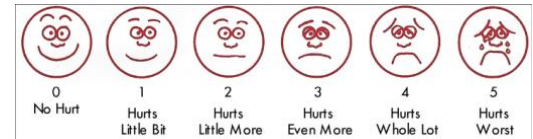


Behaviour management

- Behaviour: result of an individual's reaction to his/her environment. It depends on:
 - Temperament – relaxed, high strung, moody, adaptable, etc
 - Attachment – authoritarian, permissive, or completely detached parenting?
 - Fears – depends on child's stages of development
 - Cognitive development – depends on child's stages of development
- Factors that influence dental fear
 - Past experiences
 - Parental fears and anxieties
 - Genetic predisposition (Redheads have variants of MC1 receptor → higher dental fear/pain)
- Assessment of child's behaviour
 - Self assessment
 - Wong-Baker pain scale: child points at picture that represents their feeling
 - Dentist assessment
 - Thorough history taking:** past experiences at the hairdresser, other medical professions, how they perform during immunizations, physical protest
 - Frankl scoring:** scores are given on a scale of 1~4
 - 1 "Definitely Negative": Refusal of treatment, crying, and extreme negative behaviour
 - 2 "Negative": Reluctance to accept treatment eg sudden withdrawal of treatment.
 - 3 "Positive": Acceptance of treatment but cautiously and with reservation
 - 4 "Definitely Positive": Good cooperation, allows treatment, and extreme positive behaviour
- Guiding a child's behaviour – non pharmacological



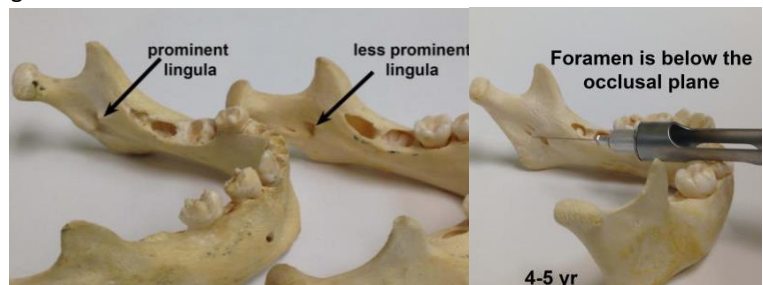
Communicative	Tell-show-do	-Effective for most children, even those <3 years old -Removes anxiety of not knowing what is happening -Demonstrate the action on <u>someone or something else</u> -Demonstrate on the child, but not the full procedure -Then, proceed with full procedure -Let child touch and play with instruments
	Voice control	-Highly effective for disruptive children -Some parents may not like it – inform beforehand -Positive reinforcement on actions, not saying "DON'T do that" -Talk gently into ear and remain calm
	Positive reinforcement	-Rewards can be things like thumbs up, or physical (stickers, stamps, prizes) -Immediate reinforcement is best, and small improvements are worthy of rewards -Be consistent
	Non-verbal	-Make eye contact when talking and giving instructions -Introduce yourself without loupes, and show child why you will be wearing them -Avoid sudden unexpected movements -Smile and have a positive demeanour
	Distraction	-Direct attention away from the procedure using audio or visual distractions -Affects perception of pain and discomfort -Child needs to be cognitively advanced enough for distraction -Highly supported by evidence that this is an effective method
Parental	Presence or absence	-Could be detrimental or beneficial – be flexible -Explain to the parents that they may have to leave the room if needed -By default, parent should be in the room. They can be coached on what to say and what not to say -Tell parent not to say "you are almost done"
Physical methods	Restraints	-Pedi-wrap, papoose board, blanket -Need informed consent from the parent. Show and explain the methods to parent
	Mouth props	-2 types at UBC: McKesson (traditional) and Molt (scissor-like device) -Molt is less bulky in the mouth and gives more control of position
	Nitrous oxide	-Inhaled nitrous oxide and oxygen mixture -Anxiolysis, mild analgesia, and mild CNS depression

Local anesthesia

- Recommended maximum doses of LA's with vasoconstrictor
 - These are Canadian guidelines
 - May differ from American guidelines
- Calculating dose for a 15 kg child
 - Lidocaine 2% = 0.02 g/mL = 20 mg/mL
 - $7\text{mg/kg} \times 15\text{kg} = 105\text{ mg}$ maximum dose
 - $105\text{mg} / (20\text{mg/mL}) = 5.25\text{ mL}$ of lidocaine 2%
 - $5.25\text{mL} / 1.8\text{mL} = 2.9$ cartridges maximum
- Adverse reactions to LA
 - Allergic reaction
 - Esters
 - Metabisulphite
 - True amide allergy is very rare (Lidocaine is an amide anesthetic)
 - Methylparaben (no longer added to dental LA)
 - Overdose toxicity
 - Mild: lightheadedness, diplopia, slurred speech, sensory disturbance, sedation, disorientation, twitches
 - Moderate: tremors, respiratory depression, seizures
 - Severe: respiratory arrest, cardiovascular collapse
 - Others: syncope, nausea and vomiting

Drug	Maximum dose
Articaine	7 mg/kg (up to 500 mg) 5 mg/kg in children
Bupivacaine	2 mg/kg (up to 200 mg)
Lidocaine	7 mg/kg (up to 500 mg)
Mepivacaine	6.6 mg/kg (up to 400 mg)
Prilocaine	8 mg/kg (up to 500 mg)

- Mandibular blocks
 - Depending on child, some may have prominent lingulas and others may not
 - Prior to injection, you can palpate the lingula area with your thumb
 - Approach needle from contralateral molar and aim slightly lower than in an adult
 - For children <5, foramen is below the occlusal plane
 - Advance needle 20 mm → give 1/3 carp
 - Withdraw needle a bit, but still keep tip in tissue
 - Aim 10-15° closer to midline and reinsert → give 2/3 carp
 - Then, give long buccal infiltration
 - This method ensures you will hit the IAN whether they have a prominent lingula or not
- Maxillary blocks

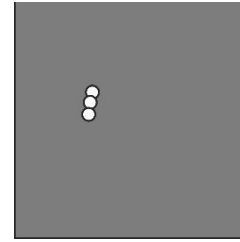


- Maxillary blocks
 - Apices of maxillary molars are very high in the sulcus
 - Place tip of needle on vestibule
 - Pull the vestibule over the needle and inject a few drops → anesthetizes the periosteum
 - Insert needle until periosteum is felt → give rest of infiltration
 - Proceed with palatal injection



Restoration of primary teeth

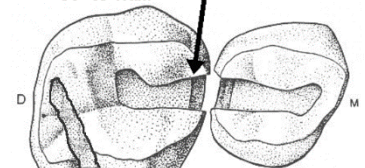
- Isolate with rubber dam
 - Clamps for D's: 1A, 2, 2A
 - Clamps for E's: 8A, 1A, 2, 2A
 - Clamps for 6's: 14A, 14, 8A (if tooth is small)
 - Punch in a straight line as seen in the grid on the right →
 - Make sure dam is not blocking nose
- Class 2 restoration
 - Instrumentation
 - High speed: #330 (carbide or diamond), #169 (to straighten walls)
 - Slow speed: #4 round bur (for internal bevel of PA line angle), #34 inverted cone
 - Hand: small pluggers, burnishers, carvers, spoon excavators, Howe pliers
 - Anatomical differences and modifications needed to prep design



Thinner enamel and dentin	-Shallower and narrower preps -Pulpal axial bevel to give bulk to amalgam
Pulp horns closer to DEJ	-Preps must be shallow
Large cervical bulge	-If proximal box goes below bulge, it will result in a very narrow gingival floor and possible pulp exposure -Flare of proximal box is directly related to narrow occlusal table and much wider cervical region
Enamel rods always slops occlusally	-No need to bevel gingival floor
Broad proximal contact area	-Proximal box must be flared to include entire contact
D's have narrow occlusal tables	-MOD amalgams invariable fail on D's -Narrow Bu-Li prep in proximal boxes -Bu-Li prep in occlusal slot 1/2 to 1/3 of intercuspal width
Gingiva comes up to proximal contact	-Any proximal prep will be subgingival by definition -Protect gingiva with rubber dam and wedges

- Preparation design
 - Occlusal slot
 - Start at central groove and extend into all fissures
 - Keep slot centred (Bu-Li) in the tooth
 - 1~1.5mm deep
 - No reverse S when extending into the proximal box** (tooth is too narrow)
 - In mandibular D's: don't touch transverse ridge due to a pulp horn being underneath
 - Should be occlusally convergent with slight undercut **except at the ends of fissures, where there should be no undercut**
 - Proximal box
 - Should be 1/3 to 1/2 intercuspal width
 - Move the bur like a pendulum and progress gingivally until contact is broken
 - Take care not to undermine the marginal ridge
 - Bevel the pulpal axial line angle → amalgam strength and reduce stress on tooth edge**
 - Contact should barely be broken (only tip of explorer fits)
 - Going more gingivally → wider axial wall → more risk of pulp exposure
 - Proximal box is also occlusally convergent

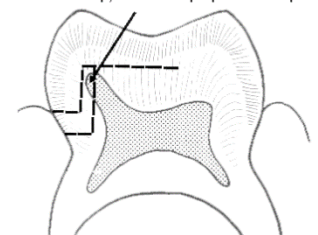
No reverse S. Keep walls straight and cavosurface margin should be 90° to wall.



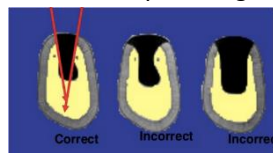
Don't cross the transverse ridge on mandibular D's.



Axial wall depth cannot be too deep, otherwise pulp will be exposed.



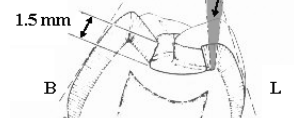
Dropping gingival floor too far below contact causes the gingival seat to be too narrow



Bevel pulpal axial line angle



Flare bur at the ends of the fissures.



- Restoration
 - Matrix band
 - Don't use Tofflemire because they leave excess amalgam to carve
 - Matrix bands adapt better to the bulging anatomy of primary teeth
 - Use a T band: wrap T band around tooth → pull tight and fold it → remove T band from tooth → fold another 0.5mm shorter → put it back on tooth
 - Should extend 1mm above marginal ridge and just below gingival floor
 - Ensure good adaptation using wedges. Use on side needing more support
 - Packing and carving
 - Pack the proximal boxes first
 - Cavity should be filled with at least 3 increments of amalgams
 - If 2 preps are adjacent to each other, fill them together so one resto doesn't bulge into the other
 - Restore contacts if they were there previously
 - When occlusal anatomy is all carved, unwind the T band and pull it out buccally
 - When the T band is out, the wedge can be removed too
 - Don't pull T band occlusally as it may break amalgam restoration
- Common reasons for failure
 - Fracture at isthmus due to narrow isthmus and insufficient bulk
 - Marginal failure in proximal box due to excessive flare of cavosurface margin
 - Recurrent caries if restoration is not extended adequately
 - Shallow cavity preparation and failure to bevel pulpal axial line angle leading to fracture
 - Overextending cavity prep beyond line angles
- Changes to restoration if material was composite
 - Depth is the same (0.5mm into dentin)
 - Cavosurface bevel and gingival bevel, unlike no bevel in amalgam
 - No occlusal dovetail needed provided adjacent fissures are sealed
- Clinical criteria marking form

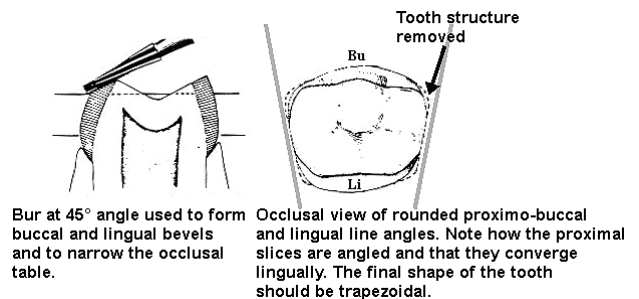
Assessment Category	Assessment Criteria
A Preparation	Occlusal outline extended to all affected area or appropriate occlusal dovetail placed (5)
	Occlusal isthmus 1/3-1/2 of intercuspal width and centered in the tooth (5)
	Pulpal and axial depth = 1-1.5 mm (5)
	Gingival, buccal and lingual extension of box beyond contact area (5)
	Convergent buccal and lingual walls in the proximal box. (5)
	Smooth floors throughout (5)
	All unsupported enamel at cavosurface margins removed (5)
	All internal line angles rounded including bevel of pulpal axial line angle(5)
B Isolation	Appropriate size rubber dam clamp (1)
	Appropriate rubber dam isolation (2)
	No damage to adjacent teeth (2)
D professionalism	Independence, time management, professionalism, preparation (5)
Marks total/grade	Out of a total of 50
Critical errors which require repeat of preparation	
<ul style="list-style-type: none"> • Depth greater than 1.5 mm • Occlusal slot too wide, not centered • Proximal box over- extended, includes line angle • Damage to adjacent teeth • Lack of rubber dam isolation 	
Errors that can be fixed	
<ul style="list-style-type: none"> • Rough internal surfaces • Isthmus too narrow • Box under extended, not into self cleansing area • Lack of bevel on pulpal axial line angle • Incomplete extension of occlusal slot into fissures 	

Assessment Category	Assessment Criteria
A) Restoration (amalgam condensation and carving)	Occlusal carving (recaptures main features, not too deep)
	Marginal ridge (rounded, not ditched)
	Cavosurface margins (fully closed, absence of flash, open margins)
	Finishing (smooth surface, can use a cotton pellet to smooth off surface)
	proximal box (overhangs?)
B) Occlusion	Occlusion checked
	Occlusal interferences
	Application of Knowledge
	Organization, Time management and infection control
	Degree of independence
Marks total/grade	

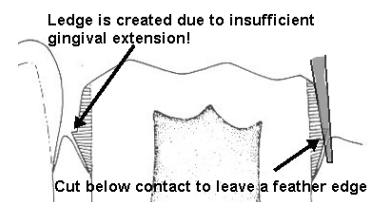
- Stainless steel crowns
 - Indications for a SSC
 - Gross or rampant caries (interproximal caries that extends beyond line angles)
 - Fractured teeth
 - Failed amalgam restoration
 - Hypoplastic enamel (especially in permanent molars)
 - Developmental defects of enamel or dentin, unusual anatomy, or compromising rotation
 - Poor oral hygiene/ high caries rate elsewhere in the mouth.
 - Difficult behaviour to manage means that a more robust restoration may be required.
 - To restore a tooth after performing a pulpotomy/ pulpectomy
 - To act as an abutment for a space maintainer
 - Interim restoration for compromised permanent molars in preteen and teenage kids (until a traditional crown preparation can be accomplished)
 - Instrumentation
 - Tapered diamond 5858, football diamond 5378, contouring/crimping pliers, Howe pliers, bite stick
 - Anatomical differences and modifications needed to prep design

Large mesiobuccal bulge on mandibular D	-Main source of retention for 3M stainless steel crown -Better to leave this MBu bulge alone -Crown can be crimped to increase retention
Occlusal height is shorter	-Do not over reduce occlusal -Reduction maintains general anatomy: central groove is still deep and cusps are still high
Trapezoidal occlusal shape (wide buccal, narrow lingual)	-Maintain morphology when doing proximal cuts
SSC's have no finish line	-Avoid creating ledges in crown prep -Make a feather margin around the tooth
D's have narrow occlusal tables	-SSC are more successful than MOD's -Reducing the occlusal table will pull cusp tips more bucco/lingually → bevel the occlusal surface to bring cusp tips closer to center of tooth
Gingiva comes right up to proximal contact	-SSC will have to be slightly subgingival -Protect gingiva with rubber dam and wedges

- Preparation design
 - Occlusal reduction 1.5mm below adjacent tooth using football diamond
 - Bevel buccal and lingual line angles
 - Feather edged interproximal reduction
 - Round off all internal line angles
 - It is much easier to do interproximal reduction after occlusal has been done



- Crown adaptation
 - Seat the crown from lingual to buccal
 - Crown margin should be 1~1.5mm subgingival
 - Should not rock, displace, or rotate easily. Should need an instrument to remove, not fingers
 - Good occlusal contact with opposing arch
 - Marginal ridges should line up and form contacts with adjacent teeth
 - Gingival margin of SSC can be crimped to get better adaptation



- Cementation
 - Use GIC luting cement
 - Fill ½ the SSC (you are using a lot because you need to fill in the 1.5mm occlusal reduction gap)
 - Dam may need to be removed for better fit
 - Use bite stick to seat crown fully
 - Clean of excess cement with water rinse and floss before it sets

- Reasons for failure of SSC
 - Crown too large for tooth
 - If a large crown is placed on an E this may lead to impaction of 6's
 - In a crowded dentition, maxillary 6's have a more pronounced mesial angulation, resulting in resorption of the distal root of the E's. This is also known as Ectopic Eruption.
 - Pulp necrosis (over-reduction → pulp exposure, especially MBu on mandibular D's)
 - Space loss due to placing a smaller crown and not restoring contact
 - Crown "worn through" due to high occlusion, or just being in the mouth a long time
 - Small perforations may be restored with a thick mix of GIC or with amalgam.
 - Localized gingivitis due to failure to remove cement or crown length too long.
 - Recurrent caries under crown (rare unless crown is not covering entire carious lesion).
 - Loss of SSC due to insufficient mechanical retention
 - Usually due to too much tapering and removal of the Mbu bulge
 - **Crown loss is NOT due to failure of the cement but rather inadequate adaption**
 - **ie. usually crown size selected is too large for the prep**
- Types of pediatric crowns at UBC

3M	Unitek
-Pre contoured and bulging -Pre trimmed (sloped buccally and curved in col area) -Pre crimped -Pre-thinned at gingival margin -Fit most primary molars easily -May be difficult in cases with space loss	-Untrimmed -Uncontoured -Uncrimped -Require more manipulation prior to seating -In patient, trim → contour → crimp -Gingival margin will need to be thinned and crown polished before seating

Assessment Category	Assessment Criteria
A preparation	Adequate occlusal reduction (1-2mm)(5)
	Adequate occlusal bevel on buccal and lingual cusps (5)
	No reduction on the buccal surface below the height of the contour. No reduction to mesio-buccal bulge (5)
	Minimal reduction on the lingual surface below the height of contour (5)
	Adequate interproximal clearance (contact open, no gingival ledges, walls converge lingually when viewed from the occlusal)(5)
B isolation	All line angles rounded (5)
	Appropriate size of rubber dam clamp (1)
	Appropriate rubber dam isolation (2)
	No damage to adjacent teeth (2)

Critical errors on the preparation that require repetition of the prep

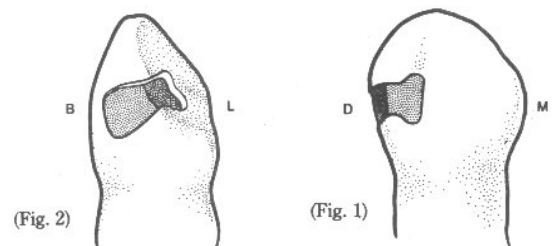
- Over reduction on any surface
- Lack of mechanical retention of the crown due to over reduction
- Damage to the adjacent tooth
- Open margins (due to too much occlusal reduction)

Errors that can be fixed

- Crown is a bit loose, crimping can increase retention
- Interproximal contact not completely broken
- Slight gingival ledge


C restoration	Correct crown position, not tilted or rotated. Not too far subgingival (5)
	Tight adaptation of crown, difficult to remove (5)
	Restore contact if it was there to start with (5)
	Excess cement removed (5)
Marks total/grade	60

- Canine class 3 restoration
 - Parallel incisive and gingival walls- to each other and to the occlusal plane
 - Extend the walls incisal and gingival to the contact point
 - Axial depth is 1~1.5 mm and labial/lingual floors are 1.5mm deep
 - The dovetail adds extra retention for amalgam but not essential for composite
 - The filling may be composite or amalgam if aesthetics are not an issue
 - Can use a metal matrix band and wedge for composite. Remember to do a second cure after removing the matrix band
 - If amalgam then fill as class II

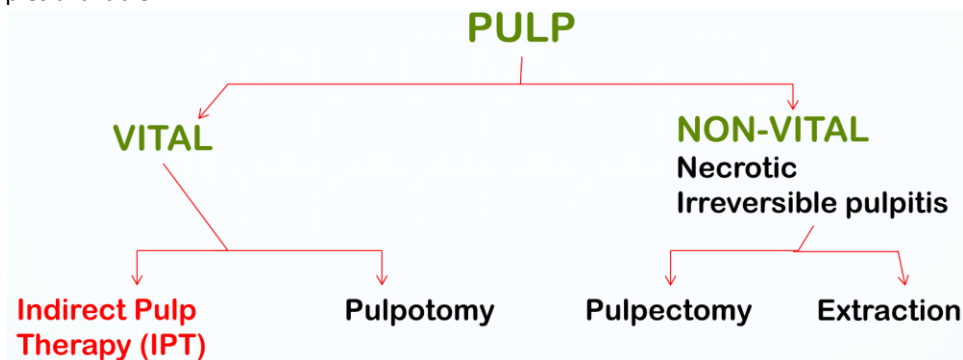


Pulp therapy

- Assessing vitality of the pulp

	If tooth is vital	If tooth is non vital
Patient/parent reporting signs of symptoms	-Intermittent pain -Solicited pain (there is a trigger)	-Spontaneous, prolonged, nocturnal pain -Or could be no pain -Other sx: fever, malaise, poor appetite
Clinical signs (cavity, large abscess, mobility, extrusion)	-Cavity, food getting stuck -Cavity may be arrested (dark and shiny) -Normal mobility -No sinus tract or soft tissue changes	-Cavity, food getting stuck -Swelling (inside mouth → gum boil, outside mouth → cellulitis) -Possibly a sinus tract -"Pulp polyp" 
Diagnostic tests	-Radiograph shows caries into dentin, large restorations, intact PDL, and normal bone	-Radiograph shows caries into dentin and/or pulp, large restorations, widened PDL, furcation, periapical radiolucency, and external/internal root resorption
	-Electronic: useless because of variability in primary teeth and kids' interpretations -Thermal testing: better, but still has limitations due to kids' interpretations -Percussion: is still not that great, but will give the most info	
Operative diagnosis (opening pulp)	-Scarlet/crimson blood or no blood -Intact pulp tissue	-Dark thick blood and profuse bleeding -Frayed and discoloured pulp

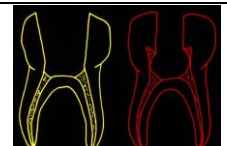
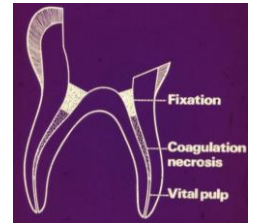
- If patient presents with swelling and fever due to the tooth
 - Key is to extract the tooth. However, profound LA will not be possible in an infected site
 - Give ABX for 3~5 days for infection to settle. Then, you can bring pt back to extract
 - Abscess formation
 - In adults, most likely to be at the apices of teeth
 - In children, most likely to be at the furcation of D's and E's due to wide pulp chambers and thin furcation
- Pulp therapies available




- Note: when you are prepping a tooth, there may be pinpoint exposure (no bleeding) of pulp
 - Normally, you would direct pulp cap it with CaOH/ GIC and then restore the rest of the tooth
 - However, **direct pulp caps in primary teeth usually lead to internal resorption. Therefore, it is not recommended**
 - This is why direct pulp cap is not listed as a treatment option on the chart. Instead, go straight to pulpectomy
- Indirect pulp therapy
 - Remove caries, but leave a thin layer of stained dentin at deepest sites
 - Place a GI liner and place a stainless steel crown on tooth
 - Indications: no irreversible pulp pathology
 - Careful case selection
 - 96% success rate in 3 years

- Pulpotomy

Indications	-Caries/iatrogenic pulp exposure -Coronal pulp affected/infected -Vital radicular pulp tissue		
Objectives	-Put tooth in asymptomatic state -Maintain healthy periodontium		
Ideal pulpotomy material traits	-Promotes healing of radicular pulp -Harmless to periodontium -No interference with root resorption -Non toxic to patient/operator	-No post op sensitivity -Promotes healing of radicular pulp -Completed in 1 visit -Odorless	-Bactericidal -Inexpensive -Stable
Pulpotomy materials	<p>-No clear evidence that one material is superior to another, but the 2 most favourable are MTA and ferric sulfate</p> <p>Formocresol</p> <p>-Invented in 1904 by Dr Buckley</p> <p>-Formaldehyde 19mL, tricresol 35mL, glycerol 15mL, topped with H₂O to 100mL</p> <p>-“Fixes” pulp tissue → Half dead/half alive and chronically inflamed pulp</p> <p>-Due to chronic inflammation, may get some internal resorption</p> <p>-No longer used in Europe due to possible carcinogenicity</p> <p>-“Formocresol, when used judiciously, is unlikely to be genotoxic, immunotoxic, or carcinogenic in children when used in pulpotomy procedures” – 2008 Pediatr Dent</p> <p>Ferric sulfate</p> <p>-Forms a ferric-ion protein complex when it contacts blood → hemostasis</p> <p>-Similar success rate as formocresol</p> <p>-However, the hemostatic action may disguise inflammation</p> <p>Mineral trioxide aggregate (hand mixed powder + gel)</p> <p>-Portland cement (calcium compounds) 75%, bismuth oxide 20%, gypsum 5%, SiO₂, CaO, MgO, K₂SO₄</p> <p>-Stimulates cytokine release from bone cells → induces hard tissue formation like dentin from pulp</p> <p>-Antimicrobial due to high pH</p> <p>-Superior sealing ability as it sets rock hard</p> <p>-Expensive, but not as expensive as biodentine</p> <p>Biodentine</p> <p>-Tricalcium silicate powder, aqueous calcium chloride solution, excipients</p> <p>-Capsules that are mixed using the amalgamator</p> <p>-Similar success rate to MTA (90~95%) and may even stimulate dentin formation better than MTA</p> <p>Others: sodium hypochloride and laser therapy</p>		
Technique	<p>-Clear all caries and open the roof of the pulp chamber</p> <p>-Use radiographs to guide access</p> <p>-Pulp access should leave no ledges (left) → any remaining pulp tissue (right) can cause pain afterwards</p> <p>-Remove coronal pulp with a spoon excavator and a low speed round bur</p> <p>-Once the pulp stumps have been removed, there should be hemostasis</p> <p>-If bleeding persists, it could be due to:</p> <ul style="list-style-type: none"> -Inadequate access or pulp removal -Insufficient pressure -Entire pulp involvement → move on to pulpectomy or extraction -Perforation <p>-If bleeding stops, proceed to fixation:</p> <ul style="list-style-type: none"> -Moisten a cotton pellet with formocresol -Place it in stump and wait 5 minutes <p>-Finish restoration: place base (IRM) material and SSC it</p>		
Treatment failure	<p>-Overall clinical success is 70~90%, but 63~65% over 3 years</p> <p>-Patient report: pain and swelling</p> <p>-Clinical exam: mobility, sinus tract, or early exfoliation</p> <p>-Radiographic exam: furcation or periapical radiolucency, internal/external root resorption</p> <p>-If resorption of tooth roots are seen, teeth should still be kept in as long as there is no pus</p> <p>-Maintaining the space for permanent teeth is more important, so try to keep teeth in</p>		
Contra-indications	-Cardiac conditions requiring SBE prophylaxis -Immunosuppressed		



- Pulpectomy

Indications	<ul style="list-style-type: none"> -Whole pulp is involved and irreversibly inflamed -Most common on E, A, and B's -Not common on D's and C's because the success rate is poor -Greatest challenge is taking out the pulp tissue as roots of primary teeth are hard to navigate -If the D is involved, more common to do an extraction with a space maintainer -Common on E's because before the 6 comes in, it is the most distal tooth. Missing the most distal tooth makes it difficult for space maintaining (but possible with a "distal shoe") so you want to keep it in as long as you can
Pulpectomy fillers	<p>Zinc oxide eugenol</p> <ul style="list-style-type: none"> -Resistant to foreign body giant cells → not resorbed → sometimes maintained post-extraction -Not antibacterial <p>Alternatives: iodoform (Kri) paste, iodoform + CaOH (Vitapex) paste, and Endoflas</p>
Contra-indications	<ul style="list-style-type: none"> -Non restorable tooth -Perforation of pulp chamber -Pathologic root resorption involving >1/3 of root -Internal root resorption present
Complications	<ul style="list-style-type: none"> -Too much pressure resulting in ZOE leakage out of apex -May disrupt permanent tooth follicle -Could cause a chronic infection after exfoliation of primary tooth -If the primary tooth is extracted, ZOE remnants may be seen → needs to be scooped out 
Prognosis	<ul style="list-style-type: none"> -Overall success rate is 78% -On teeth that have a pulpectomy, their succeeding permanent teeth had: <ul style="list-style-type: none"> -Enamel hypoplasia (18.8%) – related to pre-existing infection -Palatal eruption of incisors (20%) -Ectopic eruption of premolars (22%) -In 36% of cases, all teeth needed extractions
Pulpectomy of anterior teeth	<ul style="list-style-type: none"> -Done under GA or good sedation -After pulpectomy, crowned with clear shells that are loaded with composite and cured on to tooth

- Extraction and space management

- When internal resorption is seen
- Space management will be discussed below

Space management




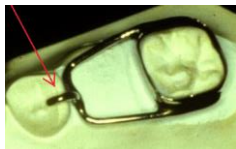
- Healthy teeth are the best space maintainers
 - Makes room for adult teeth to come in
 - Properly restored teeth are the next best space maintainers
- Causes of space loss
 - Dental caries
 - Poorly contoured or inadequate restorations
 - Premature loss of primary teeth
 - Severe ankylosis (tooth fused to bone, so adjacent teeth erupt and tip into the space above ankylosed tooth)
- Effects of space loss
 - Loss of "E space" – ↓ arch length and arch circumference
 - E space is 0.5~1mm on each side of the molar which gives space for the permanent premolars to erupt into
 - Poor esthetics due to ectopic eruptions and buccal/lingual erupted adult teeth
 - Altered eruption times
 - Possible detriments to speech and chewing
- What to consider before placing a space maintainer



Carries risk and home care	-Judge if the tooth is restorable -If the tooth was restored and space maintainer placed, is the child likely to maintain hygiene to keep the spacer clean? -If caries risk is high and many caries already exist, what is the likely success of the space maintainer?
Time elapsed since tooth loss	-Should be placed within 3 months of extraction
Available space	
Orthodontic work	-If the crowding is too severe, may just need to go to ortho and not maintain space
Dental age and bony covering	-1mm of bone remaining = 6~9 months left to eruption ->2/3 of root formed = ~6 months left to eruption -<2/3 of root formed = 9+ months left to eruption -Use radiographs to see about how long it will take for eruption. If it's estimated to be about 9 months, then a space maintainer is totally worth it to prevent tipping of adjacent teeth -If the adjacent tooth is a 6 that's locked in with good occlusion, then a space maintainer may not be necessary as it is unlikely to tip
Patient compliance	-Cleaning space maintainer
Stage of development	-Space maintainer should not interfere with eruption of permanent teeth -Pay close attention to the 6's -All abutments of the space maintainer must be stable until permanent teeth come into contact with proximal teeth
Number of teeth lost	-Single or multiple teeth loss → will determine type of maintainer used
Position of teeth	-Posterior teeth at great risk of movement -Anterior teeth rarely move
Unilateral or bilateral tooth loss	


- Treatment sequence of space maintainers
 - Restore abutments where the "band" part of the space maintainer will be applied (see next page)
 - Fit band → if one size fits good, then try one size smaller as well
 - Take impression with band in place
 - Send to lab with lab prescription (see next page)
 - Extract tooth/teeth
 - Cement appliance

- Types of space maintainers

	Band and loop SM	Distal shoe SM	Bilateral fixed SM
UBC code	15101	15102	15103
Indications and contra indications	<p>-If D is missing, the E will tip forward when the 6's come in, so space maintainer is needed</p> <p>-C's could also drift distally, closing the D space</p> <p>In a primary dentition</p> <p>-Unilateral or bilateral loss of D's</p> <p>-Can use two of these appliances if missing molars on both sides</p> <p>In a mixed dentition</p> <p>-Unilateral loss of D or E as long as abutments are stable</p>	<p>-E is missing and 6 has not erupted yet → means D is the most distal tooth</p> <p>-Band is placed on D so that it can guide the 6 into proper eruption</p> <p>Problems</p> <p>-Maintenance</p> <p>-Position</p> <p>-Don't use in children at risk to infective endocarditis or immunocompromised</p>	<p>-Must have 6's erupted and <u>perm anteriors erupted</u> (unless you can monitor the patient closely)</p> <p>-Image shows holding arch applied before all perm anteriors erupted</p> <p>Maxillary arch (Nance or trans palatal arch appliance)</p> <p>-Bilateral loss of D's</p> <p>-Unilateral loss of 1+ primary molar</p> <p>-Unilateral loss of E</p> <p>Mandibular arch (Lingual holding arch)</p> <p>-Start with band + loop until age 7/8 when 6's and anteriors come in → remove band + loop and replace with holding arch until 13/14 when premolars erupt</p>
Appearance	 <p>-Can be pre-fabricated or made at chairside</p> <p>-“Loop” should be 1mm above gingiva</p>	 <p>-Distal tip of space maintainer has to be on the mesial cusp of 6</p>	
Lab prescription	<p>-Please fabricate band and loop space maintainer from tooth 75 to 73 using 0.036" wire, as drawn on model (enclosed). Cut tooth 7.4 (to be extracted) off model. Band size #33</p>		<p>-Please fabricate LHA from 36 to 46 with teeth #, #, # to be extracted. Use 0.036" wire</p> <p>-Wire to contact cingula of teeth 31, 41, 42, as drawn on model</p> <p>-Band sizes #35 for 36, and #34 for 46</p>
Other information	<p>-If the banded tooth has a SSC on it, simply put a band and loop on the SSC</p> <p>-Don't make a crown with a loop soldered on</p> <p>-If space maintenance is on the E (abutments on D and 6), add an occlusal rest to D as it could tip otherwise</p> 		<p>-Must maintain hygiene to prevent decay under bands</p>

Traumatic injury to primary teeth

- Taking a history
 - Medical and dental history
 - Describe how the trauma was obtained – when, where, and how
 - Did the patient become unconscious? → if yes, refer to emergency for possible head injury
 - Is there a disturbance in bite?
- Initial patient exam
 - **TMJ exam:** check for bite, disk movement, fractures
 - **Soft tissue:** check for lacerations (gingiva, tongue, lip) or open wounds (which could indicate abscess, granuloma, or infection)
 - **Mandibular fracture:** may feel a “step” in mandible, bruising of skin, poor occlusion
 - **Check teeth last:** radiographs, pulp tests, percussion, and photographic recordings
- Treatment planning
 - **Immediate treatment:** head injuries, lacerations, avulsion, alveolar fractures, extrusive/lateral luxation
 - **Within several hours:** concussion, intrusion, subluxation, root fracture, crown fracture w. pulp exposure
 - **Within a few days:** crown fracture without pulp exposure

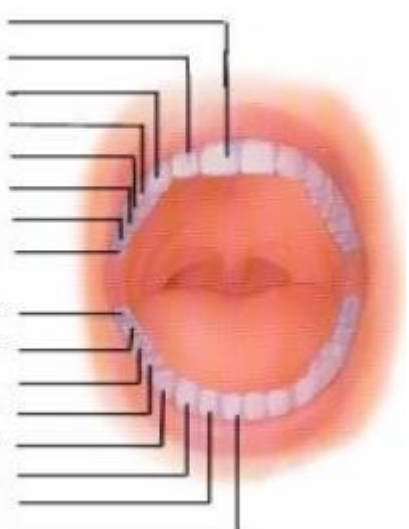
Injury	Treatment in primary teeth		Treatment in perm teeth				
Concussion -Injury to tooth supporting structures without increased mobility -No gingival bleeding -Tooth may be sensitive -Inform pt: tooth may change colour, form an abscess, or react in future	-Take a radiograph as a baseline and check for hairline fractures -Tooth will heal on its own		-Monitor at 4w, 8w, 6m, 1y -Pain relief -Soft diet and good OH -Monitor condition of pulp -Tooth will heal on its own				
Subluxation -Injury to tooth supporting structures with some mobility -PDL could be ripped →bleeding sulcus -No tooth displacement	-Monitor at 3m -Take radiographs -Recommend soft diet, pain relief, good cleaning -Pulp could obliterate, necrose, or be fine		-Monitor at 2w, 4w, 3m, 6m, 1y -Physiologic splint for 2w if very mobile -Soft diet and good OH				
Lateral luxation -Displacement of tooth not along its axis  -Could be accompanied by communion or bone fracture (especially when 2~3 teeth affected) -Can damage underlying developing tooth germ	-No occlusal interference + 1 tooth → no treatment -Interfering with occlusion → remove tooth -Associated fracture: reposition and suture, or let it be if it's stable -Soft diet, good OH -Reassess in 1 week to check for tooth necrosis -If in any doubt, take it out (because any manipulation may damage adult follicle) -Usually, crowns luxate posteriorly → roots tip anteriorly → adult follicle (on lingual side) is safe -Take an X ray: <table><tr><td>Luxated tooth looks shorter</td><td>Tooth root displaced away from follicle (good)</td></tr><tr><td>Luxated tooth looks longer</td><td>Tooth root displaced towards follicle (bad)</td></tr></table>		Luxated tooth looks shorter	Tooth root displaced away from follicle (good)	Luxated tooth looks longer	Tooth root displaced towards follicle (bad)	-Monitor at 2w, 4w, 6~8w, 6m, 1y, and yearly for 5 years -Reposition tooth with fingers or forceps to disengage it from bony lock -Physiological splint for 4 weeks -Monitor pulpal condition -RCT if pulp becomes necrotic (to prevent root resorption)
Luxated tooth looks shorter	Tooth root displaced away from follicle (good)						
Luxated tooth looks longer	Tooth root displaced towards follicle (bad)						
Extrusion -Partial displacement of tooth from socket -PDL is partially or totally disrupted -Alveolar socket is intact -May be protrusive/retrusive	-≤3mm → leave it ->3mm → extract		-Monitor at 2w, 4w, 6~8w, 6m, 1y, and yearly for 5 years -Push it back in with finger -Physiologic splint for 2 weeks -If a mature/immature tooth is anticipated to have pulp necrosis, then RCT it				

Injury	Treatment in primary teeth	Treatment in perm teeth									
Intrusion -Displacement of the tooth into the socket -Involves fracture of the socket -Damage to underlying tooth bud could happen	-<3mm will re-erupt -Take pictures and measure -First recall in 3 weeks -Make sure tooth isn't ankylosing -<3 yo → leave it ->3 yo → extract	-Monitor 2w, 4w, 6~8w, 6m, 1y, and yearly for 5 years Open apex (tooth root still forming) -<7mm → spontaneous repositioning ->7mm → ortho/surgical repositioning Closed apex (tooth completely formed) -<3mm → spontaneous repositioning -3~7mm → ortho/surgical repositioning ->7mm → surgical repositioning and endo within 2w -After repositioning, physiologic splint for 4w									
Avulsion -Tooth is completely displaced out of the socket	-Don't put it back in -Frequent recalls to check for cystic formation in socket -Monitor until permanent teeth erupt -Take regular X rays	-If tooth avulses, rinse it and replant ASAP -If not, preserve in cold milk or Hank's balanced salt solution and bring to dentist -PDL dies in 3~5 mins EO without preservative <table border="1"> <tr> <td></td><td><60 min EO time</td><td>>60 min EO time</td></tr> <tr> <td>Open apex</td><td> -Replant ASAP -Flexible splint 2w -Monitor for inflam, resorption, ankylosis -Remove nerve and apply CaOH if no revascularization -Regen-endo then RCT </td><td> -Remove PDL and nerve -Place NaOH or RCT -Replant tooth -Rigid splint 4w -Will ankylose </td></tr> <tr> <td>Closed apex</td><td> -Poor prognosis -Clean, soak in 2% NaF, and replant -Flexible splint 2w -RCT in 7~10d -Ankylosis likely </td><td> -Poor prognosis -Remove PDL and nerve -Place NAF -Rigid splint 4w -Ankylosis likely </td></tr> </table> -Ankylosis is better than losing tooth and hence bone -Try to replant tooth and later in life when tooth is ankylosed, you can take it out and put an implant in		<60 min EO time	>60 min EO time	Open apex	-Replant ASAP -Flexible splint 2w -Monitor for inflam, resorption, ankylosis -Remove nerve and apply CaOH if no revascularization -Regen-endo then RCT	-Remove PDL and nerve -Place NaOH or RCT -Replant tooth -Rigid splint 4w -Will ankylose	Closed apex	-Poor prognosis -Clean, soak in 2% NaF, and replant -Flexible splint 2w -RCT in 7~10d -Ankylosis likely	-Poor prognosis -Remove PDL and nerve -Place NAF -Rigid splint 4w -Ankylosis likely
	<60 min EO time	>60 min EO time									
Open apex	-Replant ASAP -Flexible splint 2w -Monitor for inflam, resorption, ankylosis -Remove nerve and apply CaOH if no revascularization -Regen-endo then RCT	-Remove PDL and nerve -Place NaOH or RCT -Replant tooth -Rigid splint 4w -Will ankylose									
Closed apex	-Poor prognosis -Clean, soak in 2% NaF, and replant -Flexible splint 2w -RCT in 7~10d -Ankylosis likely	-Poor prognosis -Remove PDL and nerve -Place NAF -Rigid splint 4w -Ankylosis likely									
Uncomplicated enamel fracture -Incomplete fracture of enamel -No loss of tooth structure -May be seen better on transillumination		For "craze lines": -If very big and obvious, etch and seal with resin to prevent discoloration -Otherwise, no treatment necessary -Notify patient that tooth may fracture in future For fractured fragments: -Bond fragment back on, or restore with composite resin -Follow up at 6~8 weeks and 1 year									
Uncomplicated enamel dentin fracture -Loss of tooth structure involving enamel and dentin -Not involving pulp	-Leave it -Smooth if sharp	-Monitor 2w, 3m, 6m, 1y with X rays -Give LA to relieve pain, smooth edges of fracture <u>Temporary</u> : GI to block dentin tubules <u>Permanent</u> : composite buildup -CaOH + GI if fracture is <0.5mm of pulp -If fragment is found, try to bond it back -Pain relief, good OH, soft diet									
Complicated enamel dentin fracture (pulp exposure) -Loss of tooth structure involving enamel, dentin, and pulp	-Pulpectomy -Extraction may be preferred	-Monitor 6~8w, 1y with X rays -Closed apex → RCT -Open apex → pulp capping or MTA pulpotomy (Cvek pulpotomy) -If fragment is found, try to bond it back									
Crown root fracture +/- pulp -Loss of tooth structure involving crown and root -Can sometimes expose pulp -Often can affect posterior teeth too (don't just check anteriors)		-Monitor 2w (if splinted), 6~8w, 6m, 1y with regular X rays -GI for any exposed dentin -Splint loose fragments until later -No pulp exposure → crown -Pulp exposure → RCT then crown -Might have to do extrusion, gingivectomy, or decoronation to get more tooth structure to work with -If severe, then extract									

Injury	Treatment in primary teeth	Treatment in perm teeth
Root fracture -Fracture of tooth, cementum, dentin, and pulp -Confined to root -Coronal fragment could luxate -Bleeding on sulcus	-Fracture in apical 1/3 → wobbly tooth → extract	-Monitor 4w, 6~8w, 4m, 6m, 1y, 5y -Apical 1/3 → leave it (stable enough for hard tissue healing) -Middle 1/3 → leave it (stable enough too) -Coronal 1/3 → extract or RCT + splint to encourage hard tissue formation around fracture
Alveolar fracture -Mobility of several teeth -Occlusal interferences often present		-Monitor 4w, 6~8w, 4m, 6m, 1y, 5y -Reposition any displaced segment and then splint -Suture gingival laceration if present -Stabilize the segment for 4 weeks

- Complications
 - Pulp canal obliteration
 - Trauma triggers pulp to over-produce dentin → canal becomes constricted and pulp shrinks
 - Tooth turns gray → turns yellow (sign of healing or obliteration) → turns yellow-brown (stable)
 - Pulpal necrosis
 - Trauma or infection increases blood flow to the pulp
 - Pulp tissue gets strangled by hyperemia and dies
 - However, pulp is dead in a sterile environment so there is no pain
 - Can leave it in place with no treatment, unless it becomes infected
 - Infections in primary teeth should be dealt with quickly. Pus accumulating can affect permanent teeth's ameloblasts → adult tooth erupts with enamel hypoplasia (Turner tooth)
 - Ankylosis
 - "Splinting" is done by a metal wire anchored to teeth with some composite
 - If splinting is rigid, then the tooth could fuse with bone when re-positioned
- Trauma prevention
 - Anticipatory guidance
 - Electrical cord awareness – tell children not to bite on electrical cords
 - Sports safety (like a sports guard)
 - Increased risk if excessive overjet
- Eruption speed when primary teeth are extracted
 - If >1/3 of adult tooth is formed → eruption will be accelerated
 - If <1/3 of adult tooth is formed → eruption will be delayed

	Primary Erupt	Permanent Erupt	
Upper Teeth			
Central Incisor	8-12 mos.	7-8 yrs.	
Lateral Incisor	9-13 mos.	8-9 yrs.	
Canine (cuspid)	16-22 mos.	11-12 yrs.	
First Premolar		10-11 yrs.	
Second Premolar		10-12 yrs.	
First Molar	13-19 mos.	6-7 yrs.	
Second Molar	25-33 mos.	12-13 yrs.	
Third Molar		17-21 yrs.	
Lower Teeth			
Third Molar		17-21 yrs.	
Second Molar	23-31 mos.	11-13 yrs.	
First Molar	14-18 mos.	6-7 yrs.	
Second Premolar		11-12 yrs.	
First Premolar		10-12 yrs.	
Canine (cuspid)	17-23 mos.	9-10 yrs.	
Lateral Incisor	10-16 mos.	7-8 yrs.	
Central Incisor	6-10 mos.	6-7 yrs.	



Jessica DALE

- What is the most common pathway for a sinus tract to form in primary dentitions?
 - Attached gingiva next to the buccal furcation on primary molars
 - Floor of pulp chamber is very thin → infection in pulp can easily travel into furcation
 - Root canals of D's and E's are thin and tortuous → unlikely to see a periapical lesion
- Diagnostic tests for pulp status
 - Radiographs are the best
 - Interradicular radiolucencies or caries leading to pulp
 - Widened PDL or discontinuous PDL
 - Look for root resorption
 - Internal RR: likely due to inflammation and tooth will become non vital
 - External RR: likely due to trauma → causing leakage of bacteria to PDL → tooth still vital
 - Calcified masses (pulp stones) in the pulp means pulp is vital and reacting
 - Which radiographs are the best?
 - Bitewings
 - Best beam angulation to view straight through furcation and PDL
 - PA may be necessary to see status of adult tooth underneath
 - Pulp testing
 - Mostly useless due to false positives, false negatives when asking children
 - EPT is the worst out of all pulp test methods due to different pulp structure in primary teeth
- Space maintainers
 - Contraindicated with poor oral hygiene
 - If there's a 6 with no E, the 6 will drift but most movement will be tipping
 - First recall in 6~8 weeks and every 6 months thereafter
- Families receiving MSP premium assistance (don't make enough to pay for MSP) are automatically signed up for BC healthy kids program
 - Dependents <19yo are eligible for \$2000 basic dental services over 2 yr period
 - Refreshed on the odd year
 - IF \$2000 is not used it is not added onto the next \$2000 (\$2000 is just refreshed)
 - Emergency services are covered if you use up \$2000
 - Balance bill—get a certain amount of money > than fee guide
 - 2x/year you can charge for cleaning
 - Receptionist needs to see BC Care Card and confirm coverage immediately before service begins b/c BCHKP is a month to month program
 - Child could be removed from month to month program if parents' income goes up

Jack DALE

- Jack
 - 10 year old boy fell off his scooter
 - Tooth 31 is avulsed, but replanted immediately. Tooth 31 has an closed apex
 - Teeth 12 and 21 have fractured crowns (no pulp = uncomplicated). These teeth have an open apex
 - Tooth 11 has a fractured crown (with pulp = complicated). These teeth have an open apex
- What to treat first?
 - 31 was avulsed, but immediately replanted – it is stable so it can wait
 - Priority is to deal with the pulp exposures
 - Tooth 11: 3mm huge pulp exposure
 - Direct pulp cap would be difficult for this case
 - Cvek/partial pulpotomy with CaOH is a better choice
 - Bond and seal the tooth with a composite restoration
 - This is to allow the tooth to mature and develop its full roots
 - Next, deal with less urgent teeth
 - Tooth 12: minor chip – just recontour sharp edges
 - Tooth 21: direct composite
 - Finally, deal with the avulsed tooth
 - Place splint on lower incisors to stabilize tooth 31
- Take home instructions
 - Prescribe analgesics, mouth rinse, and possibly antibiotics
 - Rebook in 10~14 days to remove pulp on 31 (closed apex = minimal chance of revascularization) and fill with CaOH
 - Rebook in 6~12 months to do full RCT on 31
- Prevalence of traumatic injuries
 - 15~30%, accounting for all types
 - Peaks where trauma happens: toddler years, childhood (esp boys 8~12)
 - By age 5, 30% of boys and 25% of girls are likely to have a traumatic dental event
 - What factors contribute to injury?
 - Seasonal peaks as children do more outdoor activities
 - Toddlers learning to walk/climb in their home, especially with poor supervision
 - Kids that experience dental injury tend to have high incidence of recurrence (often of same tooth)
- Prevention
 - Better supervision of kids
 - Properly tethered car seats
 - Use of mouth guards (only 5.5% compliance in school sports and 20% in organized sports)
- Classification of injuries to anterior teeth
 - Crown/root injury
 - Crown fractures: enamel only or enamel + dentin
 - Crown root fractures
 - Root fractures
 - Any of these can be or be without pulp involvement
 - PDL/bone injury
 - Concussion
 - Subluxation
 - Lateral/intrusive/extrusive luxation
 - Avulsion/replantation



- General rule for management of primary dentition trauma is **conservative management** of soft tissue injury, **aggressive management** of hard tissue injury
 - If the tooth has a pulp exposure, extract it
 - If the tooth has been luxated more than 3 mm in any direction then extract it
 - DO NOT REPLANT avulsed primary incisors under any circumstances!
 - Usually suturing is not required for degloving type injuries unless bleeding cannot be controlled, and antibiotics are not required unless wound is very dirty
 - Usually the little ones heal very quickly with soft diet and analgesics
- The Key points are:
 - DO NO HARM to the permanent tooth
 - Young children can be difficult to examine and treat
 - Get that radiograph especially if tooth substance not accounted for
 - Splinting rarely needed for primary teeth
 - Pulp tests rarely reliable
 - Extraction is usually the default – 3 mm rule
 - Think of child abuse if things don't add up
 - If the tooth has an open apex, your goal is to keep the pulp vital until tooth forms an apex and matures
- Risk of pulpal necrosis
 - Risk of the tooth undergoing pulpal necrosis is **additive** (if multiple injuries) and greatest in **closed apex** teeth
 - Risk of pulpal necrosis also increases with **time left untreated**
 - Pulpal necrosis risks of some injuries:
 - Uncomplicated crown fracture on an open apex tooth → 3%
 - + concussion → 6%
 - + subluxation → 30%
 - Uncomplicated crown fracture on a closed apex tooth + subluxation → 80%
 - If untreated for >3 days, risk of PN triples
- Splinting
 - Should allow some movement → allows PDL to heal
 - If the intent of splinting is to heal PDL → 2~3 weeks is sufficient
 - If the intent of splinting is to heal root/alveolar fracture or promote ankylosis → longer
 - Steps in splinting
 - Etch/bond 2 teeth mesially and distally of the injured tooth
 - Cut some 014 Ni-Ti or stainless steel wire and adapt it to the arch
 - Secure wire using composite on all abutment teeth first
 - Take X ray to see if injured tooth is correctly positioned before attaching to wire
 - CHX may help minimize gingival inflammation due to plaque accumulation

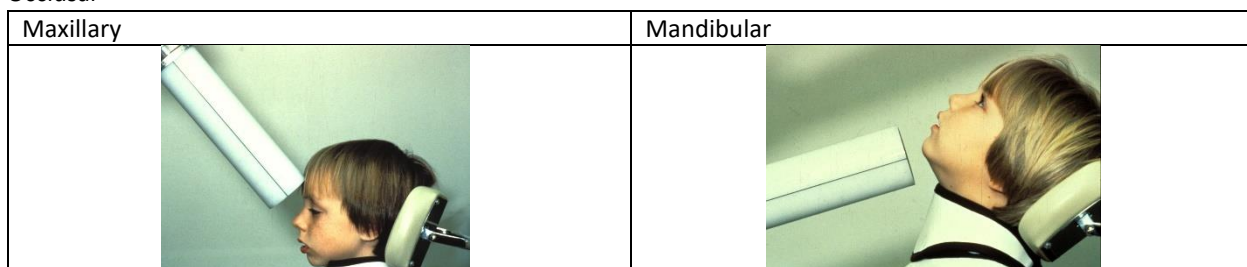
Pediatric radiology

- Deciding to take radiographs
 - There's no "routine" films indicated for a time or age
 - Only the dentist makes the decision for radiographs
 - Use each film to the maximum
- In our Douglas College pediatric program
 - We will be using analog radiographs
 - Ask CDA regarding how to take it and infection control procedures
 - Charting will all be done on paper too (even radiographic interpretation)
- Minimizing radiation exposure
 - Protective shielding, type of cone, equipment standards, film holding devices, using a fast film
 - In office quality assurance
 - History of previous radiographs
 - Practice
- Guidelines for prescribing pediatric radiology

GUIDELINES FOR PRESCRIBING DENTAL RADIOGRAPHS					
	Patient Age and Dental Developmental Stage				
Type of Encounter	Child with Primary Dentition (prior to eruption of first permanent tooth)	Child with Transitional Dentition (after eruption of first permanent tooth)	Adolescent with Permanent Dentition (prior to eruption of third molars)	Adult, Dentate or Partially Edentulous	Adult, Edentulous
New patient* being evaluated for dental diseases and dental development	Individualized radiographic exam consisting of selected periapical/occlusal views and/or posterior bitewings if proximal surfaces cannot be visualized or probed. Patients without evidence of disease and with open proximal contacts may not require a radiographic exam at this time.	Individualized radiographic exam consisting of posterior bitewings with panoramic exam or posterior bitewings and selected periapical images.	Individualized radiographic exam consisting of posterior bitewings with panoramic exam or posterior bitewings and selected periapical images. A full mouth intraoral radiographic exam is preferred when the patient has clinical evidence of generalized dental disease or a history of extensive dental treatment.		Individualized radiographic exam, based on clinical signs and symptoms.
Recall patient* with clinical caries or at increased risk for caries**	Posterior bitewing exam at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe.			Posterior bitewing exam at 6-18 month intervals.	Not applicable
Recall patient* with no clinical caries and not at increased risk for caries**	Posterior bitewing exam at 12-24 month intervals if proximal surfaces cannot be examined visually or with a probe.		Posterior bitewing exam at 18-36 month intervals.	Posterior bitewing exam at 24-36 month intervals.	Not applicable
Recall patient* with periodontal disease	Clinical judgment as to the need for and type of radiographic images for the evaluation of periodontal disease. Imaging may consist of, but is not limited to, selected bitewing and/or periapical images of areas where periodontal disease (other than nonspecific gingivitis) can be identified clinically.				Not applicable
Patient for monitoring of growth and development	Clinical judgment as to need for and type of radiographic images for evaluation and/or monitoring of dentofacial growth and development.		Clinical judgment as to need for and type of radiographic images for evaluation and/or monitoring of dentofacial growth and development. Panoramic or periapical exam to assess developing third molars.	Usually not indicated	
Patient with other circumstances including, but not limited to, proposed or existing implants, pathology, restorative/endodontic needs, treated periodontal disease and caries remineralization	Clinical judgment as to need for and type of radiographic images for evaluation and/or monitoring in these circumstances.				

- Conditions needing radiographs
 - Caries: extensive caries may affected health of the pulp, so radiograph is indicated
 - Large restorations: check health of pulp and radiolucencies (especially in furcation area)
 - Swelling
 - Sinus tract
 - Trauma: take a periapical of injured tooth and another on the opposing tooth
 - Non physiologic mobility
 - Growth and development: eruption issues (missing teeth) or space analysis
 - Unusual tooth colour
 - Missing teeth
 - Developmental anomalies
 - Foreign objects
- Film sizes
 - Size 4 – occlusal 2'' x 3.5'' film for specific uses
 - Size 2 – can be used as an occlusal film in young children
 - Size 0, 1, 2 – bitewings and periapicals
- How to take radiographs on children
 - Tell-show-do with child and the X ray machine
 - Get machine ready: positioned, turned on, exposure time set
 - Use largest film possible and appropriate film holder
 - Easiest first (like occlusal films) so child learns how to be positioned for harder radiographs
 - Tell them you're leaving the room because you want the machine to take pictures of their teeth only, not yours
 - Tell them the X ray head is like an iPhone camera for the teeth
 - Distract child, and don't ask questions which may cause child to nod
 - Praise specific behaviour, be encouraging
- Techniques

- Occlusal



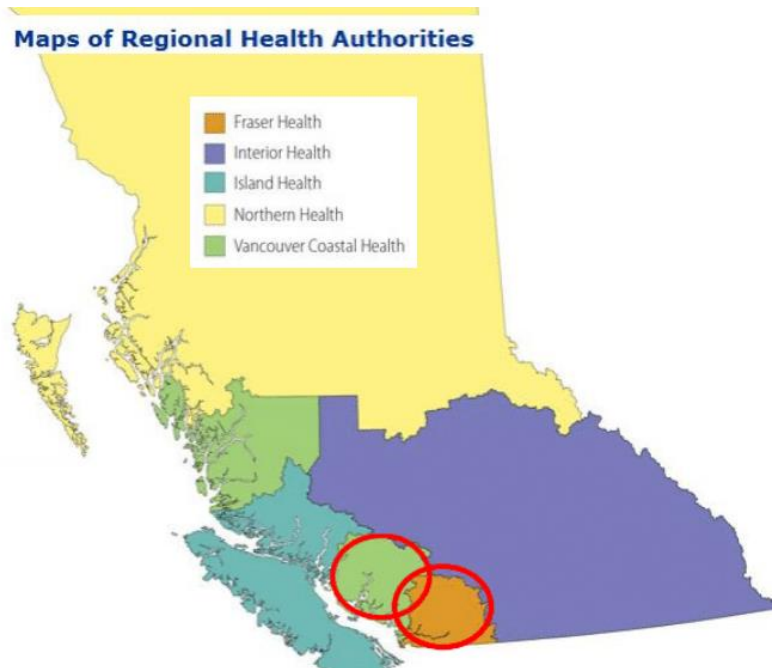
- Bitewings
 - Sticky tabs are attached to PSP's and patient is asked to bite on it
 - Snap-a-ray is also a choice to give child a stable surface to bite on
 - Not as diagnostic, but it is the best method to break the broad contacts seen in pediatric teeth
- Posterior periapicals
 - RINN is used
 - Snap-a-ray can also be used
 - Better to see periapical and furcation areas with

Children's dental program

- Objective: provide care for economically disadvantaged children
- Partnership between UBC and Regional health to form the UBC children's dental program
 - There are 5 regional health authorities (right) and 1 provincial health authority in BC
 - Ministry of health funds these authorities
 - Regional health authorities govern, plan, and deliver health care within their geographic areas
 - UBC does not charge children in this program. UBC absorbs the cost of treatment and cost of transportation for children
- Pediatric dentistry
 - Pediatric dentistry is that branch and specialty of dentistry concerned with providing primary and comprehensive preventive and therapeutic oral health diagnosis, care and consultative expertise for infants and children through adolescence, including those of all ages with special care needs
- Well-child care visits
 - Includes: physical measurements, patient Hx, sensory screenings, behavioural assessments, and planned procedures (immunizations, screenings, other tests)
 - Suggested intervals: 2~5 days, 1m, 2m, 4m, 6m, 9m, 12m, 15m, 18m, 2y, 2.5y, 3y, 4y
 - Focuses on "primary prevention" – looks at the entire picture and all things important to wellbeing of the child
- Dental procedures among children

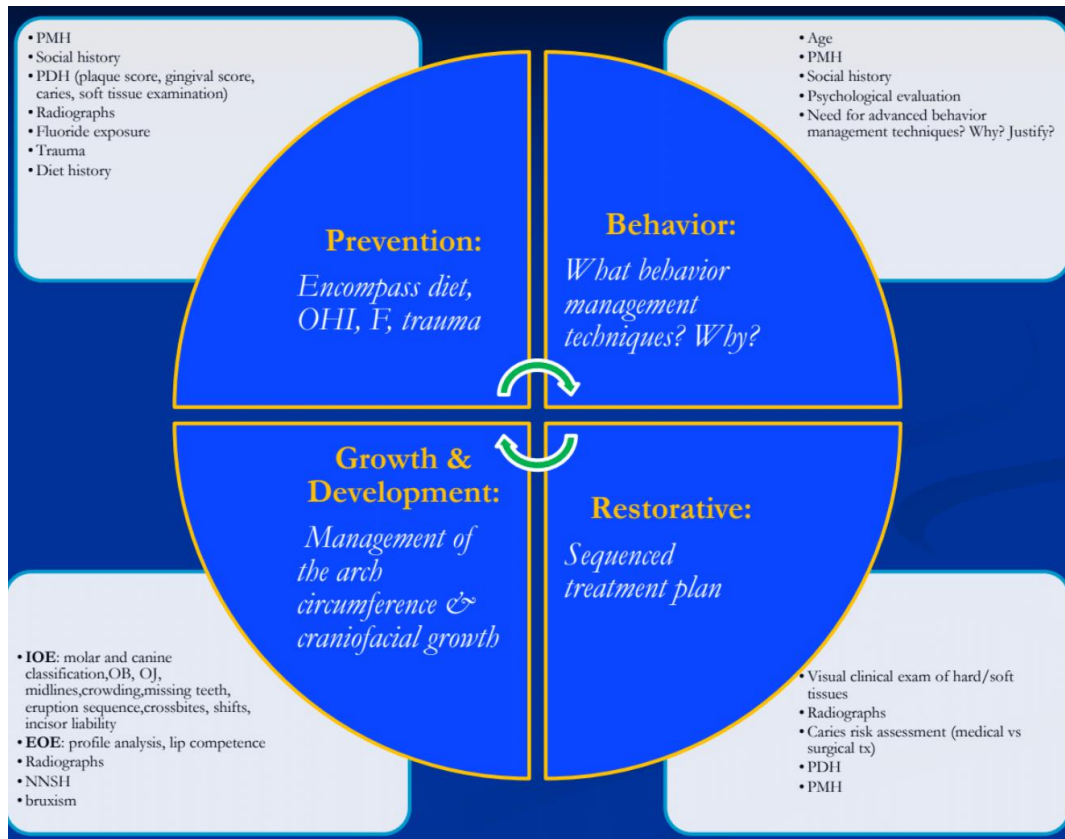
Dental Procedure	*National Data	UBC
Diagnostic	40%	35%
Preventive	34%	26%
Restorative	5%	39%

 - 5% of procedures are restorative
 - 74% of procedures are diagnostic and preventative
 - At UBC, restorative is much higher at 39%
 - Uninsured children are least likely to receive diagnostic and preventative procedures
 - 33% of low income children ages 2~11 have untreated decay
 - Also highest percentage of restorative procedures
- What we will be doing in term 2
 - Introduction to clinical care for children
 - Develop treatment planning, skill, and communicative management skills
 - Application of silver diamine fluoride
 - No nitrous use until October
 - 2 hour appointments – 2pm ~ 4pm. Dismiss by 4:15 as bus leaves at 4:30
 - Recalls will not be done at UBC program – let patient know
- Who do I refer to the graduate pediatric program?
 - Cannot manage child's behaviour
 - Space maintainers
 - Inform parents that grad pediatric clinic is NOT free
- Case presentations
 - Keep some radiographs and photographs for case presentation at the end of the term
 - Review potential cases with instructor



Comprehensive treatment planning

- Steps to make a comprehensive treatment plan
 - Start with a prioritized problem list generated from a comprehensive clinical exam
 - Translate the problem into a systematic, goal oriented plan
 - Address all preventative, behavioural, restorative, and growth and development
 - Treatment plan should be sequenced down to the appointment
 - Prevention → plan for clinic care and home care
 - Behaviour → plan to make the child cooperate in clinic
 - Growth and development → plan for current/future orthodontic needs
 - Restorative → plan for sequenced treatment by quadrant/sextant



- Example of a treatment plan

	Problems	Goals	Planned Therapy
Prevention	<ul style="list-style-type: none"> • 100% plaque score • Unsupervised brushing 	<ul style="list-style-type: none"> • 0% plaque score • healthy gingiva 	<ul style="list-style-type: none"> • Disclose @ subsequent app'ts • OHI for parents/patient
Behavior	<ul style="list-style-type: none"> • anxious behaviour which may result in uncooperative behaviour during dental tx. 	<ul style="list-style-type: none"> • cooperative child who accepts dental care 	<ul style="list-style-type: none"> • verbal and non-verbal communication utilizing TSD, active listening, and "I" statements
Growth & Development	<ul style="list-style-type: none"> • loss of ↓ 2nd primary molar with potential for loss of arch circumference 	<ul style="list-style-type: none"> • maintenance of available arch circumference 	<ul style="list-style-type: none"> • placement of LLHA
Restorative	<ul style="list-style-type: none"> • generalized decay 	<ul style="list-style-type: none"> • eliminate active pain & disease • restore function and esthetics 	<ul style="list-style-type: none"> • sequenced restorative tx plan

- Charting oral hygiene

Plaque score

-Disclose the mouth

-Examine the buccal and lingual surfaces of these teeth:

-Most posterior tooth in each quadrant (4 teeth)

-Maxillary anterior tooth (most to least preferable: 51/11, 61/21, 52/12, 62/22)

-Mandibular anterior (most to least preferable: 71/31, 81/41, 72/31, 82/41)

-In total, you will check 6 teeth → 12 surfaces

-Grading the amount of plaque:

0 = no plaque

3 = plaque 2/3 of tooth

1 = thin line of plaque at gingival margin

4 = plaque >2/3 of tooth

2 = plaque 1/3 of tooth

-Interpreting plaque score

-Add up all the plaque scores for each surface

-Total score is 0~3 (0%~6%) → thoroughly clean mouth

-Total score is 10 (21%) → acceptable plaque score

-Total score is 10+ (22~100%) → oral hygiene needs improvement

Gingival score

-0 = normal gingiva

-1 = mild inflammation (slight change in colour, slight edema, no bleeding on brushing/prophylaxis)

-2 = moderate inflammation (redness, edema, bleeding on brushing/prophylaxis)

-3 = severe inflammation (marked redness, edema, tendency to spontaneous bleeding, ulceration)

- Charting in Romexis

- There are “word document templates” which are filled out, signed by instructor, then copy/pasted into Romexis

- Templates exist for:

- New patient exams

- Periodic recall exams

- Use of nitrous oxide

- Oral sedation

- Restorative procedures

- Other behavioural management techniques (voice control, papoose)

- Example patient

- Examination

Review of patient	Clinical findings	Radiographic findings
Age: 5 yr old Arabic male Date of initial evaluation: 9/29/09 Age at NPX: 3 yr 7mo CC: “just a checkup” PMH: N/A, NKDA PDH: brushes 1x/d under supervision, no habits, fluoride in toothpaste and city water, Hx of consuming candies Social history: shy	EO: WNL IO: mild generalized gingivitis Occlusal: mesial step on R/L molar, midline on MSP, OJ 3mm, OB 50%, spacing in U/L anteriors, no crossbite Height: WNL Weight: WNL Behaviour: shy, Frankl 4	-Caries on ____ teeth

- Treatment plan

	Problems	Goals	Planned therapy
Prevention	-55% plaque score -High sugar -Gingivitis	-0% plaque score -Healthy diet -Healthy gingiva	-Disclose and F application -OHI for patients/parent -Diet counselling
Restorative	-Generalized decay	-Eliminate pain and disease -Restore function	-Appt 1: 64 DO, 84 SSC, 85 SSC -Appt 2: 74 DO, 75 MO -Etc etc
Growth and development	-WNL	-Maintain and monitor arch circumference	-Monitor during recalls
Behaviour	-Shy	-Cooperative child who accepts dental care	-Use N ₂ O -Verbal/non verbal communication (TSD, active listening, I statements)

Silver diamine fluoride

- Preparation is a colourless liquid with the following components:
 - 25% silver as a bactericidal agent and deactivates proteins for a sustained duration
 - 8% ammonia as a solvent
 - 5% fluoride for remineralization, increasing lesion hardness, and prevents demineralization
- What does it do?
 - Arrests dental caries
 - Prevents dental caries directly and indirectly
 - Decreases dentin hypersensitivity by occluding deep into the dentinal tubules
 - Silver accumulates in bacteria → kills bacteria → dead bacteria becomes deadly to surrounding bacteria too
 - SDF accumulates more into demineralized dentin than sound dentin → demin. dentin becomes more resistant to caries than sound dentin
- History
 - Silver nitrate used globally for >1000 years
 - Silver fluoride used in Japan for ~900 years. Known to prevent caries, but blackens teeth
 - In 1960's Japan added ammonia to preparation. This is what we have today
- Evidence for efficacy
 - 9 Randomized control trials on 1493 patients concluded that it is safe
 - 6 RCT's on caries showed that SDF can arrest 90% of caries if applied 2x/yr, 40~80% if applied 1x/yr
 - 6 RCT's on caries prevention showed that it prevents 25~70% of caries (outperforms everything by far), and 70~80% in kids by application only to lesions
- Objective of use
 - Arrest carious lesions in children
 - Delay or decrease the need for general anesthesia for infants/preschoolers
- Caries doesn't always need to be restored
 - Restorations not always indicated: child's age, ability to cooperate, patient/parent preference, size of lesion, reactivation of lesion, time to exfoliation
 - GI and SSC's are good options if you decide to restore
- Which teeth do we select for SDF?
 - 1mm of dentin
 - Reversible pulpitis
 - No signs/symptoms of irreversible pulpitis
- Informed consent
 - Show parents before/after pictures in areas treated with SDF
 - 1/3 of parents are resistant to the idea of SDF
 - But if the alternative Tx is restoration under general anesthesia (due to inability to cooperate), parents are more willing to pick SDF
 - UBC has a SDF consent form
 - Also recommended to take before/after pictures just for chart documentation, but not required
 - children needing general anesthesia for restorations
- Clinic protocol
 - **Dose:** 1 drop for every 10 kg body weight → this dose given every visit, with weekly intervals at most
 - **Apply on:** visible dentin lesion, visible enamel lesion
 - Currently no evidence to support use on indirectly accessible interproximal surfaces
 - **Repeat:** apply again 1~2 weeks later. 6 months later, reapply twice again. Continue for at least 2 years
 - If lesion has grown, then a restoration is indicated (LA + tooth removal)
 - If lesion has arrested, it can be sealed/restored with GIC (no drilling, no LA, just applying GIC)
 - **Steps:**
 - Prepare by coating gingiva with Vaseline, isolate with cotton rolls, and drying lesion
 - Apply SDF using the smallest available micro sponge
 - Wait at least 1 minute (3 minutes recommended)
 - Remove rolls and dismiss patient (rinsing not indicated)



- SDF's effects on dentin bonding
 - When SDF is applied, wait 1 minute then continue with bonding steps (rinse, etch, etc)
 - SDF does not affect dentin bonding
 - However if using resin cements, then SDF stained dentin needs to be excavated
- Indicators of success
 - Lesion has darkened and hardened
 - A break in black colour at 6 months → very likely active caries → restore
- Long term success
 - Assume patient has done the full 2 year biannual rounds of SDF
 - Caries preventative effect lasts 2 years
 - Unknown what will happen if biannual SDF is stopped after 2~3 years
- Adverse effects
 - No long term effects on child's health
 - Metallic or bitter taste
 - Stains skin and gingiva for 2 weeks until epithelium sloughs off
 - Permanently stains instruments and clothing
 - No evidence to show it will cause fluorosis
- Augmentations to SDF therapy
 - Fluoride varnish + SDF
 - No evidence to show benefits of applying fluoride over SDF
 - May be used because the idea is the varnish will prevent SDF from touching soft tissue or be washed away by saliva
 - Potassium iodide + SDF
 - May lessen, but not dramatically effects stain
 - KI reacts with silver ions → produces silver iodide → cream white reaction product
- SDF use on permanent molars?
 - Indicated to manage active enamel lesions in erupting molars
 - Sound enamel is not stained
- SDF use on primary tooth pulp
 - Elicits a favourable response, forms reparative dentin, forms several tiers of odontoblasts
 - Normal coronal pulp, with a miniscule amount of silver found
 - No bacteria in cavity prep
- Indications for use
 - Children without access to recalls or sealants
 - Behaviour management challenges (age related or inability to cooperate)
 - Child with special health care needs (unable to cooperate or medically fragile)
 - Severe early childhood caries
- Contraindications
 - Silver allergy (no true documented allergies though)
 - Intraoral ulcerations (can be managed with protecting soft tissues with Vaseline)