiographic signs of pulp
The tooth is	(most clearly seen on	ingestion or aspiration of the tooth	- 1 y	 Realignment of the laterally 	necrosis and infection
displaced, usually	an occlusal radiograph,	Option B:	 Where there are concerns 	luxated tooth	 Ankylosis
ın a palatal/lıngual	especially if tooth is	 Gently reposition the tooth 	that an unfavorable outcome	 Normal occlusion 	 No further root
or labial direction	displaced labially)	 If unstable in its new position, 	is likely, then continue clinical	 No disturbance to the 	development of immature
I he tooth will be		splint for 4 wk using a flexible splint	follow up each year until	development and/or	teeth
		attached to the adjacent uninjured	eruption of the permanent	eruption of the permanent	 No improvement in
• Occiusal		teeth	teeth	successor	position of the laterally
Interference may		 Treatment should be performed by a 	 Radiographic follow up only 		luxated tooth
pe present		child-oriented team with experience	indicated where clinical findings		 Negative impact on
		and expertise in the management of	are suggestive of pathosis (eg,		the development and/
		pediatric dental injuries. Extractions	an unfavorable outcome)		or eruption of the
		have the potential to cause long-term	 Parents should be informed 		permanent successor
		dental anxiety	to watch for any unfavorable		
		 Parent/patient education: 	outcomes and the need to		
		 Exercise care when eating not 	return to the clinic as soon as		
		to further traumatize the injured	possible. Where unfavorable		
		teeth while encouraging a return to	outcomes are identified,		
		normal function as soon as possible	treatment is often required		
		 To encourage gingival healing and 	 The follow-up treatment, 		
		prevent plaque accumulation,	which frequently requires the		
		parents should clean the affected	expertise of a child-oriented		
		area with a soft brush or cotton	team, is outside the scope of		
		swab combined with an alcohol-	these guidelines		
		free chlorhexidine gluconate 0.1%-			
		0.2% mouth rinse applied topically			
		twice a day for 1 wk			

TABLE 11 Treatment guidelines for primary teeth: Intrusive luxation

	Radiographic recommendations			Favorable and unfavorable outcomes include some, but not necessarily all, of the following	rtcomes include some, but
Intrusive luxation	and findings	Treatment	Follow up	Favorable outcome	Unfavorable outcome
Clinical findings: Clinical findings: The tooth is usually displaced through the labial bone plate, or it can impinge on the permanent tooth bud almost or completely disappeared into the socket and can be palpated labially	A periapical (size O sensor/ film, paralleling technique) or occlusal radiograph (size 2 sensor/film) should be taken at the time of initial presentation for diagnostic purposes and to establish a baseline When the apex is displaced toward or through the labial bone plate, the apical tip can be seen and the image of the tooth will appear shorter (foreshortened) than the contralateral tooth When the apex is displaced toward the permanent tooth germ, the apical tip cannot be visualized and the image of the tooth will appear elongated	 The tooth should be allowed to spontaneously reposition itself, irrespective of the direction of displacement Spontaneous improvement in the position of the intruded tooth usually occurs within 6 mo In some cases, it can take up to 1 y A rapid referral (within a couple of days) to a child-oriented team that has experience and expertise in the management of pediatric dental injuries should be arranged Parent/patient education: Exercise care with eating not to further traumatize the injured tooth while encouraging a return to normal function as soon as possible To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcoholfree 0.1%-0.2% chlorhexidine 	Clinical examination after: 1 wk 6 -8 wk - 6 mo 1 y Further follow up at 6 y of age is indicated for severe intrusion to monitor eruption of the permanent tooth Radiographic follow up only indicated where clinical findings are suggestive of pathosis (eg, an unfavorable outcome) Parents should be informed to watch for any unfavorable outcomes and the need to return to the clinic as soon as possible. Where unfavorable outcomes are identified, treatment is often required The follow-up treatment, which frequently requires the expertise of a child-oriented team, is outside the scope of these guidelines	Asymptomatic Pulp healing with: Normal color of the crown or transient red/gray or yellow discoloration and pulp canal obliteration No signs of pulp necrosis and infection continued root development in immature teeth Periodontal healing Re-eruption/realignment of the intruded tooth Or disturbance to the development and/ or eruption of the permanent successor	Symptomatic Signs of pulp necrosis and infection—such as: - Sinus tract, gingival swelling, abscess, or increased mobility - Persistent dark gray discoloration with one or more signs of infection Radiographic signs of infection No further root development of immature teeth evelopment of immature teeth Ankylosis Negative impact on the development and/ or eruption of the permanent successor
		gluconate mouth rinse applied topically twice a day for 1 wk			

			Berrai Tradifiatorogy	**1
Favorable and unfavorable outcomes include some, but not necessarily all, of the following	Unfavorable outcome	Negative impact on the development and/or eruption of the permanent successor		
Favorable and unfavo some, but not necess	Favorable outcome	No signs of disturbance to development and/or eruption of the permanent successor		
	Follow up	 Clinical examination after: 6-8 wk Further follow up at 6 y of age is indicated to monitor eruption of the permanent tooth Radiographic follow up only indicated where clinical findings are suggestive of pathosis (eg, an unfavorable outcome) Parents should be informed to watch for any unfavorable outcomes are identified, soon as possible. Where unfavorable outcomes are identified, treatment is often required The follow-up treatment, which frequently requires the expertise of a child-oriented team, is outside the scope of these guidelines 		
	Treatment	Avulsed primary teeth should not be replanted Parent/patient education: Exercise care when eating not to further traumatize the injured soft tissues To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied topically twice a day for 1 wk		
Radiographic recommendations and	findings	A periapical (size 0 sensor/film, paralleling technique) or occlusal radiograph (size 2 sensor/film) is essential where the primary tooth is not brought into the clinic to ensure that the missing tooth has not been intruded or The radiograph will also provide a baseline for assessment of the developing permanent tooth and to determine whether it has been displaced		
	Avulsion	Clinical findings: The tooth is completely out of the socket The location of the missing tooth should be explored during the trauma history and examination, especially when the accident was not witnessed by an adult or there was a loss of consciousness. While avulsed teeth are most often lost out of the	mouth, there is a risk that they can be embedded in soft tissues of the lip, cheek, or tongue, pushed into the nose, ingested or aspirated. If the avulsed tooth is not found, the child should be referred for medical evaluation to an emergency room for	further examination, especially where there are respiratory symptoms

1.15 | Core outcome set

The International Association for Dental Traumatology (IADT) recently developed a core outcome set (COS) for traumatic dental injuries (TDIs) in children and adults.⁶⁵ This is one of the first COS developed in dentistry and is underpinned by a systematic review of the outcomes used in the trauma literature and follows a robust consensus methodology.⁶⁶ Some outcomes were identified as recurring throughout the different injury types. These outcomes were then identified as "generic" (ie, relevant to all TDIs). Injury-specific outcomes were also determined as those outcomes related only to one or more individual TDIs. Additionally, the study established what, how, when, and by whom these outcomes should be measured. Table 1 in the General Introduction section⁶⁷ of the Guidelines shows the generic and injury-specific outcomes to be recorded at the follow-up review appointments recommended for the different traumatic injuries. Further information for each outcome is described in the original article.⁶⁵

CONFLICT OF INTEREST

The authors declare there is no competing interest for the above manuscript. Images courtesy of the Dental Trauma Guide.

ETHICAL STATEMENT

No ethics approval was required for this paper.

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How to cite this article: Day P, Flores MT, O'Connell A, et al. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 3. Injuries in the primary dentition. *Dent Traumatol*. 2020;36:343–359. https://doi.org/10.1111/edt.12576