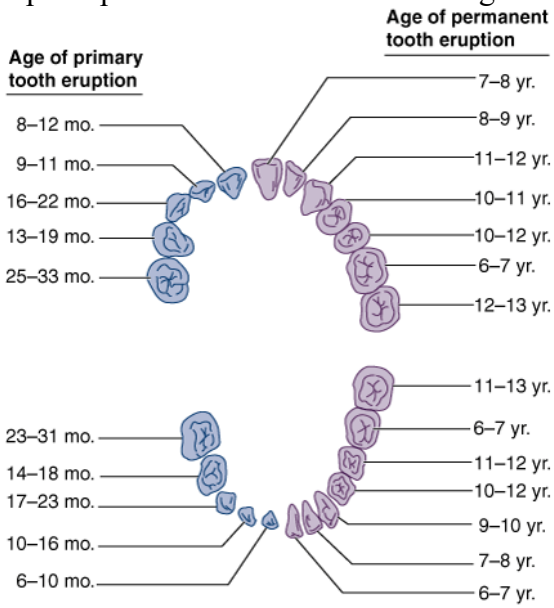
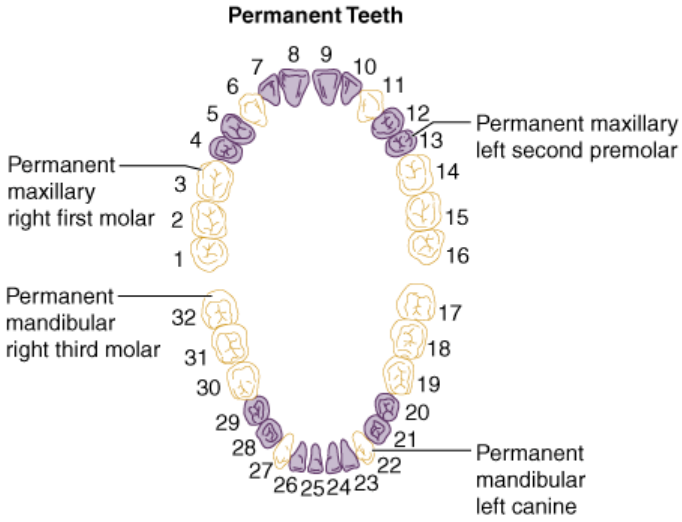
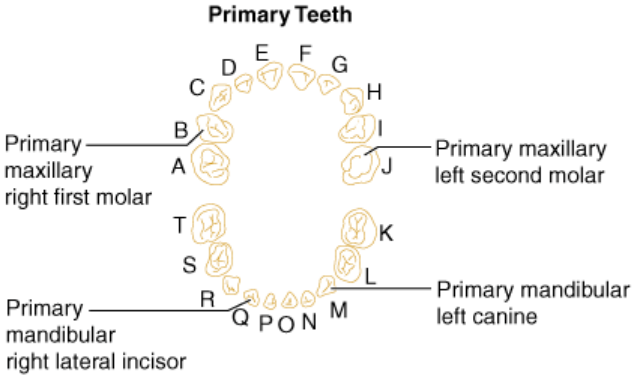
ORAL AND DENTAL EMERGENCIES

ORAL AND DENTAL ANATOMY:

- Normal adult dentition has 32 permanent teeth with 8 incisors, 4 canines, 8 premolars and 12 molars
- See below for eruption pattern of teeth and numbering of teeth by convention



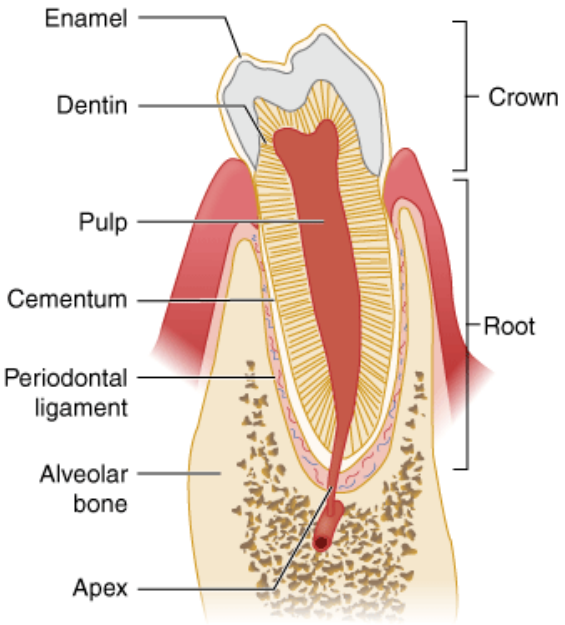




ANATOMY OF TEETH:

- A tooth is composed largely of DENTIN, which surrounds PULP (neurovascular supply)

- The CROWN is the visible portion of the tooth and consists of thick enamel overlying the dentin
- The ROOT, extends into the alveolar bone and is covered with a thin layer of CEMENTUM



- The terms used to describe teeth are outlined below:

Table 240-1 Commonly Used Dental Terminology	
Anatomically Descriptive Terms for Tooth Surfaces	
Interproximal	The surface between two adjacent teeth
Mesial	The interproximal surface facing anteriorly or toward the midline
Distal	The interproximal surface facing posteriorly or away from the midline
Occlusal	The chewing surface
Facial	Toward the face, a general term applicable to all teeth
Labial	Toward the lips, specific to the anterior teeth
Buccal	Toward the cheek, specific to the posterior teeth
Palatal	Toward the palate, specific to the maxillary teeth
Lingual	Toward the tongue, specific to the mandibular teeth
Apical	Toward the tip of the root of the tooth
Radicular	Associated with the root, especially the apical region
Coronal	Associated with the crown of the tooth
Incisal	Toward the biting edge of incisors
Cervical	Related to the junction of the crown and root of the tooth

THE NORMAL PERIDONTUM:

- Periodontum = the attachment apparatus and consists of a gingival component and a periodontal component
    - Periodontal component includes the periodontal ligament, alveolar bone and cementum of the root of the tooth
    - Gingival tissue is keratinised stratified squamous epithelium

OROFACIAL PAIN:

- COMMON CAUSES ARE OUTLINED BELOW:

Table 240-2 Differential Diagnosis of Orofacial Pain	
Odontogenic origin	
Dental caries	Pericoronitis
Reversible pulpitis	Postrestorative pain
Irreversible pulpitis	Postextraction discomfort
Pulpal necrosis and abscess	Postextraction alveolar osteitis
Dentinal sensitivity	Bruxism
Tooth eruption	Cervical erosion
Periodontal pathology	
Gingivitis	Periodontal abscess
Periodontal disease	Acute necrotizing gingivostomatitis
Orofacial trauma	
Dental fractures	Facial fractures
Subtle enamel cracks	Alveolar ridge fractures
Ellis fractures	Soft tissue lacerations
Dental luxation and avulsion	Traumatic ulcers
Infection	
Oral candidiasis	Hand-foot-and-mouth disease
Herpes simplex types 1 and 2	Sexually transmitted diseases
Varicella-zoster, primary and secondary	Mycobacterial infections
Herpangina	Mumps
Malignancies	
Squamous cell carcinoma	Leukemia
Kaposi sarcoma	Graft-versus-host disease
Lymphoma	Melanoma
Other etiologies	
Cranial neuralgias	Vesiculoulcerative disease
Stomatitis and mucositis	Lichen planus
Uremia	Cicatricial pemphigoid
Vitamin deficiency	Pemphigus vulgaris
Other	Erythema multiforme
Benign migratory glossitis	Crohn disease
Pyogenic granuloma	Behçet syndrome

PAIN OF ODONTOGENIC ORIGIN:

- TOOTH ERUPTION AND PERICORONITIS:
  - Commonly seen in infants (TEETHING) ➔ irritability, drooling and decreased intake
  - Associated low-grade fever and diarrhoea are more controversial
  - Eruption of permanent teeth, especially wisdom teeth (3rd molars) may cause pain
  - PERICORONITIS ➔ inflammation of the OPERCULUM (gingival tissue overlying the occlusal surface of the erupting tooth)
  - Because of the proximity of the masticator space to third molars, infection can supervene and cause trismus and this can extend into the parapharyngeal spaces ➔ PENICILLIN V500mg q6h as well as local irrigation of food and debris
    - With third molars, definitive treatment is extraction of the tooth
- DENTAL CARIES AND PULPITIS:

    - CARIES ➔ cause loss of integrity of dental enamel from hydroxyapatite dissolution by prolonged exposure to the acidic metabolic by-products of plaque bacteria
    - When a sufficient breach occurs, sensitivity to cold or sweet stimulus may result
    - Pulpal inflammatory process is initially reversible, but can be distinguished from irreversible pulpitis by duration of symptoms (irreversible lasts for hours) ➔ definitive treatment is root canal therapy or dental extraction
- PERIRADICULAR PERIODONTITIS:
    - Extension of PULP DISEASE, inflammation or necrosis into the tissues surrounding the root and apex of the tooth
    - PAIN ON PERCUSSION identifies the offending tooth
    - A small swelling of the gingival with a draining fistula adjacent to the affected tooth is known as a PARULIS (see below):

    - Erosion into the cortical bone can cause intraoral or facial swelling
    - Needs prompt root canal therapy
- FACIAL CELLULITIS:
    - Spread of odontogenic infections into the various facial spaces is relatively common
    - Cellulitis of bilateral submandibular spaces and the lingual space is called LUDWIG ANGINA and is potentially life threatening as these spaces communicate directly with the parapharyngeal space, AIRWAY COMPROMISE IS THE IMMEDIATE CONCERN
    - Infection of the infraorbital space can be devastating if RETROGRADE SPREAD through the ophthalmic veins occurs to involve the CAVERNOUS SINUS ➔ CAVERNOUS SINUS THROMBOSIS presents as an infraorbital or periorbital cellulitis with rapidly developing meningeal signs, sepsis and coma ➔ early identification and treatment with IV antibiotics is crucial in decreasing morbidity and mortality
- POST-EXTRACTION PAIN:
    - Pain in the initial 24-48 hours post extraction ➔ significant discomfort can occur
    - Best managed with ice packs, elevation of the head of the bed and oral analgesia

    - Trismus peaks in the first 24 hours and usually decreases thereafter unless infection supervenes
- POST-EXTRACTION ALVEOLITIS (DRY SOCKET):
    - Usually occurs on the second or third day post-operatively with EXQUISITE ORAL PAIN
    - Displacement of the clot in the socket results in exposure of the alveolar bone and initiates a localised osteomyelitis of the exposed bone
    - RF include smoking, preexisting pericoronitis or periodontal disease, traumatic extraction or prior history of alveolar osteitis
    - Higher incidence among impacted third molars
    - Obtain XR to rule out retained tooth
    - Irrigate dental socket with sterile normal saline, remove excess fluid and pack space with gauze
    - Antibiotics (Penicillin V) is indicated in most cases
    - Refer within 24 hours
- POSTEXTRACTION BLEEDING:
    - Common problem
    - Generally, firm pressure applied to the extraction site is adequate to control bleeding ➔ achieved by clenching on gauze (NOT CHEWING) for 20 minutes
    - Can use absorbable gelatin (e.g. surgical) or suture if still struggling ➔ do not suture gingival tightly because this may cause necrosis of the gingival flap

PERIODONTAL PATHOLOGY:

- PERIODONTAL ABSCESS:
    - When plaque and debris are entrapped, a periodontal abscess may form, resulting in severe pain
    - Normally responds to local therapy with warm saline rinses and antibiotics (penicillin V)
    - Larger abscesses may require incision and drainage
- ACUTE NECROTISING ULCERATIVE GINGIVITIS:
    - AN AGGRESSIVELY DESTRUCTIVE PROCESS aka TRENCH MOUTH OR VINCENT DISEASE

    - Part of a spectrum of disease, characterised by a triad of ULCERATED “PUNCHED OUT” INTERDENTAL PAPILLAE, PAIN and GINGIVAL BLEEDING

    - Secondary signs ➔ fetid breath, pseudomembrane formation, "wooden teeth" sensation, foul metallic taste, tooth mobility, fever/malaise
    - Differential is quite extensive but HERPES GINGIVOSTOMATITIS is the most difficult to differentiate (this usually has smaller vesicular eruptions, with less bleeding and more systemic signs with lack of interdental papilla involvement
    - THE CAUSE IS STILL POORLY UNDERSTOOD → appears to be an opportunistic infection in a host with lowered resistance which results in an aggressively destructive disease process
    - HIV is the most important predisposing factor, but others include:
        - Poor oral hygiene
        - Unusual emotional stress
        - Poor diet
        - Malnutrition
        - Inadequate sleep
        - Caucasian descent
        - Age <21
        - Alcohol and tobacco use
    - Treatment ➔ BACTERIAL CONTROL with chlorhexidine oral rinses bd, professional debridement and scaling and adjunctive oral antibiotics (metronidazole 400mg tds)
- FACIAL NEURALGIAS:
    - TRIGEMINAL NEURALGIA IS THE MOST COMMON → very painful, commonly affects people aged 30-60, more females (60%). Almost always unilateral, with maxillary branch most commonly affected, recurrent episodes of electric shocklike paroxysmal pain of short duration
        - Associated contraction of the facial muscles (TIC DOLOREUX) is common
        - Physical stimulation of a trigger point is the inciting event in most cases
        - Pathogenesis is still uncertain but requires exclusion of organic pathology such as acoustic neuroma, cerebral aneurysm, nasopharyngeal carcinoma
        - Referral to a neurologist is important
        - Trial of carbamazepine 100mg bd, gabapentin, amitryptiline is worthwhile

SOFT TISSUE LESIONS OF THE ORAL CAVITY:

ORAL CANDIDIASIS:

- Commonly affects the oral cavity
- Risk factors ➔ extremes of age, dentures, malnutrition,concurrent infections, antibiotics, AIDS
- Lesions ➔ most common is THRUSH ➔ white, curd-like plaques, easily scraped off to reveal an underlying erythematous mucosal base
- Treatment is topical oral antifungal agents ➔ NYSTATIN ORAL SUSPENSION or systemic agents such as FLUCONAZOLE

APHTHOUS STOMATITIS:

- Aka ulceration, one of the most common oral lesions, affecting ~20% of the normal population

- THREE FACTORS PREDISPOSE:
  - Immune imbalance
  - Breach in the mucosal barrier
  - Allergic response
- Painful, frequently multiple and usually resolve spontaneously in 10-14 days
- Treatment ➔ topical betamethasone syrup and analgesia

HERPES SIMPLEX:

- Type one most commonly affects the oral cavity, but type 2 (genital) can affect the mouth also
- Herpes gingivostomatitis causes acute painful ulceration on the gingival and mucosal surfaces
- Vesicular lesions appear and rupture after 1-2 days, leaving painful ulcers
- Treatment ➔ adequate pain relief to ensure oral hydration, if severe give ACYCLOVIR 75mg/kg/day in five divided doses for 7 days
- Secondary infcction can complicate
- Periodic stresses activate the dormant virus and result in recurrent lesions along the sensory distribution of the nerve ➔ preceded by a prodrome of burning or tingling 1-2 days prior to appearance of the lesion ➔ acyclovir at this time can lessen the severity and duration of ulceration

VARICELLA ZOSTER:

- OCCURS ALONG THE DISTRIBUTION OF THE TRIGEMINAL NERVE 15-20% OF THE TIME
- Vesicular eruptions typically occur unilaterally, don’t cross the midline and last 7-10 days
- Involvement of the ophthalmic branch of the trigeminal nerve requires urgent ophthalmic consultation

HERPANGINA:

- Most commonly caused by coxsackie virus group A

- Sudden onset high fever, sore throat, headache and malaise followed by eruption of oral vesicles that leave numerous shallow, painful ulcers over the soft palate, uvula, posterior pharynx and tonsillar pillars
- Treatment is supportive ➔ consider xylocaine viscous for symptomatic relief for kids

HAND-FOOT-AND-MOUTH DISEASE:

- Coxsackie A16
- This entity is characterised by development of a few small vesicles on the tongue, gingival, soft palate and buccal mucosa
- These vesicles rupture leaving shallow ulcers with a red halo
- Buttocks, palms, plantar surfaces may be affected
- Treatment is supportive

TRAUMATIC ULCERS AND PYOGENIC GRANULOMA:

- Traumatic ulcers are a result of direct trauma to epithelial tissue, removal of sources of trauma is essential, but treatment is otherwise supportive
- A pyogenic granuloma is a common, benign proliferation of connective tissue in response to local trauma or irritation

- Can occur in pregnancy
    - If the tumour does not regress 2-3 months post-partum, definitive removal is indicated

MEDICATION-RELATED SOFT TISSUE ABNORMALITIES

- GINGIVAL HYPERPLASIA
    - Can occur in 50% of patients on phenytoin
    - CCB (especially nifedipine), cyclosporine also implicated
    - Clinical appearance depends on oral hygiene and secondary inflammation

- Treatment includes fastidious oral hygiene to slow the hyperplasia and gingivectomy in advanced cases

SEXUALLY TRANSMITTED DISEASES:

- With oral-genital contact, the oral mucosa is as susceptible to the transmission of STD as the urogenital mucosa
  - Gonorrhoea can commonly cause a pharyngitis with or without pustules on the uvula or tonsils
  - Oral HSV-1 and 2 are clinically indistinguishable
  - The primary chancre of syphilis can occur orally (most commonly on the lip)
- Treatment is the same for oral as urogenital STD

LESIONS OF THE TONGUE:

- Many systemic conditions, various vitamin deficiencies and iron deficiency can cause atrophy of the filiform papillae ➔ smooth erythematous appearance
- BENIGN MIGRATORY GLOSSITIS:
  - Aka GEOGRAPHIC TONGUE
  - Typically multiple, well-demarcated zones of erythema on the tongue caused by atrophy of the filiform papillae
  - Common finding (1-3% of the population, females twice as frequently as men)
- STRAWBERRY TONGUE:
  - Associated with erythrogenic toxin-producing STREPTOCOCCUS PYOGENES
  - Prominent red spots on white-coated background
- LEUKOPLAKIA AND ERTHROPLAKIA:
  - Leukoplakia ➔ white patch or plaque that cannot be scraped off. Common oral precancerous lesion. Can involve buccal mucosa
    - Biopsy is mandatory for all persistent leukoplakia
  - Erythroplakia ➔ red patch that similarly cannot be clinically or pathologically classified as any other disease. Greater potential for dysplastic change

ORAL CANCER:

- Accounts for 2-4% of all cancer
- More than 90% of all oral malignancies are SCC
- Extrinsic RF ➔ tobacco use (especially chewing tobacco), excessive alcohol consumption, sunlight
- Intrinsic RF ➔ general malnutrition and chronic iron-deficiency anaemia
- Most common site is THE TONGUE, especially posterolateral border

- Signs and symptoms listed below ➔ generally painless and patients are often unaware until it is advanced

Table 240-3 Signs and Symptoms of Oral Cancer
Signs
Nonhealing ulcer: can be in form of crater with elevated, indurated margins
Bleeding: resulting from ulcerations
Lymphadenopathy
Rigidity: lesions fixed to surrounding tissue
Induration: hardness of the lesion
Functional interference: such as speech and mastication
Symptoms
Pain
Secondary to ulceration
Secondary to trauma related to functional interferences
Paresthesias
Drooling: secondary to functional interferences

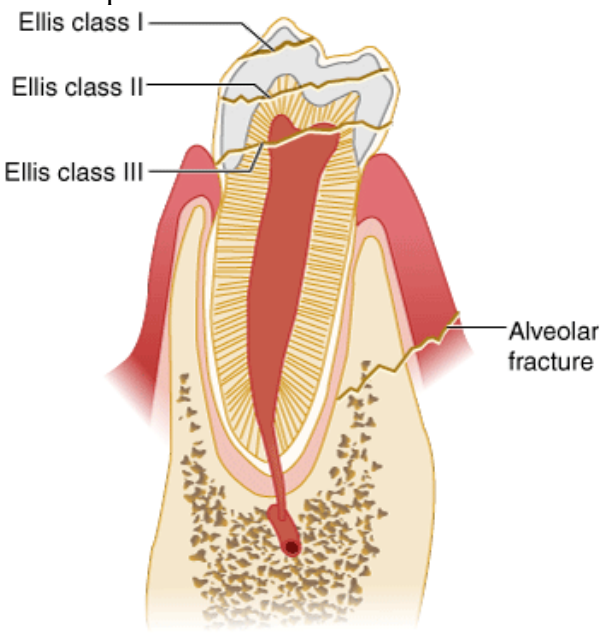
- All ulcers, erythroplakic and leukoplakic lesions that do not respond to palliative treatment in 10-14 days warrant biopsy

<u>OROFACIAL TRAUMA:</u>

DENTOALVEOLAR TRAUMA:

- Management of this variety of trauma depends on the extent of tooth and alveolar involvement and degree of development of the apex of the tooth and the age of the patient

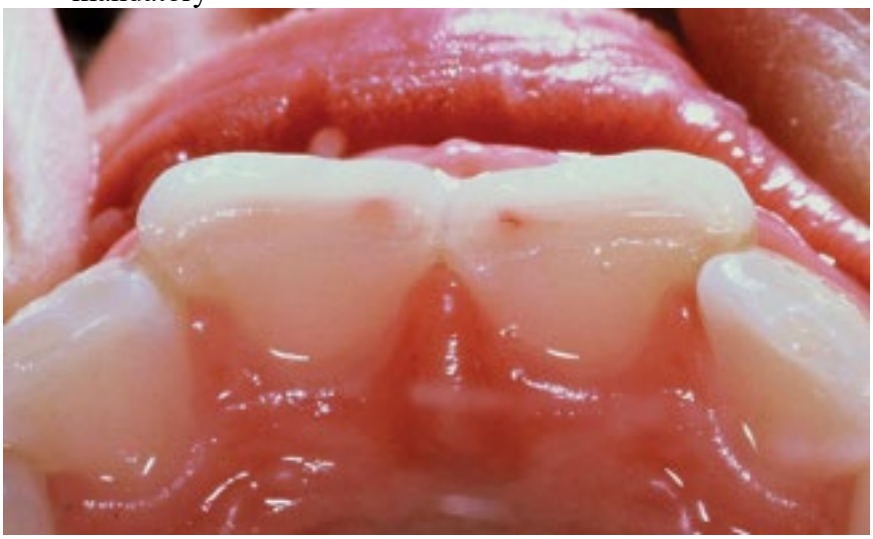
- DENTAL FRACTURES:
  - ELLIS CLASSIFICATION:
    - Simple classification structure



  - Goal of emergency treatment of a fractured tooth is maintaining pulpal vitality
  - The proximity of the fracture to the pulp and the length of time before treatment are most important in determining outcome
  - Treatment is aimed at sealing the dentinal tubules and creating a barrier between the dental pulp and oral environment
  - In properly treated dental fractures, only 1-2% undergo necrosis
  - ELLIS CLASS I ➔ involve enamel portion of the tooth only and no emergency treatment is indicated, dentistry referral for cosmetic reasons

  - ELLIS CLASS II ➔ involve the dentin of the tooth and require intervention. Constitute 70% of dental fracture. Can be identified by

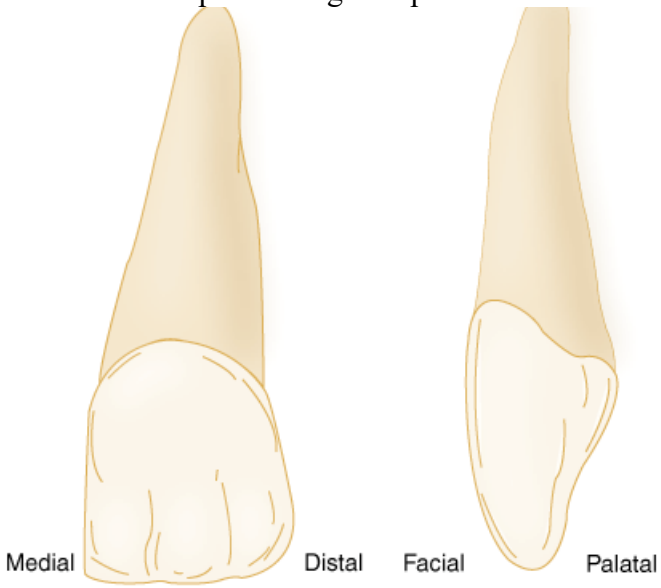
the patient's symptoms (hot/cold sensitivity) and visualisation of exposed dentin, which is creamy yellow in colour compared with whiter enamel. Greater than 2mm of remaining dentin is felt to offer some protection to the pulpal tissue. Delay in treatment increases the likelihood of pulpal necrosis. AIM IN ED IS TO RECOGNISE, BUT ALSO TO COVER EXPOSEED DENTIN TO DECREASE PULPAL CONTAMINATION ➔ use dental cement. Follow up in 24 hours is mandatory



- ELLIS CLASS III ➔ exposre of pulp has occurred. After wiping tooth with sterile gauze, blood emanating from the pulp is easily recognised. Attempt to cover exposed pulp with a calcium hydroxide base. Prompt appropriate treatment lessens the likelihood of pulpal necrosis by minimising pulpal contamination. Needs endodontic root canal therapy
- ROOT FRACTURES ➔ 5-7% of all injuries. Aim is to reposition the coronal segment, confirm position on XR and stabilise with a flexible splint and refer to a dentist within 24 hours

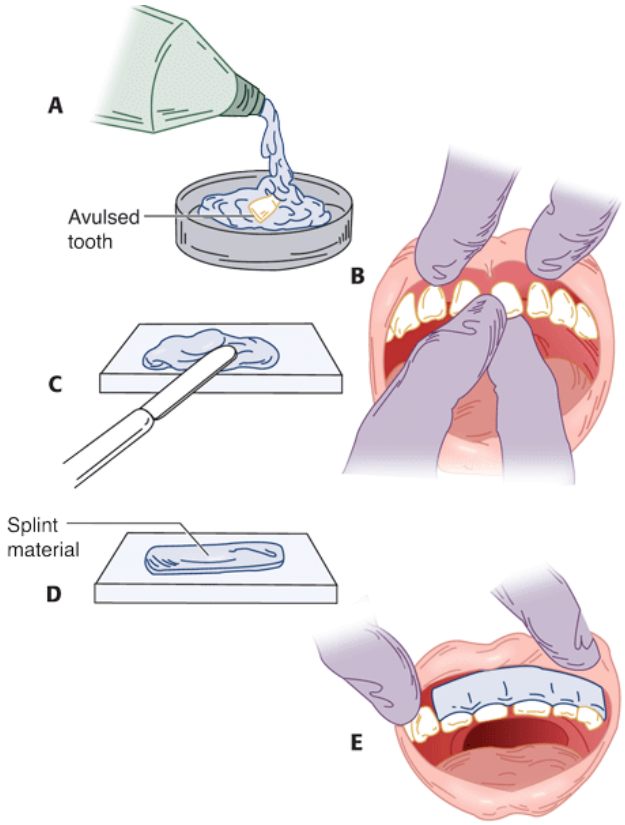
- **CONCUSSION, LUXATIONS AND AVULSIONS:**
  - Careful evaluation for tenderness, malpositioning or mobility must be performed
  - CONCUSSIONS:
    - Injury to supporting structures with tenderness BUT NO MOBILITY
    - Management of pain is paramount
  - LUXATIONS:
    - SUBLUXATION ➔ mobility without radiographic evidence of dislodgment. More significant injury, higher incidence of pulpal necrosis but does not need splinting. Refer to dentist.
    - EXTRUSIVE LUXATION ➔ partial avulsion or dislodgment of a tooth from the alveolar bone. Requires repositioning, usually with firm, gentle pressure. Apply flexible wire splint.
    - LATERAL LUXATION ➔ displacement of a tooth laterally with concomitant alveolar bone fracture. Represents a more extensive injury and fracture of surrounding alveolar bone. Repositioning is generally more difficult. Dental referral for intra-arch stabilisation

        - INTRUSIVE LUXATION ➔ displacement of a tooth into its socket with associated alveolar fracture. MOST SERIOUS because significant damage to the alveolar socket and periodontal ligament occurs. Root resorption is common as a result of damage to periodontal ligament. Recommendation is to allow tooth to erupt on its own or by orthodontic intervention if it has not done so by 3 weeks.
    - AVULSIONS:
        - TOOTH REIMPLANTATION AND CARE AT THE SCENE:
            - Avulsion = total displacement of a tooth from its sock and accounts for 16% of all injuries to teeth
            - REIMPLANT AVULSED PERMANENT TEETH AS SOON AS POSSIBLE (if possible within 2-3 hours)
            - Rinse the tooth with sterile saline, handle only the crown and replace it into the socket
            - See below for incisor appearance to assist repositioning/reimplantation



            - Early improper reimplantation holds a higher success rate for tooth salvage than delayed reimplantation while waiting for expert care!
            - Transpont in isotonic solutions if possible (HANK'S SALT SOLUTION) but if not available ➔ milk, sterile saline and saliva
            - If the avulsed tooth is not recovered, CXR to ensure it has not been aspirated
        - TOOTH REIMPLANTATION IN ED:
            - Rinse tooth clean of dirt and debris with sterile saline
            - Do NOT SCRUB THE ROOT OF THE TOOTH AND HANDLE ONLY THE CROWN
            - If an avulsed tooth with an open apex has been dry for <20 minutes, prognosis is good. If it has been dry 20-60 minutes, soak in Hank's solution while preparing for reimplantation

- Reimplantation is accomplished with firm pressure
- Stabilise as shown below:



- Antibiotics (doxycycline is preferred, penicillin V if <12)
- Soft diet for two weeks, brush carefully with soft tooth brush and use chlorhexidine mouthwash

▪ SEQUELAE OF TOOTH AVULSION:
- Pulp canal obliteration, pulpal necrosis, internal external resorption of the root and ankylosis may occur
- More than 50% of extrusively luxated teeth undergo pulpal necrosis within 1.5 years of the traumatic event
- Associated alveolar ridge fracture is common

▪ AVULSION OF PRIMARY TEETH:
- Treated very differently
- Avulsed primary teeth ARE NEVER REIMPLANTED
- In patiens aged 6-12, dentition is mixed, so it is vital to distinguish primary from permanent teeth
- Intruded primary teeth are an exception and are generally left alone to re-erupt into a normal position
- Follow up with a dentist is essential

SOFT TISSUE TRAUMA:

- ORAL CAVITY MUCOSAL LACERATION:
  - Large intraoral lacerations (>1cm) are susceptible to ulceration and secondary infection and tend to heal in a fibrotic mass
  - Carefully inspect for foreign material, including tooth fragments and irrigate the lacerations well with sterile saline

        - Retained foreign bodies serve as a nidus for infection
        - Close approximation of the wound rather than a tight tissue seal is desired to allow drainage
        - Place the sutures so the knots are buried and use absorbable sutures
- TONGUE LACERATIONS:
    - Approximate the wound edges on the dorsum of the tongue very precisely, because if the edges are not well approximated, the epithelia will migrate downward and will result in an epithelial cleft with a bifid appearance ➔ has cosmetic and functional implications
- LIP LACERATIONS:
    - Potential cosmetic problem
    - In lacerations involving the vermilion border, alignment of the border is important and the border should be sutured first
    - Remove sutures early (within five days), so as to decrease iatrogenic scarring
- FRENULUM LACERATIONS:
    - Laceration of the maxillary labial frenulum, unless unusually large, does not require repair