

OMFS 430 STUDY REVIEW

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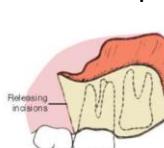
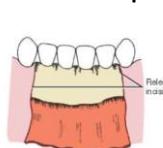
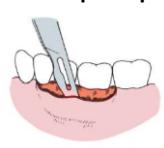
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Principles of Surgery

Swelling at angle of mandible:	
<ul style="list-style-type: none"> - Compensatory Hypertrophy (w/ hypotrophy on contralateral side) - Masseter Muscle myopathy - Masseter muscle neoplasia - Salivary Gland diseases (Sialosis, Parotitis) - Parotid neoplasia (Pleomorphic Adenoma) - Parotid Inflammatory Disease - Odontogenic Problems (Chronic Dental Abscess) - Neoplasia of soft tissues - Vascular Lesion 	

Incisions	
Principle 1 <ul style="list-style-type: none"> - Use a Sharp Blade 	<ul style="list-style-type: none"> - Standard blade = #15 for oral surgery (#11 and #12 are specialized options as well) - Sharp blades allow clean incisions w/o damage from making multiple strokes - The rate a blade dulls depends on resistance of tissues and contact with bone -> Blades need frequent changing
Principle 2 <ul style="list-style-type: none"> - Use Firm continuous strokes 	<ul style="list-style-type: none"> - ↑ tissue damage occurs from repeated tentative strokes. Commit or eat shit! Just use one confident continuous stroke
Principle 3 <ul style="list-style-type: none"> - Avoid Cutting Vital Structures 	<ul style="list-style-type: none"> - Cut deep enough to define the next major layer when making incisions close to vessels, ducts and nerves -> - Don't get lost with how deep you are cutting! - Vessels can be divided, and nerves freed from adjacent tissues away from area to be incised
Principle 4 <ul style="list-style-type: none"> - Make incisions perpendicular to epithelial surface when planning to reapproximate 	<ul style="list-style-type: none"> - A 90° squared edge incision is easier to re-orient properly during suturing and is less susceptible to necrosis from ischemia
Principle 5 <ul style="list-style-type: none"> - Ensure properly placed incisions 	<ul style="list-style-type: none"> - When possible make incisions through ATTACHED gingiva and over healthy bone - Keep a margin of a few mm away from damaged bone -> suture margins should be over healthy bone - Incisions made around teeth to be extracted are done in the sulcus if possible
Flap Design	
<p>Flaps help to ↑ the access to the surgical area</p> <ul style="list-style-type: none"> - Maintaining design principles work to ↓ Necrosis, Dehiscence and tearing 	
Prevent Necrosis	<ul style="list-style-type: none"> - Apex of flap NEVER wider than base <ul style="list-style-type: none"> - Sides should run either parallel or converge to the apex (top) of the flap - Length should be NO MORE than 2x the width of the base. Width should be > length - Axial blood supply should be included in the base - Don't twist, stretch or grab flap w/ anything that could damage the vessels
Prevent Dehiscence	<ul style="list-style-type: none"> - Approximate edges of flap over healthy bone - Handle the edges gently - Don't suture flap under tension <p>*Dehiscence exposes underlying bone = pain, bone loss, ↑ scarring*</p>
Prevent flap tearing	<ul style="list-style-type: none"> - Larger incisions heal just as quickly as short ones -> Go bigger to prevent tearing from imparting too much force on tissue - Add releasing incisions to ↓ the tension placed on the tissues
 2 Sided Flap  3- sided Flap  Envelope Flap	

Hemostasis

Necessary b/c:

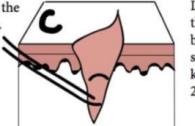
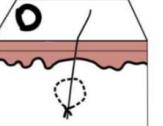
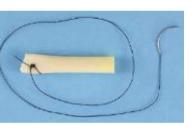
- ↑ visibility during surgery (surgical suction does a better job of keeping the surgical field dry vs restorative suctions)
- ↓ formation of a hematoma which can: ↑ pressure on wound, ↑ tension on wound edges, act as a culture medium to ↑ infections

How to promote Haemostasis	<ul style="list-style-type: none"> - Apply pressure with 2x2 gauze -> 20-30sec (small vessels), 5-10 mins (large vessels) - Place haemostat on a severed vessel - DAB don't wipe the wound -> Wiping ↑ risk to reopen vessels <p>Cautery: Heating to coagulate the ends of a cut vessel and fuse tissues -> can use electricity or heat</p> <ol style="list-style-type: none"> 1. Pt must be grounded to allow current to enter body 2. Cautery tip + metal instrument (haemostat) cannot touch anywhere other than the cautery size (could cause undesirable current path and burn) 3. Remove blood or fluid accumulating around vessel -> Prevents sufficient heat from reaching vessel   <p>Suture Ligation</p> <ul style="list-style-type: none"> - If vessel is large enough, tie it off with a non-resorbable suture (Vicryl) <p>Vasoconstrictive substances -> Epinephrine, or commercial coagulants</p> <ul style="list-style-type: none"> - Place Epi in wound via LA injection or soaking in 2x2 gauze -> Most effective when placed 7-10 minutes before surgery though - Apply coagulant (thrombin, collagen etc) on wound
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Dead Space

= Any area in a wound that remains devoid of tissue after wound closure -> Created by removing deep tissue or not approximating tissues well

- Usually the space will fill with blood -> Haematoma with infection potential

Principles of Dead Space Management	
1. Deep Sutures	<p>Vertical mattress sutures allow for deep tissue suturing, bringing tissue planes together and ↓ the void</p> <p>How do I place deep sutures?</p> <p>A. To start, the needle is inserted at the level of the superficial fascia and exits at the dermal-epidermal junction.</p>  <p>B. The needle is then re-armed with the driver and inserted at the dermal-epidermal junction on the contralateral side and exited at the level of the superficial fascia.</p>   <p>D. Using 3 or 4 throws, the knot is tied and buried at the level of the superficial fascia. The knot is cut leaving only 2mm "trails."</p> 
2. Apply Pressure Dressing	<p>Dressing compresses tissue planes together until they are bound by fibrin or pressed together by surgical edema (or both)</p> <ul style="list-style-type: none"> - Takes about 12-18 hours to happen <p>This is that real kinky shit</p> 
3. Place packing into void until bleeding stops	<p>This is done when tissue cannot be tacked together, to keep the wound edges open, to place pressure dressings</p> <ul style="list-style-type: none"> - Impregnated with antibacterial meds to ↓ infection risk
4. Use drains	<p><u>Suction drains</u> continually remove blood that accumulates in the wound until bleeding stops and tissues bind together -> Eliminates the dead space</p> <ul style="list-style-type: none"> - Allows bleeding to drain to the surface vs creating a hematoma   <p>→ Penrose drain (<u>non-suction</u>)</p>

Wound Decontamination & Debridement

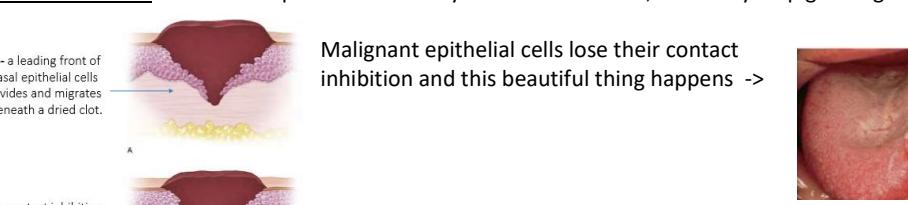
Decontamination	Infection risk ↑ w/ ↑ size of inoculum -> Try to ↓ bacteria count to ↓ risk of infection <ul style="list-style-type: none"> - Irrigate the wound during surgery repeatedly - Irrigation under pressure dislodges bacteria and other foreign materials -> typically w. sterile saline and sterile water
Debridement	= Careful removal of necrotic and ischaemic tissue as well as foreign material that would impede wound healing <ul style="list-style-type: none"> - Only really done from traumatic wounds or severe tissue damage from pathological condition  <p>Like in this dude and his road rash</p>

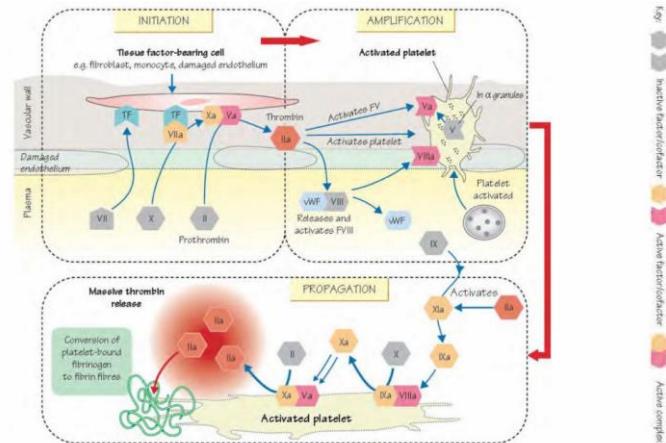
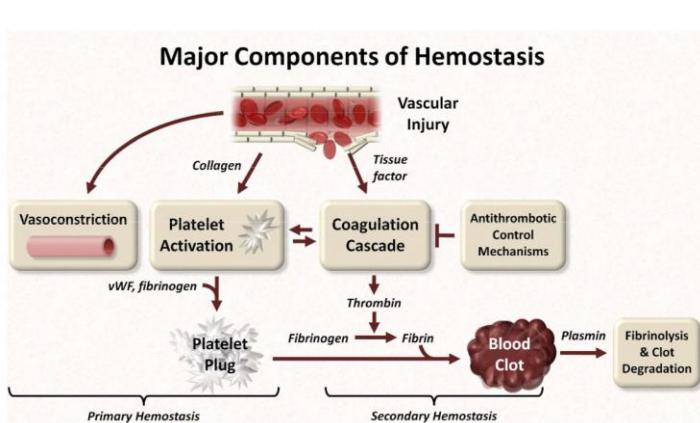
Principles of Wound Repair

Phases of Normal Healing

4 phases to normal healing:

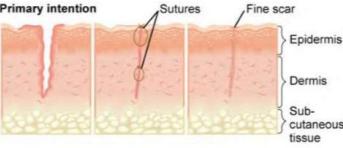
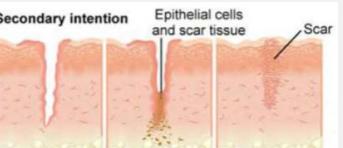
Phase	What goes down						
1. Hemostasis	<ul style="list-style-type: none"> - Vascular constriction - Platelet aggregation, degranulation, fibrin formation (Thrombus) 						
2. Inflammation	<p>Begins the moment tissue injury occurs (lasts typically 3-5 days)</p> <p>2 Phases:</p> <ol style="list-style-type: none"> 1. <u>Vascular</u> <ul style="list-style-type: none"> - Initial vasoconstriction due to Thromboxane and Prostaglandin release -> Slows blood flow to the area to promote clotting - Within minutes: Histamine, PGE1, PGE2 from WBC cause vasodilation and endothelial leakage -> allows leukocytes to migrate to interstitial space - Fibrin from transudate plasma causes lymphatic obstruction -> accumulation of transudate around injury diluting contaminants = Inflammatory Edema - Platelets bind exposed collagen to form platelet plug -> degranulation activates more platelets & ↑ affinity to bind fibrinogen - GPIIb/IIIa (blocked by clopidogrel) is modified. Platelet activating factor (PAF), vWF and Thromboxane A2 stimulate conversion of fibrinogen to fibrin = Propagates formation of thrombus (usually white to begin with) - As red blood cells become trapped thrombus turns red <div style="border: 1px solid black; padding: 5px; background-color: #ffffcc; margin-top: 10px;"> <p style="text-align: center;">Cardinal Signs of Inflammation</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">- Redness</td> <td style="width: 50%;">- Pain</td> </tr> <tr> <td>- Swelling</td> <td>- Loss of Function</td> </tr> <tr> <td>- Warmth</td> <td></td> </tr> </table> </div> 2. <u>Cellular</u> <ul style="list-style-type: none"> - Triggered by activation of serum complement -> C3a and C5a act as chemotactic factors and cause neutrophils to stick to vessel walls (Margination) and migrate through (Diapedesis) - Neutrophils contact bacteria and degranulate -> Proteases released from lysozymes to destroy bacteria - Monocytes/macrophages phagocytize foreign and necrotic materials <p>Infiltration of:</p> <ul style="list-style-type: none"> - Neutrophils - Monocytes -> they differentiate into macrophages as well - Lymphocytes 	- Redness	- Pain	- Swelling	- Loss of Function	- Warmth	
- Redness	- Pain						
- Swelling	- Loss of Function						
- Warmth							

3. Proliferation/Fibroplastic - 2-3 weeks long	<p>Fibrin strands (derived from blood clotting) crosslink wounds and laydown framework which ground substance and tropocollagen is laid \rightarrow ground substance cements collagen together</p> <ul style="list-style-type: none"> - Fibroblasts transform mesenchymal cells to begin tropocollagen production on 3-4th days after injury - Fibroblasts secrete fibronectin to stabilise fibrin, recognise bacteria to be removed by immune system, recruit more fibroblasts, and guide macrophages <p>Migratory subphase</p> <ul style="list-style-type: none"> - Re-epithelialization (Secondary Epithelialisation) - Angiogenesis \rightarrow capillaries bud from existing vessels along fibrin strands that cross the wound - Collagen synthesis \rightarrow Tropocollagen crosslinks to produce collagen <ul style="list-style-type: none"> - Initially laid down haphazardly, \downarrow wound strength, so more collagen is needed initially to strengthen - ECM formation <p>**By end of stage the wound will be: Stiff (\uparrow collagen), erythematous (\uparrow vascularization), Can withstand 70-80% of uninjured tissue tension**</p> <p>Contact inhibition = cells will reproduce until they contact other cells, then they stop growing.</p>  <p>A - a leading front of basal epithelial cells divides and migrates beneath a dried clot.</p> <p>B - contact inhibition and further differentiation and epithelial stratification.</p> <p>Malignant epithelial cells lose their contact inhibition and this beautiful thing happens \rightarrow</p> <p>Squamous Cell Carcinoma</p> <p>Caution: When you open into max. sinus (usually by accident) \rightarrow Epithelium of both the oral mucosa and the sinus wall begin to proliferate. If the sinus wall epithelium first contacts the oral mucosa, Contact inhibition will stop the proliferation creating a nice tasty Oroantral fistula 😞</p> 
4. Remodeling	<ul style="list-style-type: none"> - Collagen remodeling \rightarrow oriented to \uparrow strength (never reached >80-85% max strength though) <ul style="list-style-type: none"> - Less collagen is needed for strength when it is properly oriented = scars soften - Epithelial stratification is restored - Fibroblasts slowly disappear - Vascular maturation and regression \rightarrow \downarrow erythema <p>Wound Contraction</p> <ul style="list-style-type: none"> - Edges migrate towards each other, \downarrow size of wound (when edges are not placed together) - Can cause problems with deep injuries (burns etc) if wounds are not covered with skin grafts <ul style="list-style-type: none"> - Sharply curved lacerations cause mound of tissue on concave side of scar \rightarrow can \downarrow this contraction by placing epithelium between free edges



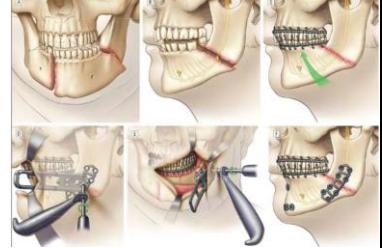
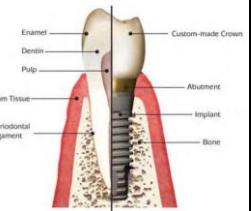
Factors Impairing Healing	
Foreign Material	<p>3 Basic Problems:</p> <ul style="list-style-type: none"> - Bacteria proliferate and cause an infection where bacterial products destroy tissue - Non-bacterial material acts as haven for bacteria, sheltering them from host defense - Chronic inflammatory reaction ↓ fibroplasia
Necrotic Tissue	<p>2 Necrotic issues:</p> <ul style="list-style-type: none"> - Barrier to ingrowth of reparative cells -> Prolongs inflammatory stage while WBC try to remove the tissue - Protected niche for bacteria -> Trapped blood = nutrient source for bacteria
Ischemia	<p>↓ blood is bad:</p> <ul style="list-style-type: none"> - Leads to further necrosis and ↓ delivery of antibodies, WBC, antibiotics - ↓ O₂ and nutrient delivery <p>Causes:</p> <ul style="list-style-type: none"> - Tight or poorly located sutures - Poorly designed flaps - Excessive external pressure - Internal pressure on wound (haematoma) - Systemic hypotension - Peripheral vascular disease - Anaemia
Wound Tension	<p>Anything tending to hold wound edges apart</p> <ul style="list-style-type: none"> - If sutures removed too early wound is under tension, will probably reopen and then heal w/ excessive scar formation and wound contraction - If sutures left in too long, will still tend to spread open during remodeling stage of healing and tract into epithelium through which the sutures ran will epithelialize (permanent disfiguring marks)

Primary, Secondary and Tertiary Intention

Primary Intention	<p>Theoretically ideal but practically impossible clinically -> can get close though</p>  <ul style="list-style-type: none"> - Edges of wound (with no tissue loss) placed and stabilised in the same anatomical position that they were in before injury and allowed to heal - ↓ amount of re-epithelialisation, collagen deposition, contraction and remodeling during healing - Minimal scar tissue, faster healing, ↓ risk of infection <p>Ex: Well-repaired lacerations, well-reduced bone fractures</p>
Secondary Intention	<p>Gap is left btwn edges of incision or btwn bone/nerve ends after repair, OR tissue loss has occurred and prevents approximation of wound edges</p>  <ul style="list-style-type: none"> - ↑ epithelial migration, collagen deposition, contraction and remodeling - Slower healing, ↑ scar tissue vs 1^o intention <p>Ex: Extraction sockets, poorly reduced fractures, deep ulcers,</p>
Tertiary	<p>Healing of wounds via tissue grafts to cover large wounds and bridge the gap between wound edges</p>  <p>-> Skin graft has been "meshed" and spread across wound. = faster healing and smaller graft can spread over larger area</p>

Other Healing mechanisms

Extraction Socket Healing	<p>Empty sockets consist of cortical bone covered by torn periodontal ligament with a rim of epithelium (gingiva) at the coronal portion -> Socket fills with blood (coagulates and seals)</p> <p>Week 1:</p> <ul style="list-style-type: none"> - Inflammatory Stage: WBC enter socket and remove contaminating bacteria + break down debris (bone fragments left there) - Fibroblastic Stage: Ingrowth of fibroblasts and capillaries. Epithelium migrates down socket wall until it reached the epithelium coming down from the other side or a bed of granulation tissue - Osteoclasts accumulate along crestal bone
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	<p>Week 2</p> <ul style="list-style-type: none"> - Most of socket epithelialisation is complete during 2, 3, 4 weeks. Cortical bone continues to be resorbed from crest and walls and new trabecular bone laid down. - As bone fills socket, epithelium moves towards crest and becomes level with adjacent gingiva
	<p>4-6 Months</p> <ul style="list-style-type: none"> - Cortical bone lining the socket is fully resorbed (loss of distinct lamina dura)
	<p>Bone Healing</p>
Bone Healing	<p>Same events as soft tissue healing + Involvement of osteoblasts and osteoclasts to remodel bone</p> <ul style="list-style-type: none"> - Bone formed perpendicular to lines of tension to help withstand forces (Excess forces on fracture healing site produces mobility which compromises vascularity and ↓ healing) -> <i>Functional Matrix Concept</i> <p>Factors required for the best healing:</p> <ul style="list-style-type: none"> - <u>Vascularity</u> -> w/o sufficient blood or O₂ ↑ cartilage is laid down instead of bone, and ↓ ossification - <u>Immobility</u> <p>Osteoblasts are derived from:</p> <ul style="list-style-type: none"> - Periosteum - Endosteum - Circulating pluripotent mesenchymal cells - Lay down osteoid -> Calcifies into bone if immobile during healing <p>Osteoclasts are derived from:</p> <ul style="list-style-type: none"> - Monocyte precursor cells - Resorb necrotic bone and bone to be remodeled
	<p>Secondary Intention Healing</p> <ul style="list-style-type: none"> - *If free ends of bone are >1mm apart -> bone heals via secondary intention (↑ collagen to be laid down to bridge the boy gap, this usually extends past the free ends and forms a callus) - During remodeling, haphazard bone is resorbed by osteoclasts and osteoblasts lay down new bone to resist low-grade tensions
	<p>Primary Intention Healing</p> <ul style="list-style-type: none"> - When bone is not completely fractured (ends are not separated from each other) -> AKA Greenstick fracture OR when surgeon closely reapproximates rigidly stabilises the fractured ends of a bone (<1mm) - Little fibrous tissue is produced = minimal callus formation =  - Best way to achieve this is by applying plates to hold the bone together
Implant Osseointegration	<p>2 Factors:</p> <ol style="list-style-type: none"> 1. Healing of bone to implant 2. Healing of alveolar soft tissue to implant <p>Surface epithelium migration along the implant is stopped by direct bone-implant integration.</p> <ul style="list-style-type: none"> - Can tip the scales and selectively help bone integrate before soft tissue using <i>Guided Tissue Regeneration</i> <ul style="list-style-type: none"> - Woven membranes can be added that have pore size for only O₂ and nutrients to reach bone beneath membrane but prevents fibroblasts from crossing -> This excludes soft tissues - Well adapted abutments (component that extends through the oral mucosa) help as well <ul style="list-style-type: none"> - Epithelium stops migrating when it reaches titanium abutment. Hemidesmosomal basal lamina system forms = ↑ strength of soft tissue attachment to implant abutment <p>Want to ↑ likelihood of bone integrating before the soft tissue around an implant screw, to do this we:</p> <ul style="list-style-type: none"> - Keep short distance between bone and implant (precise implant fit) - Ensure viable bone at or near the surface of the bone along the implant (minimize bone damage) - Have no movement of the implant while bone is attaching - Implant surface reasonably free of contamination by organic or inorganic materials 

	Limit heat production to avoid damaging bone:	Limit forces on implant;
	<ul style="list-style-type: none"> - Use sharp bone cutting instruments - Limit cutting speeds to ↓ friction - Use irrigation to keep bone cool 	<ul style="list-style-type: none"> - Countersinking implant and low profile implants ↓ forces - Cover implant with gingiva during healing (not all the time though, depends)
Implant is covered with a thin layer of <u>titanium oxide</u> -> This layer stabilizes the surface and is the layer that the bone osseointegrates with		
Once initial integration has occurred, limited daily pressure (1mm of strain) on the implant will ↑ cortical bone deposition		

Facial Neuropathy of Traumatic Origin

Occasionally happen w. facial fractures, Tx of impacted teeth, Tx of pathological conditions, or reconstructive surgery

Most commonly injured branches of Trigeminal Nerve are:

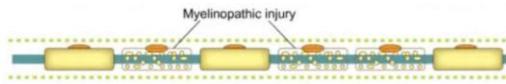
- Inferior Alveolar-Mental nerve
- Lingual Nerve

IAN Damage caused by:

- Mandibular fractures
- Preprosthetic surgical procedure
- Sagittal split osteotomy surgery
- Mandibular resection for oral neoplasms
- Removal of impacted lower wissey's

Neuropaxia	Injury to nerve that causes no loss of continuity of axon <ul style="list-style-type: none"> - Compressed nerves - Brunt trauma - Inflammation around a nerve - Local ischemia Full recovery w/i days to weeks
Axonotmesis	Injury to nerve causing loss of axonal continuity but preserving endoneurium <ul style="list-style-type: none"> - Overly aggressive retraction of mental nerve - Severe blunt trauma - Nerve crushing Possible recovery in 2-6 months
Neurotmesis	Injury to nerve causing loss of continuity to both axonal and endoneurium <ul style="list-style-type: none"> - Cutting IAN during removal of impacted Wisdom Tooth - Badly displaced fractures Poor prognosis for recovery (unless ends are approximated and properly oriented)

Nerve Healing

Nerve Healing	
Phase 1: - Degeneration	<p>Segmental Degeneration</p> <ul style="list-style-type: none"> - Myelin sheath dissolves in isolated segments -> slowing of conduction velocity or fully stop transmission - Axon is spared <p>Symptoms:</p> <ul style="list-style-type: none"> - Paresthesia (Altered sensation, not painful) - Dysaesthesia (Altered sensation, uncomfortable) - Hyperesthesia (↑ sensitivity to stim.) - Hypoesthesia (↓ sensitivity to stim.) <hr/> <p>Wallerian Degeneration</p> <ul style="list-style-type: none"> - Axons AND myelin sheath distal to interruption site undergo full disintegration - Some degen. Proximal to the injury towards the CNS can degenerate (but mostly downstream) 
Phase 2: - Regeneration	<p>Begins almost immediately after injury</p> <ul style="list-style-type: none"> - Proximal nerve stump sends out new fibers that grow down the remnant Schwann cell tube. - Growth at 1-1.5mm/day until innervation site is reached (or growth is blocked by fibrous tissue or bone) - New myelin sheath grows as axons ↑ diameter - As axons make contact with innervation site Paresthesia or Dysaesthesia can be experienced (burning pain frequently) -> This is a positive sign for healing

Prescription Writing

Compounding

= Preparation, mixing, assembling, packaging or labeling of a drug as a result of a practitioner's Prescription Drug Order AND for the purpose of research, teaching, analysis or based on regularly observed ordering patterns.

Gin and Tonic Example:

- Soda is the delivery medium for the prescribed medication -> Can be mixed with 1, 2, 3, 4, etc shots of Gin (the medicament) and/or with lime juice, cucumbers etc as modifiers or adjuvants

LA Example

- Adding bicarbonate to LA cartridge -> ↑ pH of fluid and makes it less painful on injecting

Format

Heading	Dr Demographics: - Name, Address, Age, Phone Number Pt demographics - Name, Address, Age, Phone number Rx Date
Body	Symbol "Rx" Name + Dosage form of drug Quantity dispensed (write the number fully, it's easy to add 0's) Directions to the Pt
Closing	Prescribers Signature College ID Number Refill Instructions

** Try to not use abbreviations -> They can be misread by Pt and pharmacists if you have messy writing (which you probably do unless you are Kelsey)**

- Be clear in directions: Write "Take every 8 hours" instead of "3 times a day" where patients might take all 3 doses at once and call it done like a pleb

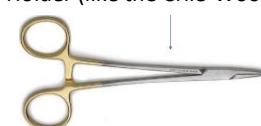
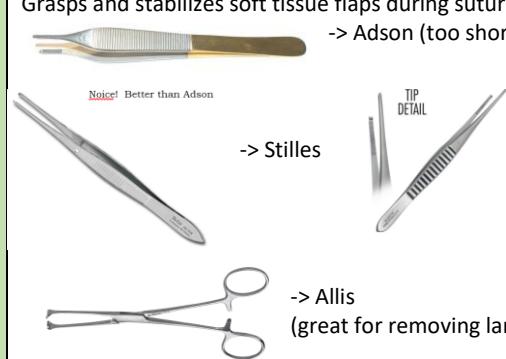
<u>Antibiotic Prophylaxis</u> (no Penicillin allergy) Rx: Amoxicillin 500mg Caps Disp: Four (4) capsules Sig: Take 4 capsules orally 1 hr before dental procedure	<u>Antibiotic Prophylaxis</u> (Penicillin allergy) Rx: Clindamycin 300mg Caps Disp: Two (2) capsules Sig: Take 2 capsules orally 1 hr before dental procedure. Recommend to take with probiotic yogurt
---	--

** If patient needing prophylaxis is coming back within a month, cannot Rx Amoxicillin again (worries about resistance) -> Give clindamycin for the next prophylaxis antibiotic**

The University of British Columbia Faculty of Dentistry Vancouver, B.C.
Phone: 822-8005 Date: Today's Date
Name: _____ Patient's Name Age: _____ Patient's Age
Address: _____ Patient's Home Address
RX
1. penicillin 300mg tab Dispense: 28 tabs Sig: Take 1 tab orally every 6 hours until finish
2. ketorolac 10mg tab Dispense: 8 tabs Sig: Take 1 tab every 6 hours prn pain, maximum 4 tabs (40mg) per day
Student: _____ Your Name & Phone Number
Faculty Signature: _____ Your Instructor's Signature
Print First Initial & Last Name: _____ Your Instructor's Name
College # _____ Your Instructor's Registration Number

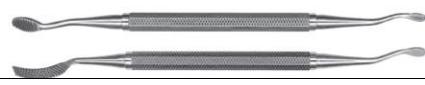
Drug Class	Generic Names	Common Trade Names	Common Dosage Forms	Common Quantity	Common Instructions *	Prescription?	Special Considerations
Analgesics	acetaminophen	Tylenol	regular strength = 325mg tab Extra strength = 500mg tab		1 or 2 tabs orally every 4-6 hour, do not exceed 4000 mg per day	no	
	ibuprofen	Advil, Motrin	regular strength = 200mg tab extra strength = 400mg tab prescription strength = 600mg tab		1 or 2 tabs orally every 4-6 hour, do not exceed 2400 mg per day	no	
	ketorolac	Toradol	10 mg tab		one tab orally every 6 hr prn pain, max 40 mg per day	yes	
	naproxen	Naprosyn	tablets: 250mg, 537mg, 500mg		250mg orally every 6-8 hours	yes	
		Tylenol #3	acetaminophen 300mg, caffeine 15mg, codeine 30mg		1-2 tabs orally every 4-6 hr prn pain	yes	
		Empracet-30	acetaminophen 300mg, codeine 30mg		1-2 tabs orally every 4-6 hr prn pain	yes	written Rx only, cannot phone in; does not require a duplicate Rx; no refills allowed; for patients who cannot tolerate caffeine in T#3
	codeine phosphate		30 mg tab		1-2 tabs orally every 4-6 hr prn pain	yes (duplicate)	duplicate Rx expires 5 days after the date written, e.g. if the Rx is dated on March 3, 2019, it expires on March 9, 2019 at 00:00 hours
	oxycocet	Percocet	oxycodone 5mg, acetaminophen 325 mg		1 tab orally every 6 hours prn pain	yes (duplicate)	duplicate Rx expires 5 days after the date written, e.g. if the Rx is dated on March 3, 2019, it expires on March 9, 2019 at 00:00 hours
		Percodan	oxycodone 5mg, ASA 325 mg		1 tab orally every 6 hours prn pain	yes (duplicate)	duplicate Rx expires 5 days after the date written, e.g. if the Rx is dated on March 3, 2019, it expires on March 9, 2019 at 00:00 hours
Antibiotics	penicillin		300mg tabs	7 days (28 tabs)	1 tab orally every 6 hours until finish	yes	if you want a loading dose, add one extra pill and ask the patient to: take 2 caps STAT, then, 1 cap po every 6 hours until finish
	amoxicillin	Amoxil	regular capsules: 250mg & 500mg chewable tabs in 125mg & 250mg liquid in 125mg/5mL or 250mg/5mL	7 days	adult infection: 250mg or 500mg orally every 8 hr until finish	yes	
				7 days	adult prophylaxis: 2g orally 1 hour prior to dental procedures paedo infection: 20-40 mg/kg/day (divide dosage into every 8 hours) paedo prophylaxis: 50mg/kg 1hr prior to dental procedures	yes yes yes	you need to do the calculations for the pharmacists; do not exceed adult dose you need to do the calculations for the pharmacists; do not exceed adult dose (2g)
	clindamycin		150mg or 300mg caps	7 days	adult infection: 150mg or 300mg orally every 6 hours until finish adult prophylaxis (allergic to pen): 600mg orally 1 hour prior to dental procedures	yes yes	if you want a loading dose, add one pill and ask the patient to: take 2 caps po STAT, then 1 cap every 6 hours until finish
					pedo prophylaxis (allergic to pen): 20mg/kg 1hr prior to dental procedures	yes	you need to do the calculations for the pharmacists; do not exceed adult dose (2g)
	metronidazole		250mg tabs	7 days	adult infection: 250mg or 500mg orally every 8 hr until finished		usually add to pen/amoxicillin for treating anaerobic bacterial infections; no alcohol!
Antifungals	nystatin		oral suspension 100,000 units/mL	7-14 days	squish and spit with 5mL solution QID for 7 days	yes	Calculate the volume you need; some prescribers may choose squish and swallow instead
	clotrimazole		10 mg lozenges	14 days	dissolve by mouth 5 lozenges a day for 14 days	yes	Available at a compounding pharmacy
Mouthwash	chlorhexidine	Peridex	0.12%, 475mL bottle	1-2 weeks	rinse with 15mL for 30 sec, 2 times/day	yes	
Anti-inflammatory	dexamethasone	Decadron	4mg tab	2-3 days	take 1 tab every 12 hours for 3 days	Yes	
	dexamethasone oral rinse	Decadron	0.4 mg/mL	4-5 days	Hold 5 mL in mouth TID for 3 minutes before meals	yes	Dispense 250 mL

Instruments

Begin surgery by making your incisions:						
Scalpel	 <ul style="list-style-type: none"> -> #12 -> #11 -> #15 <p>- #15 is most common - #11 used for small stab incisions (draining abscess) - #12 useful for mucogingival procedures w/ incisions in Max. tuberosity or posterior of teeth</p>	Scalpel Handles	 <p>#3 #5 #7</p> <p>Dr. Matthew loves the #5 **Place scalpel blade on/off the handle using a a Needle Holder (like the Crile-Wood)</p> 			
Now you need to elevate the mucoperiosteum						
<ul style="list-style-type: none"> Ideally you should reflect the periosteum from the cortical bone in 1 layer 						
Periosteal Elevator - Molt #9	<p>Detach Periosteum from bone/neck of tooth</p>  <p>Pointed end: begin the periosteal reflection and reflect papillae from between the teeth</p> <ul style="list-style-type: none"> - Twisting, prying motion <p>Rounded End: Continue the elevation of periosteum from bone</p> <ul style="list-style-type: none"> - Push stroke inserts broad end under periosteum (Pull strokes tent to shred/tear) 					
Retract the soft tissue back so you can see what's going on						
<ul style="list-style-type: none"> Austin and Minnesota are the 2 most popular 						
Tissue Retractor (Austin, Senn, Selden) - Minnesota works too	<p>Deflect and retract periosteum from bone</p>  <p>-> Austin -> Senn -> Selden (not awesome)....SEDOMLY used hehehe</p>					
Tongue and Cheek Retractor (Minnesota, Shuman, Weider, Mirror)	<p>Hold back tongue and cheek away from surgical site</p>  <p>-> Minnesota -> Shuman -> Weider (AKA: The Sweetheart) - Used for tongue only, and only use child size (adult size can cause bruising of the FOM)</p>		 <p>Mouth mirror</p>			
So you have done some things and now you need to grasp some tissue						
Tissue Forceps (Adson, Allis, Stilles, Gillies)	<p>Grasps and stabilizes soft tissue flaps during suturing and reconstructive procedures</p>  <p>-> Adson (too short for mouth) -> BAD BOIS Notice! Better than Adson -> Stilles -> Allis (great for removing large tissue, but causes lots of destruction)</p>		<p>-> Gillies (The best, proof that size DOES matter)</p>			

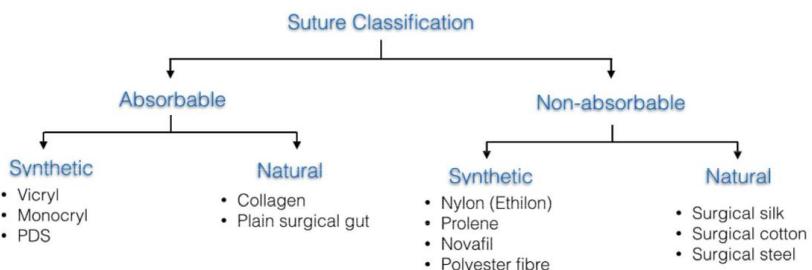
<p style="text-align: center;"><i>Shit...your patient is bleeding....</i></p> <ul style="list-style-type: none"> - Usually pressure on the wound does the trick -> but if it doesn't, grab one of these 	
Curved Haemostat	 <p>Securely hold small items, clamp blood vessels, remove small pieces of tooth/bone</p>
Surgicel	 <p>Oxidized Cellulose membranes Absorbs 7 – 10 times its own weight.</p> <ul style="list-style-type: none"> - Can be packed into the socket (Gelfoam becomes friable when wet and cannot be packed) <p>MOA:</p> <ul style="list-style-type: none"> - Act in the intrinsic pathway -> contact activation and platelet activation and, as absorbed, a gelatinous mass is formed, aiding in clot formation
Gelfoam	 <p>Porcine-derived collagen that is whipped into foam and then dried -> Gelatin</p> <ul style="list-style-type: none"> - It is available in sponge and powder forms and may be used as a stand alone or in combination with topical thrombin. <p>Absorbs the blood up to 40 times its weight and expands to 200% of its initial dimensions.</p> <ul style="list-style-type: none"> - Potential for 'overswelling' when used within small spaces, potentially causing damage. For this reason, it is not used intravascularly <p>Can apply Thrombin to the sponge for more direct clotting action -> skips the clotting cascade and converts fibrinogen to fibrin directly</p>
Collagen	 <ul style="list-style-type: none"> - Derived from bovine skin. <p>MOA:</p> <p>Bind tightly to blood surfaces to provide a matrix for clot formation and strengthening, as well as enhancement of platelet aggregation, degranulation and release of clotting factors = further promoting clot formation.</p>

Removing Bone

Rongeurs (Side Cutting, End Cutting)	<p>Cut and contour bone -> Remove sharp edges of alveolar crest and remove exostoses</p> <p>Side Cutting</p>    <p>End Cutting</p>  <p>-> Double action Rongeurs have 2 hinges, but when you are using them in the posterior you can nip the lips or tongue and leave a nasty wound</p>
Burs and Handpieces	<p>Best = High speed, high torque w/ sharp carbine burs</p> <ul style="list-style-type: none"> - FG1702S 😊 - DON'T use restorative burs, they suck for this <p>Handpiece Requirements:</p> <ol style="list-style-type: none"> 1. Completely sterilisable 2. High speed and torque 3. NO exhausting air into operative field (normal restorative handpiece is bad for this) <ul style="list-style-type: none"> - Air exhausted into wound can be forced into deeper tissue and produce Tissue Emphysema 
Bone File (Straight or cross cut or curved)	<p>Smooth bone for better contour of alveolar ridge (after rongeur)</p>  <ul style="list-style-type: none"> - Usually double ended (small + large end) - Cannot efficiently remove lots of bone - Effective stroke is the pull -> Don't push (will burnish and crush)
Curette	<p>Used for removing soft tissue from bony cavities -> Granulomas or small cysts</p>  <ul style="list-style-type: none"> -> Angled -> Molt

Suturing Soft Tissue

Needle Drivers (Crile wood is best for surgery)	Holds Suture Needle -> Like hemostat, but with concave area inside each beak <ul style="list-style-type: none"> - Beaks are shorter + stronger than hemostat and crosshatched texture helps grip the needle...NEVER USE THE HEMOSTAT FOR THIS  <p>These are the Castroviejo , they are garbage</p>  <p>Crile-Wood is good!</p>
Suture Needle	 <ul style="list-style-type: none"> - Comes as small 1/2 circle or 3/8 needles -> Curve helps it pass through tight spaces - Triangular tips make them cutting needles -> Passes through tissue easier (cutting portion is 1/3rd the length of the needle)
Sutures	Lots of materials are available, classified based on: <ul style="list-style-type: none"> - Diameter (designated by series of O's) -> 3-0 (Three O) is good for oral mucosa - Resorbability <ul style="list-style-type: none"> - Gut (from sheep intestines) resobs quick (3-5 days) - Chromic Gut (coated in chromic acid) = 7-10 days to resorb + ↑ handling - Synthetic resorbable (Polyglycolic) = 4 weeks to resorb -> Vicryl Rapide resorbs in 2 weeks 😊 - PTFE Cytoplast (Gore-Tex) is best synthetic Non-resorbable - Monofilament or polyfilament <ul style="list-style-type: none"> - Mono: Nylon (Ethilon), Monocryl, Plain Gut, Chromic Gut, PTFE. No wicking 😊 - Poly: Silk, polyglycolic acid, Polylactic acid. Braided together, easy to tie BUT wicking oral fluids/bacteria into underlying tissues 😞
Scissors	Short cutting edges <ul style="list-style-type: none"> - Dean Scissors have slightly curved handle (for no real reason) 



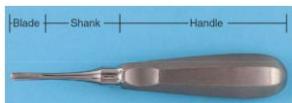
Misc Items that you also need

Mouth Prop	 <p>Supports the mandible to prevent undue stress on the TMJ <ul style="list-style-type: none"> - Only use child size even on adults! </p>
Molt Mouth Prop	This can be used if you need the mouth to open wider -> it sucks though, super slippery <ul style="list-style-type: none"> - Ratchet type action -> Can really fuck up the TMJ though! Caution 
Suctioning - Coupland, Fraser, Yankauer	Have smaller orifices for ↑ fluid evacuation from surgical site  <p>-> Coupland – if gets clogged, reverse it and it will be fixed</p>  <p>-> Fraser – There is a hole in the handle. Cover it for ↑ fluid suction during hard tissue cutting. Open hole to prevent soft tissue injury</p>  <p>-> Yankauer – Disposable is best! The replacement tips of the non-disposable can come loose and fall into Pt's throat... <ul style="list-style-type: none"> - Usually just used to clear deep in the throat for pt's under GA </p>

Towel Clip		Used to hold the towel draped around the Pt -> Be VERY careful to not pinch the skin under the towel
Irrigation		Can use sterile water or saline -> Cools bur and prevents bone damaging heat. Also lubricates and washes away cut tissue for ↑ efficiency -> Use monojet to thoroughly irrigate under flap

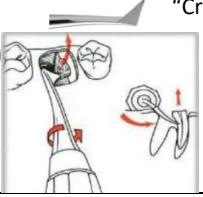
Extracting Teeth

Elevators have Blade, Shank and Handle

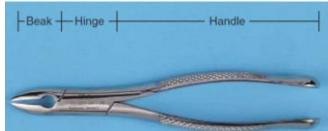


- Usually handle has good girth to it to be comfy but allow controlled force
- Shank connects the handle to the working end
- Blade – Working tip. Transmits force to the tooth or bone

There are 3 General types of elevators:

Straight - 301, 77R, 34S - Miller, Potts	301 = most common elevator 77R and 34S are nice also with a little curve 😊 Angled shanks allow the use in more posterior areas - Miller and Potts elevator	
Triangular - Worrack James - Cryer	Useful when broken tooth remains in the socket, and the adjacent socket is empty “Cryer” is AKA “East-West Elevator”  **Very Important to use a “Wheel-Axle” motion to elevate the root tips. Don’t fulcrum the shank off the bone -> This is a Class 1 level and will break your patients shit	
Pick - Crane Pick - Double Ended	Used to remove roots -> Usually have to drill a hole with a bur to create a purchase point (3mm into root) - Using buccal plate as a fulcrum, insert the tip into the purchase point and elevate 	 -> Very delicate movements. Don’t use like a Cryer or Crane with Wheel-Axle movements
Periotome (BONUS, he is a mad man!)	 Used to extract teeth while preserving the anatomy of the socket -> Sever the periodontal ligament of the tooth - Tip inserted into periodontal ligament and pushed apically 2-3mm. Remove and repeat in the adjacent area. Work around the tooth gradually going deeper and deeper each round	

Extraction Forceps



- Beaks are designed to adapt to the tooth root near the CEJ. NOT the crown

53R, 210S	53R	150	1	1	150	53	53 , 210S
18	17	16	15	14	13	12	28
48	47	46	45	44	43	42	38
21, 73	21, 73, 86, 87	151, 74		151, 74	21, 73, 86, 87	21, 73	

Maxillary Forceps			Mandibular Forceps		
#1 (Max. Anteriors + Canines)			#74 Ash (Man. Root Tips and anteriors)		
#150 (Max. Anteriors and Premolars)		Universal (R +L)	#151 (Man. Anteriors + Premolars)		(Universal R+L)
#53 R/L (Right Max. Molars)		Round Beak contours lingual root Pointed back contours bifurcation of buccal roots *#53 = straight handle*	#86/87 – Cowhorn (Ma. 1 st + 2 nd molars) #86 is English side action		- 86 English side action - 87 Cow Horn
#88R/L (Max. 1 st and 2 nd molar)		Bayonet Beak Beak w/2 projections contours lingual root	#73 Ash (Man. Molars)		
#210 (Max. 3 rd Molars)		Universal (L + R)	#222 (Man. 3 rd Molars)		
#65 + #69 (Max. Overlapping Anteriors / Root Tips)		Very Narrow beaks -> #69 doesn't have contra-angled head			

Pediatric Forceps

50S	1	1	150S
55	54	53	52 51 61 62 63 64 65
85	84	83	82 81 71 72 73 74 75
151S		151S	

Physics Forceps

- The new coolness
- Silicone bumper protects the buccal plate while the hook rotates the root out of the socket

Maxillary Forceps			Mandibular Forceps		
#1 (Max. Anteriors + Canines)			#151s (All mand)		
105s (Max. Posterior)			#16s (Mand. Posterior)		Peds cowhorns - Calf horns? :P

Tray Setup



Featuring:

- LA Syringe + Needles + LA
- No. 9 Molt Periosteal elevator
- Periapical curette
- Small + Large elevator (301, etc)
- Curved Haemostat
- Towel Clip
- Minnesota Retractor
- Suction Tip
- 2x2 and 4x4 gauze
- The Required forceps -> Tissue and Extraction

Professional Negligence and Informed Consent

Professional negligence = subset of general rules of negligence

3 elements of Negligence:

1. Professional owes "a duty of care" to the claimant
2. Duty was breached
3. Breach caused loss or injury that should be compensated in damages

The Standard of Care = The care which a reasonable and prudent practitioner would do under the same or similar circumstances

- Once we graduate we are held to the same standard of care as someone 30 years into practice....be diligent!

Classic Dental Negligence Claims	
Poor Craftsmanship	<ul style="list-style-type: none"> - Faulty crowns/bridges - Cuts to patients lips and tongue - Fractured root tips remaining after extraction - Chemical burns
Inattention to patient and/or records	<ul style="list-style-type: none"> - Extraction of wrong tooth - Failure to diagnose cavities and/or perio - Problems with TMJ - Paresthesia due to extrusion of endo sealers and medicaments - Failures from not obtaining a full Med Hx
Communication Breakdown	<ul style="list-style-type: none"> - Failure to obtain informed consent - Failure to inform patients about problems during procedures
Injuries because of treatment	<ul style="list-style-type: none"> - Infection after tooth removal - Aspiration of foreign objects dropped in mouth
Working out of our scope as generalists	<ul style="list-style-type: none"> - Failure to refer patients to specialists to obtain second opinions - Performing work outside of expertise

When a Problem Arises

Do's	Don'ts
<ul style="list-style-type: none"> - Remain Calm - Notify your professional liability program immediately - Instruct staff not to speak with anyone about the incident 	<ul style="list-style-type: none"> - Admit liability for the alleged error - Ignore it and assume it will go away - Contact a patient who has started a lawsuit against you - Talk to the Pt's lawyer -> Refer them to your insurer or lawyer - Treat the patient after the suit begins (unless emergency) - Seek info about the patient from other providers - Give away original records - Alter the notes or add anything to patients record (Especially if it pertains to the legal action!)

Informed Consent

= Legal concept that is given by a patient to a doctor for Tx with **full knowledge of the possible risks and benefits**.

- Patient must be educated by dentist in order to make a reasonable choice
- Dentist is legally and ethically obligated to treat a patient within the limits of the consent provided -> May avoid liability and damages for battery if you can provide evidence of a valid consent

Disclosure Standard

= Medical provider is required to **disclose to the patient the nature of the proposed operation, its gravity, any material risks and any special or unusual risks attendant upon the operation**

- **3 Components:**

- o Was the risk material unusual or special?
 - **Unusual or Special** = Rare, known to occur only occasionally -> in comparison to material risk these are less dangerous and not frequently encountered
 - **Material** = Subjective concerns and unique nature of each individual patient also determines materiality of a risk
 - **Risks that are unlikely must still be explained to the patient if they have serious effects**
 - **Risks with minor effects must be explained as well if it will probably happen**
 - o Should the doctor have disclosed that risk?
 - o Did the breach of the duty cause the plaintiff's damages?

Considerations for Materiality

- Inherent risks of Tx
- If the Tx consequences are serious
- Frequency of risk
- Information normally given to patients undergoing the same procedure
- Gravity of the patient's condition
- Importance of the benefit of the Tx
- Any need to encourage the patient to accept treatment
- Intellectual and emotional capacity of the patient
- Info the Doctor knows (or should know) that patient deems relevant to their decision in choosing treatment
- Evidence from the patient for the information they wanted to know before electing a certain Tx

Examples

- The odds are 1/100,000 wisdom teeth extractions that a jaw fracture will occur
 - o Low risk = no warning is required
- If there is significant chance of a slight injury -> Risk is "material" and needs to be disclosed

KEEP COMPLETE RECORDS

- Progress notes containing **full and complete** information show the judge that the patient was aware of his or her condition and is responsible for their choice to have the Tx provided

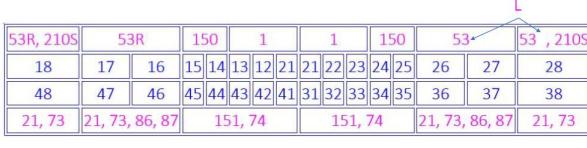
Dental Record includes	<ul style="list-style-type: none">- Treatment Notes- Emails- Text Messages- X-Rays- Casts- Study Models- Tracings- Molds- Impressions- Photographs made of the patient in the course of treatment
Things to Include in the Record	<ul style="list-style-type: none">- Patients name and contact info- Tx dates and missed appointments- Up-to-date med and dent Hx- Allergies and medications- Chief Complaint- Patient expectations- Clinical findings and impressions- Differential Dx- Tx plan (including explanations given to patient)- Informed consent notes and documents- Notes regarding complications (known or suspected) and side effects from Tx or meds- Recommendations or referrals- Tx performed- Consultation with referrals

Principles of Routine Exodontia

Indications	<ul style="list-style-type: none"> - Unrestorable caries <ul style="list-style-type: none"> - The crowns will be soft and easier to crumble, try to luxate as much as possible first - Periodontal Disease <ul style="list-style-type: none"> - Easy to extract but ↑↑ bleeding - Orthodontic reasons -> Count the teeth! Make sure nothing has changed since last x-ray, if you fuck up the ortho plans will need to change - Failed Endo - Associated pathology (odontogenic cyst or neoplasm)
History	<p><u>Important medical conditions to consider</u></p> <ul style="list-style-type: none"> - Hypertension <ul style="list-style-type: none"> - ↑ Bleeding - LA can ↑ BP further = risk of stroke! - Type 1 DM <ul style="list-style-type: none"> - ↑ infection risk - ↓ wound healing - Hypoglycemia risk - Bleeding Disorders <ul style="list-style-type: none"> - Know which kind - Obtain INR within 24 hours of surgery if you can - Anticoagulant drug Therapy <ul style="list-style-type: none"> - Warfarin (Get INR) - Pradaxa (Dabigatran) -> Direct Thrombin inhibitor - Eliquis (Apixaban) -> Reversible inhibition of factor Xa - Xarelto (Rivaroxaban) -> Reversible inhibition of factor Xa <ul style="list-style-type: none"> - *These are taken for Atrial fib and stroke risk -> Never stop these meds! They don't actually bleed THAT much* - Immunosuppressant Drug therapy <ul style="list-style-type: none"> - Consider Ab. Post surgery to compensate for immune compromise - Co-existing cardiac disease, Prosthetic heart valve <ul style="list-style-type: none"> - Follow Prophylactic Endocarditis protocols - Bisphosphonates <ul style="list-style-type: none"> - Risk of ONJ -> Mostly with oral meds if taken for 3 years - Give Ab and CHX a few days prior to surgery -> Try to ↓ bacterial load to ↑ chance of healing <p><u>Important things to Inquire about:</u></p> <ul style="list-style-type: none"> - Previous anesthesia issues or difficulties - Previous Extraction difficulties - Post-Op bleeding problems - Pre and Post-op. Infection problems
Radiographs	<ul style="list-style-type: none"> - If X-ray older than 1 yr = Retake - Must include a Pan (can miss things with PA) <p><u>Things that make you happy to see</u></p> <ul style="list-style-type: none"> - Single root configuration (conical with nice broad apex) - Well-defined Periodontal Space (lamina dura) -> No ankylosis ☺ - Loss of alveolar bone height (Advanced Periodontal disease) -> Loose teeth! <p><u>Things you are sad to see</u></p> <ul style="list-style-type: none"> - Hypercementosis - Root Resorption - Submergence and ankylosis - Impaction and Ankylosis - Complex tooth formation (Large mega teeth) - Erosion - Critical anatomical structures in close proximity
Patient Assessment	<p><u>Level of Cooperation</u></p> <ul style="list-style-type: none"> - Mental status - Physical Status - Patient's previous experience - Patient's apprehension and confidence in your abilities - Anesthesia options (Local, Nitrous, Oral sedation, IV sedation, GA) <p>**Must display quiet unhurried confidence**</p>
Clinical Examination	<p><u>General Build</u></p> <ul style="list-style-type: none"> - Ethnic variations in bone densities -> African descent = THICCCCC bone - > 50 yrs old also dense bone and strong PDL attachment (Surgical extraction typically needed) <p><u>Bone Structure</u></p> <ul style="list-style-type: none"> - Older Patients may have brittle tooth roots within dense sclerotic bone -> Root will break before buccal plate flexes <p><u>Mouth Opening</u></p> <ul style="list-style-type: none"> - Tough access in children/adults with small mouths and in patients with TMJ, Infection or collagen disorders

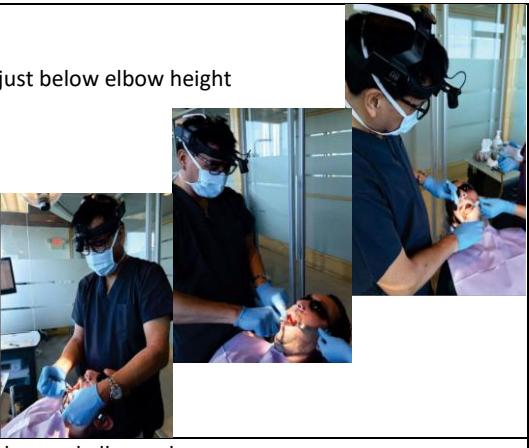
Pain and Anxiety Control	Pain Control																																																
	<ul style="list-style-type: none"> - Obviously essential to freeze teeth and soft tissues - Apprehension may ↑ perception of pain (Pain vs Pressure) 																																																
	Pre-Extraction Analgesia																																																
	<ul style="list-style-type: none"> - 800mg x 1 Ibuprofen (Max dose 3200mg/day) q4h - 500mg x 2 Acetaminophen (Max 4000mg/day) q4h 																																																
	Anxiety Control																																																
	<ul style="list-style-type: none"> - Confidence is key! - Sedation Options: <ul style="list-style-type: none"> - Oral Sedation (Triazolam, Lorazepam) -> Tiazolam is best (1/2 life = 3-6hrs), place sublingual for fast absorption - Nitrous Oxide, - IV Sedation (Mild, Moderate, Deep) -> Medazolam Fentanyl - General Anesthesia 																																																
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Instrumentation for Simple Exodontia

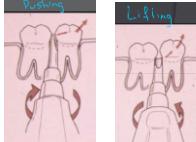
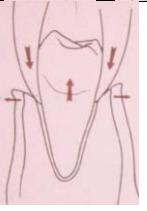
Mouth Mirror/Retractors	 Mouth mirror	 Minnesota	 Shuman	 Weider (Sweetheart)																																
Dental Probe	I hope you know what this is...																																			
Gauze	Also this <ul style="list-style-type: none"> - Create a throat pack (with 4x4) to protect the airway from fragments that might fall in 																																			
Bite Blocks/Molt Mouth Prop	**Child Bite blocks only!** <ul style="list-style-type: none"> - Allows for a relaxing pain-free opening - ↓ Stress on TMJ and muscles 																																			
Periosteal Elevator	 Molt #9 is king																																			
Dental Elevator	 Straight Pattern - #301  Pointed Pattern - Crane Pick (Roots)  Curved Pattern - #77R, or Potts  Triangular Pattern - Cryer																																			
Extraction Forceps	This Again... Maxillary: <ul style="list-style-type: none"> - Upper Universal = 150 - Max. Molars = 53R and 53L Mandibular: <ul style="list-style-type: none"> - Lower Universal = 151 - Ash Forceps or English -Style Side action 																																			
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	<ul style="list-style-type: none"> - Cowhorn = 23
Periostomes	<p>These are very thin fins that you insert gently between the tooth and the bony socket in order to separate the periodontal ligament fibers -> Makes it much easier to extract the tooth after</p> 

Surgical Ergonomics

Chair Position	<p>Maxillary Extractions</p> <ul style="list-style-type: none"> - Chair back so the occlusal plane is ~ 60° to the floor - Chair should be high enough for patients' mouth to be just below elbow height - Turn patients head towards you <p>Mandibular Extractions</p> <ul style="list-style-type: none"> - Patient more upright (vs max.) - Occlusal plane parallel to the floor - Turn patients head towards you <p>The Old Mandibular Reach Around (posterior approach)</p> <ul style="list-style-type: none"> - Surgeon stands behind pt. -> allows left hand to support the mandible - Hold the forceps "underhand" 	
Stance/Posture	<ul style="list-style-type: none"> - Arms should be close to your sides -> Keep those shoulders and elbows down - Wrists straight -> Allows the force to be delivered with the arms and shoulders (not the hands and fingers) - No leaning 	

Mechanical Principles

Elevators	<p>Lifting and Pushing</p> 	<p>Wedging (Placing into the PDL space to displace the tooth out)</p> 
Forceps	 <p>Wedging</p> <ul style="list-style-type: none"> - Narrow tips are pushed apically (into PDL space) -> Expands the bony crest and displaces the tooth occlusally 	<p>Forces used to Mobilize a Tooth</p> <ol style="list-style-type: none"> 1. Apical Pressure -> Breaks the Periodontal Seal 2. Forces to break Periodontal Fibers -> Buccal Force (Expands the buccal Plate), Lingual Force (Expands Lingual Crest), Rotational Force (Overall expansion of the socket) <ul style="list-style-type: none"> - Be careful with the B and L forces: Tooth rotates along a central axis, so when you pull the tooth buccally the root pushes lingually (and vice versa) -> If you go too hard you can snap the root 3. Traction force -> Delivers the tooth out of the socket 

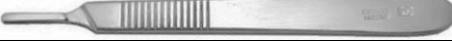
<u>Indications for Leaving Root Tips</u>
<ul style="list-style-type: none"> - ↑ risk of displacing root into anatomical space - High risk of adjacent nerve or vessel injury - Patient is over it - The risk of taking it out weighs the risk of leaving it in - <5mm in size

Principles of Complex Extractions

Progress Notes	
- Always follow the complete SOAP w/ Dr. Choi (Especially the "A")	
S – Subjective	<ul style="list-style-type: none"> - Chief Complaint - Symptoms - Duration of complaint
O – Objective	<ul style="list-style-type: none"> - Exam Findings (Clinical, perio, endo etc) - Studies (X-rays, CBCT, Vital)
A – Assessment	<ul style="list-style-type: none"> - Determines your diagnosis or differential - Based on the S and O findings - Guides your Tx Plan - "Why" you are going forward with extraction
P – Plan	<ul style="list-style-type: none"> - Proposed Tx Plan - Include Tx options - Risks and Benefits or proposed plans
T – Treatment	<ul style="list-style-type: none"> - Detailed account of Tx provided - Mentions Informed Consent obtained - Includes Instruments, Meds and techniques used - Post Op Instructions and Prescriptions

<u>Indications for Exodontia</u>
<ul style="list-style-type: none"> - Unrestorable caries and fractures - Periodontal Disease - Failed Endo therapy - Ortho Extractions or impacted teeth - Supernumerary Teeth - Associated pathology - Patient choice (sometimes this isn't the best one though) - Facial Trauma - Malignant oral neoplasia requiring extractions (before radiation or chemo)

Instrumentation for Complex Exo

Everything needed for Simple Exo PLUS	
Surgical Handpiece with bur	Burs: FG701, or 702 Handpiece: No air! Can cause surgical emphysema
Scalpel Blade and Handle	#15 Blade with a #3, or #5 handle is a nice tasty combo 
Needle Holder	DON'T use the haemostat or you will get shit on <ul style="list-style-type: none"> - These bois have cross hatching at the tip which ↑ their grip on the suture needle 
Suture and Scissors	3-0 is pretty standard for Dentistry 3/8ths or 1/2 circle reverse cutting needles are also pretty standard
Curettes	Used to clean out granulation tissue and debris from the extraction sockets (used in simple Exo as well actually) <ul style="list-style-type: none"> - 84, 85, 86, 87 Lucas Surgical Curette - 10, 11, 12, Miller Surgical Curette 
Root Tip Picks - JUST the tip...(just to see how it feels)	<ul style="list-style-type: none"> - 13/14 Heidbrink Root Tip Pick - 94 and 95 Root tip pick <p>**Only for extracting broken root tips, not for full roots, you will bend the shit out of it if the root is too large**</p> 
Tissue Pliers	<ul style="list-style-type: none"> - Semkin-Taylor - Adson - Adson-Brown 

Luxators	<ul style="list-style-type: none"> - These are like small elevators that you use with tiny movements in a pen grasp - NOT Periotomes 		
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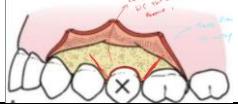
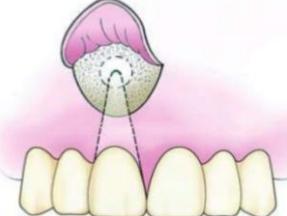
Principles of Flap Design

There are 5 principles:

1. It is *outlined by a surgical incision*
 - Clean and down to the bone (include the periosteum in the flap)
 - Keep interdental papilla intact
2. Carries its *own blood supply*
 - Broad base (wider than it is high)
3. *Allows surgical access* to underlying tissues
 - Reflect and retract carefully to avoid ischemia and tearing
4. Can be *replaced in its original position*
 - Replace on sound bone, not a bony defect or over an empty space
5. *Maintained with sutures*

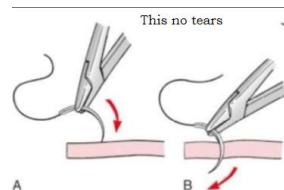


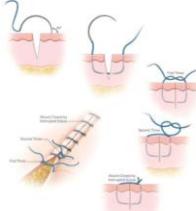
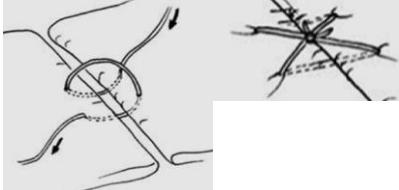
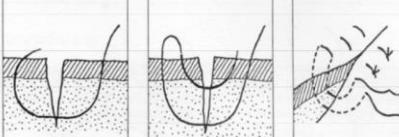
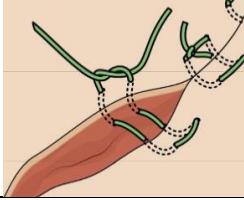
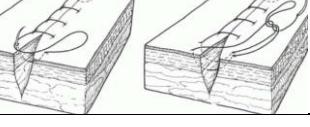
Types of Flaps

Envelope Flap	Incise the bottom of the sulcus around all the teeth you will be reflecting. Keep the papilla intact <ul style="list-style-type: none"> - Reflect with a Molt #9 Periosteal Elevator 
3 Corner Flap	 Add 1x releasing incision anterior to the target tooth <ul style="list-style-type: none"> - Place releasing incision at the line angle of the tooth, not in the middle or a tooth (recession), or the middle of the papilla (recession)
4 Corner Flap	 2x releasing incisions (Anterior and posterior to the target tooth) <ul style="list-style-type: none"> - Usually you don't need this kind of retraction for a simple exo, you can get by with a 3 corner
Subsulcular Flap	Make the envelope incision below the bottom of the sulcus (but still on keratinized tissue) -> Prevents recession! 
Semilunar Flap	 - Used pretty much only for Apicoectomy

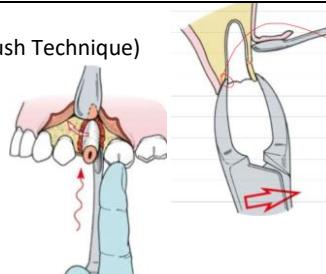
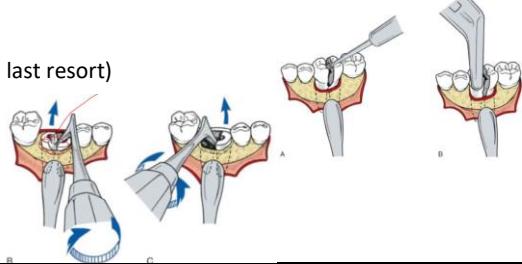
Principles of Suturing

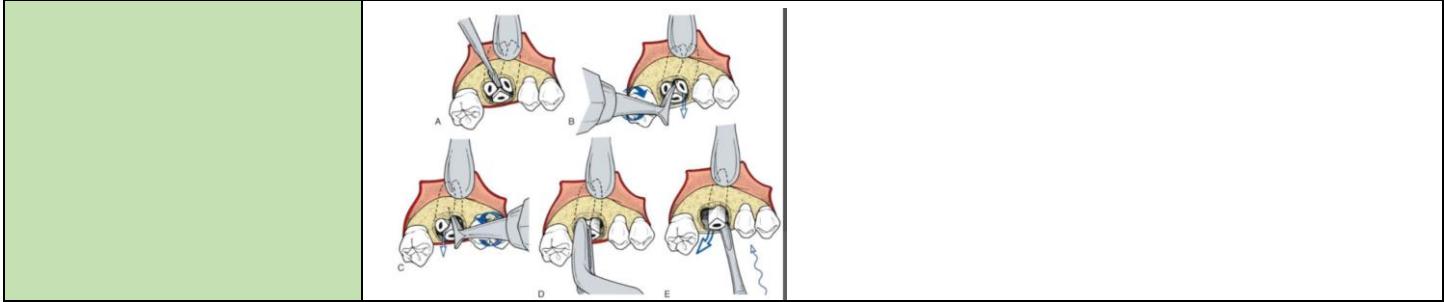
1. Inset needle 2-3mm away from the wound edge
2. Needle enters the soft tissue at a 90 degree angle
3. **Rotate the needle** through, don't push it!
4. Start from **moveable tissue into non-moveable tissue**
5. Approximate the tissue and do not strangulate it when tying the knot



Suturing Techniques		
Interrupted Suture		Pretty much the top dog suture that we will be doing mostly <ul style="list-style-type: none"> - Simple and effective
Figure of 8		Useful for locking a blood clot or PRF into a socket
Vertical Mattress		Great for re-approximating the papilla <ul style="list-style-type: none"> - Keeps suture within the papilla tissues, so there is no tension on the surface that might cause recession
Horizontal Mattress		Kinda like a figure 8, but without the cross over <ul style="list-style-type: none"> - Can bring deeper tissues closer together - Moves the tension further away from the incision
Continuous (Non-locking)		Quick and dirty, but you better make sure it doesn't come untied or the entire thing will come undone
Continuous Locking		Creates a little lock with each pass, allows you to tension one section at a time as you go. Doesn't prevent the entire thing from coming undone if you knot it poorly though

Complex Extraction Techniques

Single Rooted Teeth	<p>Create a flap for better visuals Use forceps and grasp through a lip of bone to engage the root (County Crush Technique) OR Section the root with surgical handpiece and use luxators OR Remove bone (Mesial, then distal, and if you have to Buccal)</p> 
Multirooted Teeth	<p>Create a flap Section the tooth to isolate the roots Remove bone if needed (Mesial, Distal, and buccal as a last resort) Can use a Cryer or Crane to elevate the root tips</p> 



** When extracting multiple teeth: Start from the distal and move mesial**

Principles of Managing Impacted Teeth

Causes of impaction

- Inadequate arch length
- Adjacent teeth
- Dense overlying bone
- Excessive soft tissue
- Genetic abnormalities

The most impacted teeth are:

- Max. and Mand. 3rd molars
- Max. Canines
- Mand. Premolars

****Early detection is so important****

- Prevents problems from occurring later on
- Allows for possibility of ortho solution
- Prevents possible need for extracting more than 1 tooth due to issues arising later on
 - o Impacted 8's can cause external root resorption of the 7's 😞 They both need to go
 - o Can cause Periodontal disease involving the adjacent



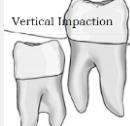
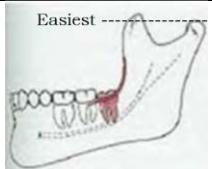
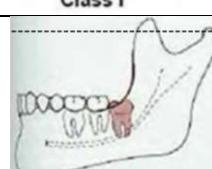
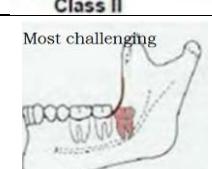
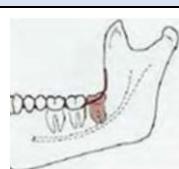
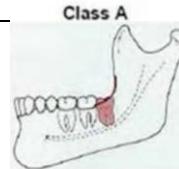
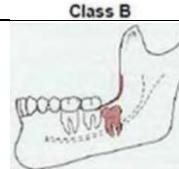
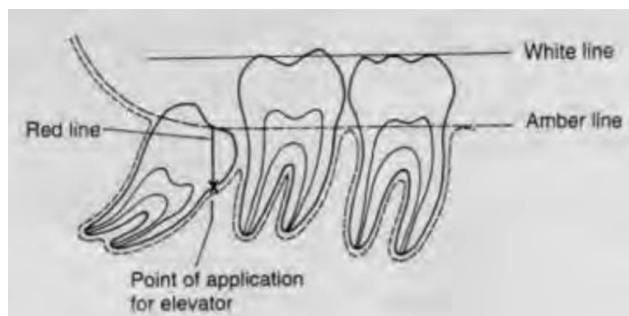
Indications for Impacted tooth removal	<ul style="list-style-type: none"> - Pericoronitis - Caries - Periodontal disease - Root Resorption of adjacent teeth - Prevention of jaw fracture - Management of associated odontogenic cysts and neoplasia - Orthodontic considerations - Before orthognathic surgery - Under dental prosthesis - Systemic health considerations
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Angulation Classification for 3rd Molars

Maxillary 3rd Molars

- Vertical and Distoangular are less complicated to remove

Mandibular - IAN Canal, and Lingual nerve considerations	Maxillary - Sinus and Tuberosity considerations
Mesioangular  43% of Mandibular 3 rd molar impactions <ul style="list-style-type: none"> - Easy to remove 	Mesioangular <ul style="list-style-type: none"> - 12% of impactions - Challenging b/c thickness of bone and 2nd molar position
Vertical	Vertical <ul style="list-style-type: none"> - 63% of impactions - Less complicated

 Vertical Impaction	38% of Mandibular 3 rd molar impactions - Can be easy to remove - Can be hard depending on the Pell/Gregory Classification	
Distoangular  b Distoangular	6% of mandibular 3 rd molar impactions	Distoangular - 25% of impactions - Less complicated
Horizontal  c Horizontal	3-13% of mandibular 3 rd molar impactions	Horizontal/Inverted/Transverse/Palatal - Very rare, 1%
Pell/Gregory Classification - Relationship to the anterior border of the ramus		
Class I	 Easiest	Sufficient room anterior to the anterior ramus to erupt
Class II	 Half of the impacted tooth is covered by the ramus	
Class III	 Most challenging	3 rd molar is completely embedded in the ramus
Pell/Gregory Classification Again - Relationship to occlusal plane		
Class A	 Occlusal Surface level w/ 2nd molar	Winters Lines <u>White Line</u> : Occlusal plane of 1 st and 2 nd molar <u>Amber Line</u> : Crest of bone distal to 7, and interdental bone btwn 6/7 <u>Red Line</u> : Perpendicular line from Amber down to mesial surface of impacted 8 <i>Used to determine the depth of impaction</i>
Class B	 Occlusal surface is between occlusal plane and cervical line of the 2nd molar	
Class C	 Occlusal surface is below the cervical line of the 2nd molar	 White line Amber line Red line Point of application for elevator

Factors ↑ difficulty of 3rd molar removal		
- Older Age		- Poor anaesthesia

- | | |
|---|--------------------------|
| - Dense calcified bone (\downarrow flexibility) | - Atrophic mandible |
| - Dilacerated Roots | - Limited Access |
| - Apical root of Mand. 3 rd molar in cortical bone | - Location of Max. Sinus |
| - Position of the IAN | - Strong gagger |
| - Superiorly positioned Max. 3 rd molar | - Large tongue |
| - Adjacent teeth damage during removal | |

IAN nerve damage is actually not super scary (if patient is young)

- As long as you don't cut the nerve mechanically the numbness will go away

Swelling damage can cause nerve damage though

Oroantral Communication	
Risk Factors	<ul style="list-style-type: none"> - Pneumatized Max. sinus - Divergent roots - Minimal bone between the roots and the sinus
How to avoid	<ul style="list-style-type: none"> - Avoid apically directly pressure - Adequate preoperative radiographs
Diagnosis	<p>DON'T probe the communication -> Makes it worse</p> <ul style="list-style-type: none"> - Examine the root tips for attached bone - Examine the extraction site - Nose-Blowing test - Airflow into the mouth - Fluid flow into the nose <p>If you see anything other than black in the socket, then you are ok 😊. There is still sinus covering the hole -> Black is bad</p>
Tx	
<p>Small (<2mm)</p> <ul style="list-style-type: none"> - No Tx, sinus precautions only <p>Medium (3-6mm)</p> <ul style="list-style-type: none"> - PRF - Gelfoam or Surgicel in the socket <p>Large (>7mm)</p> <ul style="list-style-type: none"> - Refer to oral surgeon for flap closure 	

Radiographs

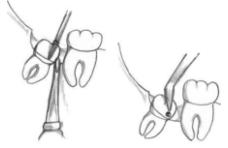
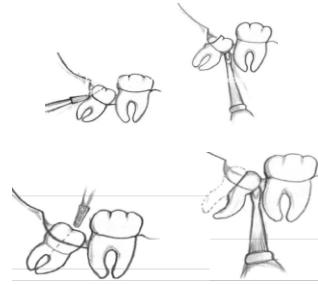
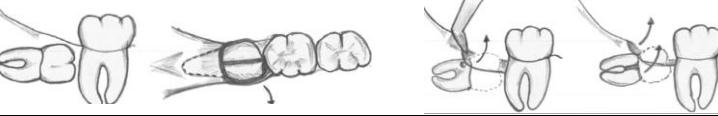
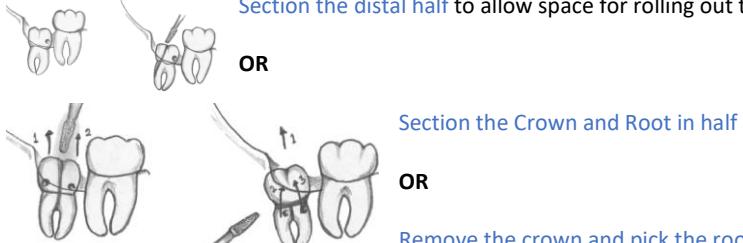
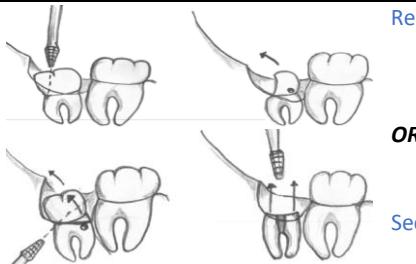
Panoramic Films	Aid us in: <ul style="list-style-type: none"> - ID the presence of 3rd molars - Locate unusual positions of teeth - Facilitate in establishing their angulation - Shows vertical relationship to second molar - Identified caries and dentoalveolar bone loss (kinda) - Detect the location of the IAN Canal - Detect bone pathology - Establish the height of the mandible - Show the relationship for the Max 3rd and Max sinus - ID the structural stability of the second molar - Locate the relationship of root apices w/dense bone - Detect dilacerated roots
Cone Beam CT	<p>Using 3D radiographs with a Focused Field of View (FOV)</p> <ul style="list-style-type: none"> - 50mm = Makes positioning easy and ensures the tooth you want is always captured - 37mm vertical size = Captures 1 jaw at a time to \downarrow the irradiated surfaces <p>For posterior point-out the tooth directly For anterior point-out beyond the incisors</p> <p>37mm 60mm</p> <p>Half this tooth is poking out of the lingual bone (Pan can't show us this)</p>

Risk Assessment for 3 rd Molar Extraction	
- Age - Location of IAN - BMI - Drug Hx - Anaesthesia Hx - Systemic conditions - Surgical Access Space - Smoking	- Tongue Size - Max. Sinus location - Root Contour - 3 rd molar position - Inter-incisal opening - Health of 2 nd molar - Bone mass and Density - Poor oral hygiene
Risk of IAN Damage	<ul style="list-style-type: none"> - Superimposition of the IAN canal and the 3M root with Narrowing of the IAN canal - Darkening of the 3M root over the IAN canal - Diversion of the IAN canal or loss of the white cortical outlines of the canal <p>Baseline risk of IAN damage is only ~1% -> Combinations of the above factors ↑ risk from 1.4-12%</p>
Classifications of Nerve Damage	<p><u>Neuropaxia (1st degree)</u></p> <ul style="list-style-type: none"> - Cause: Minor compression or Traction injury - Healing: Spontaneous recovery <2months <p><u>Axonotmesis (2nd degree)</u></p> <ul style="list-style-type: none"> - Cause: Crush or Traction Injury - Healing: Spontaneous recovery 2-4 months, up to 1 year <p><u>3rd Degree Injury</u></p> <ul style="list-style-type: none"> - Cause: Traction, Compression, Crush - Healing: Some spontaneous (not complete recovery) -> Microsurgery indicated if not improved by 3 months <p><u>4th Degree</u></p> <ul style="list-style-type: none"> - Cause: Traction, Compression, Injection, Chemical - Healing: Not likely for spontaneous recovery -> Microsurgery after 3 months if no improvement <p><u>Neurotmesis</u></p> <ul style="list-style-type: none"> - Cause: Transection, Avulsion, Laceration - Healing: Extensive fibrosis, neuroma -> Microsurgery needed after 3 months
If injury happens	<p>Recovery: Typically 6-8 weeks</p> <p>Total recovery: 6-9 months (could be up to 18 months)</p> <ul style="list-style-type: none"> - Younger patients recover very well (<25 years old)

Surgical Technique

1. Anaesthesia	<ul style="list-style-type: none"> - IAN + Long Buccal + Infiltration - Gow-Gates Block - Akinosi Block if Trismus <p>*Don't use 4% Articaine for Block, ↑ risk of Lingual nerve Paresthesia*</p> <p>- This is kind of contested in the literature though...also by Dr. Esmail</p>	
2. Surgical Exposure (Flap)	<p>Keep flap design conservative to minimize bony exposure</p> <ul style="list-style-type: none"> - *****Distal Buccal release behind the 2nd molar***** - Mesial releasing incision to the impacted tooth site <p>**IMPORTANT**</p> <ul style="list-style-type: none"> - When extending your flap distal of the 8, bring the incision buccal. The Ramus doesn't extend directly distal! If you go straight back, you will only be in soft tissue and will cut the lingual nerve in half 	
3. Bone Removal	<p>Makes room for the removal</p> <ul style="list-style-type: none"> - Keep the troughing minimal though <p>Keep lateral cortex intact and bone distal to 2nd molar intact</p> <p>DON'T cut the lingual cortex</p>	
4. Division or Crowns/Roots	<p>See below for more specifics</p>	
5. Elevation of Tooth Fragments	<p>Maybe necessary to create a purchase point on the root to help elevate it out</p>	

6. Debridement	Irrigate the socket and underneath the flap - Debride wound edges
7. Suture	

Sectioning Techniques for Impacted 3rd Molars	
Mesioangular Impaction	 <p>Remove some buccal bone -> Create a purchase point in the crown – Elevate out OR</p> <p>Section the D half of the crown -> Give you space to distally roll the tooth out of the socket</p> <p>OR</p> <p>Section the Crown and root in half and elevate the 2 pieces out of the socket</p> 
Horizontal Impaction	
Vertical Impaction	 <p>Section the distal half to allow space for rolling out the crown and roots OR</p> <p>Section the Crown and Root in half OR</p> <p>Remove the crown and pick the roots out individually</p>
Distoangular Impaction	 <p>Remove the D half of the crown and roll it out distally OR</p> <p>Section the crown and the roots. Remove in 2 or 3 pieces</p>

Post Operative Patient Management

It should really be prevention of problems, not management of them -> The best management is prevention ☺

Pre-Surgical Assessment

- This is super important. Anticipate issues before they happen to prevent them from occurring or being prepared to handle it
- Review Med Hx.
- Clinical and Radiological assessment
- Communicate Post Op Care/Management

Medical Conditions to look out for	<ul style="list-style-type: none"> - Bleeding disorder - Liver Disorder - Diabetes (Type 1 or 2) - Osteoporosis -> Are they taking Bisphosphonates? (Oral, IV, IM) - Cancer -> are they taking Bisphosphonates? (IV) - Immunocompromised? -> Cancer, Leukemia, Organ transplant - Radiation Patient? - Autoimmune Disorders - Elderly
Bleeding	Home Care instructions listed below

	<ul style="list-style-type: none"> - Tannic acid in black tea bags cause vasoconstriction to ↓ bleeding - Avoid smoking for 12+ hours - No strenuous exercise for 24 hours. ↑ blood pressure may ↑ bleeding <p>Challenges</p> <ul style="list-style-type: none"> - Oral tissues are highly vascular and will bleed lots - May be difficult to apply direct pressure to a wound - Negative pressures created by the tongue may dislodge the clot - Salivary enzymes may lyse the clot early <p>Medications that ↑ Bleeding:</p> <ul style="list-style-type: none"> - Aspirin, Plavix -> Anti-platelet meds - Coumadin (Warfarin), Pradaxa (Dabigatran), Xarelto (Rivaroxaban), Elquis (Apixaban) -> Anticoagulants - Antibiotics may ↓ Vit. K - Alcohol -> ↓ liver function - Chemotherapeutic agents <p>Hemorrhage control</p> <ul style="list-style-type: none"> - Gelfoam (Absorbable gelatin sponge) <ul style="list-style-type: none"> - Forms scaffold for clot formation - Surgical (Oxidized regenerated cellulose) <ul style="list-style-type: none"> - Promotes coagulation - Topical Thrombin <ul style="list-style-type: none"> - Converts fibrinogen to fibrin (bypasses most of the clotting cascade) - Avitene (Collagen) <ul style="list-style-type: none"> - Promotes platelet aggregation - Available as collagen plug or tape 												
	Liver Clots -> Poorly formed clots, should be removed and the surgical site re-assessed												
Pain	<p>Manage patients' expectations -> The pain won't be completely removed!</p> <ul style="list-style-type: none"> - ↑ anxious patients will experience ↑ pain <p>Make sure to give pain meds and anti-inflammatories before the LA has worn off</p> <ul style="list-style-type: none"> - Mild Pain: NSAIDs, Acetaminophen <ul style="list-style-type: none"> - Ibuprofen 400-800mg q4-6h prn pain -> Max: 3200mg/day - Acetaminophen 500-1000mg q4-6h prn pain -> Max: 4000mg/day <ul style="list-style-type: none"> - Can stagger these two. Take NSAID, 2hrs later take Aceto. 2hrs after than you can take more NSAID, 2hrs after this can take more Aceto etc etc - Moderate Pain: Toradol, Tylenol #2, 3, 4 <ul style="list-style-type: none"> - Codeine 15-60mg q4-6h prn pain - Hydrocodone 5-10mg q4-6h prn pain - Toradol 10mg q6h prn pain - *Can add Acetaminophen to these as long as it is at least 500mg* - Severe Pain: Oxycodone, Percocet <ul style="list-style-type: none"> - Oxycodone 2.5-10mg q4-6h prn pain <table border="1"> <thead> <tr> <th>Medication</th><th>Components</th></tr> </thead> <tbody> <tr> <td>Tylenol #2</td><td>15mg Codeine/300mg acetaminophen</td></tr> <tr> <td>Tylenol #3</td><td>30mg Codeine/300mg Acetaminophen</td></tr> <tr> <td>Tylenol #4</td><td>60mg Codeine/300mg Acetaminophen</td></tr> <tr style="background-color: black; color: white;"> <td>Percodan</td><td>5mg Oxycodone/325mg Aspirin</td></tr> <tr> <td>Percocet</td><td>2.5mg Oxycodone/325mg Acetaminophen 5mg Oxycodone/325mg Acetaminophen 7.5mg Oxycodone/500mg Acetaminophen 10mg Oxycodone/650mg Acetaminophen</td></tr> </tbody> </table>	Medication	Components	Tylenol #2	15mg Codeine/300mg acetaminophen	Tylenol #3	30mg Codeine/300mg Acetaminophen	Tylenol #4	60mg Codeine/300mg Acetaminophen	Percodan	5mg Oxycodone/325mg Aspirin	Percocet	2.5mg Oxycodone/325mg Acetaminophen 5mg Oxycodone/325mg Acetaminophen 7.5mg Oxycodone/500mg Acetaminophen 10mg Oxycodone/650mg Acetaminophen
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Swelling	Max swelling in 36-48 hours -> begins to subside on day 3-4 -> Should resolve after 1 week												
Ecchymosis	= Bleeding into subcutaneous or submucosal spaces <ul style="list-style-type: none"> - Appears 2-4 days after surgery - If severe may extend into submandibular -> neck and upper anterior chest - Should resolve in 1-2 weeks <p>↑ in elderly -> ↓ tissue tone, ↑ capillary fragility, weaker intercellular attachments</p>												
Diet	High calorie, high volume (liquids or soft foods) -> give body the energy needed for recovery <ul style="list-style-type: none"> - Keep it liquid for 24hrs (Consume 2L in first 24 hours) <p>Diabetic patients should try to return to normal insulin and diet ASAP</p>												
Trismus	<p>Problems arise with Maximal opening of 10-20mm</p> <p>Can have several causes:</p> <ul style="list-style-type: none"> - Trauma from tooth extraction - Extensive flap size -> ↑ inflammation - IAN Nerve block -> Trauma and inflammation to the Medial Pterygoid muscle - Hematoma in muscle of mastication (mostly Medial Pterygoid) -> Resolves in 2-3 weeks - Infection 												

Post- Surgery Home Care Instructions

Please read and follow these important post operative instructions for a complication free recovery. If you have any concerns please feel free to contact.

Bleeding

Minor bleeding/oozing may continue for **1-2 days**. It is normal to see some blood on your pillow in the morning.

- Place a moistened gauze pack over the surgical area and bite down for **30 minutes** (Do not leave in while sleeping)
 - o Repeat every hour until bleeding slows down
- Avoid spitting or talking too much for the **1st day**
- Avoid **sucking actions (Straws, Smoking etc)** for **5 days**
- Avoid strenuous exercise for **1st 24hrs**.

If you notice excessive **bright red bleeding** -> Place a **Moist Black Tea bag** over the surgical and bite down for 30 minutes.

- Call surgeon or dentist and inform them of your issue
-

Pain

Pain usually begins to **subside after 24-48 hours** (discomfort may still persist)

- **Minor Pain:** Over-the-counter medication (**Advil, Ibuprofen, Tylenol**)
 - o Ibuprofen/Advil: 400-800mg every 4-6 hours (do not exceed 3200mg/day)
 - o Acetaminophen/Tylenol: 500-1000mg every 4-6 hours (do not exceed 4000mg/day)
 - Advil -> 2hrs later take Tylenol -> 2hrs after than you can take more Advil -> 2hrs after this can take more Tylenol -> Repeat as needed
- **Major Pain:** Use prescribed medication as directed

The best way to control pain is to limit it before it becomes severe.

Swelling/Bruising

Swelling is common for **1-7 days**. If Bruising occurs it should **resolve** in **7-10 days**.

- Place ice pack wrapped in a cloth on swollen area **20 minutes on, 20 minutes off** as needed for the **1st 24 hours**
 - After 24 hours use moist warm heat for comfort
 - Sleep with your head elevated with 2 pillows
-

Diet

After the freezing wears off and the bleeding slows, start with cool clear liquids

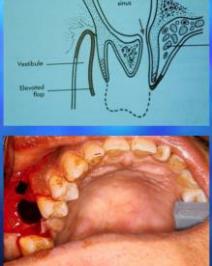
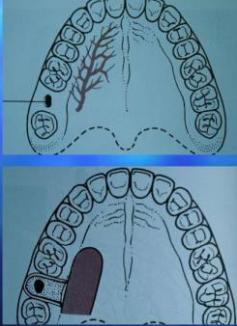
- Avoid hot liquids and foods for 24 hours
 - Gradually increase diet to soft foods and shakes
 - If feeling nauseated, try a carbonated beverage. If this does not improve take over-the-counter Gravol
-

Other

- Maintain good oral hygiene, but avoid the surgical area
- Gently rinse your mouth with warm salt water after each meal
- Stitches will dissolve gradually over 1-2 weeks
- If hives or an itch develops on your skin, stop the prescribed medication and contact the surgeon
- Do not operate a motor vehicle or operate machinery for 24 hours after anesthesia

If your recover is not improving after 5 days please call for a follow-up appointment

Complications

Alveolar Osteitis (Dry Socket)	<p>NOT an infection</p> <ul style="list-style-type: none"> - Lysis of the blood clot -> Exposure of bone -> Pain and delayed healing - High level of fibrinolytic activity <p>Clinically:</p> <ul style="list-style-type: none"> - Pain develops on 3rd or 4th day post extraction - Extraction socket appears empty (Partial or complete loss of clot), Exposed bone - Throbbing pain radiating to the ear - Bad odor and taste (from dead blood, not infection) - Painkillers are ineffective and ↑ pain with irrigation <p>Occurs in <2% of all extractions</p> <ul style="list-style-type: none"> - ↑ incidence in smoking - ↑ incidence in women on oral contraceptives - Extensive opening of surgical site - ↑ in Mand/ vs Max sites <p>How to avoid:</p> <ul style="list-style-type: none"> - Clean surgery - Quick surgery - Suture as soon as possible and close tightish to hold the clot in (Figure 8, or at least 2 single interrupted) <p>Tx:</p> <ul style="list-style-type: none"> - Irrigation with monojet syringe - Place medicated dressing: Alveogel (Eugenol + Benzocaine + Balsam of Peru) <ul style="list-style-type: none"> - Eugenol kills nerve endings; Benzocaine numbs the site, Balsam of Peru is the carrier -> Don't pack it too much! Causes osteomyelitis - Do not curette or you will just destroy the clot that is still hanging in there
Oroantral Communication	<p>Examine the surgical site If persistent communication for >2 week = Surgery</p> <ul style="list-style-type: none"> - Caldwell-Luc procedure - Nasal Antrostomy - Buccal Flap Advancement (shown below) <div style="display: flex; justify-content: space-around;">   </div> <ul style="list-style-type: none"> - Palatal Flap Advancement <div style="display: flex; justify-content: space-around;">  <p>Provides the Greater Palatine arterial blood supply to healing site</p> </div> <ul style="list-style-type: none"> - Metallic foil technique <p>Sinus Precautions</p> <ul style="list-style-type: none"> - Antibiotics - Nasal decongestant spray - Antihistamines - Avoid nose-blowning - Avoid sneezing - Avoid sucking a straw - Avoid smoking

Infection	<p>Cardinal Signs of Infection (need 3/5 before we really start considering it)</p> <ul style="list-style-type: none"> - Dolor (Pain, worsening after 3-4 days) - Tumor (Swelling, ↑ after 3-4 days) - Calor (Warmth) - Rubor (Erythema/redness) - Functio laesa (↓ function, Trismus) <p>Indications for Antibiotics</p> <ul style="list-style-type: none"> - Rapidly progressive swelling - Diffuse swelling - ↓ Immune defenses - Involvement of facial spaces (Submandibular, Submental etc) - Severe pericoronitis - Osteomyelitis <p>Use the narrowest-spectrum drug you can</p> <ul style="list-style-type: none"> - Dose: 4-5x Minimum inhibitory concentration - Time: 4x the plasma ½ life - Duration: 3-5 days to resolve symptoms + 2-3 days to make sure = 5-7 days <p>*Pt comes in w/ infection already -> Give 1g loading dose Amoxicillin right away and Rx 500mg for 7 days.</p>
Allergic Reactions	<p>Presentation:</p> <ul style="list-style-type: none"> - Itching - Hives - Redness - Edema (Lips and eyes) - Breathing issues <p>Management:</p> <ul style="list-style-type: none"> - Benadryl 50mg orally -> Most cases - Epinephrine IM or Subcutaneous (0.3mL of 1:1000) -> Anaphylaxis - Monitor vitals - Send to hospital/911 if severe <p>I = Allergic Anaphylaxis and Atopy II = antiBody III = immune Complex IV = Delayed</p>
Delayed Healing	Many causes: <ul style="list-style-type: none"> - Retained Root/crown <ul style="list-style-type: none"> - Take X-Ray, Explore and debride + Irrigate fragment out, Primary closure, Ab + saline rinse - Necrotic bone - Foreign body (Drill, file, gutta percha, gauze etc) - Glue - ONJ <ul style="list-style-type: none"> - Bisphosphonates!
Air Emphysema	<p>Associated w/:</p> <ul style="list-style-type: none"> - Handpiece air exhaust into surgical site and flap - Mandibular fractures - Lefort I, II, III fractures - Tracheal, Laryngeal, bronchial injuries <p>Presentation:</p> <ul style="list-style-type: none"> - Sudden soft tissue swelling - Crepitus on palpation - Lack of tenderness - Erythema - Airway compromise (Dysphagia, dysphonia, dyspnea) <p>Treatment</p> <ul style="list-style-type: none"> - Closure of intraoral wound - Reduction of facial fractures - Antibiotic Prophylaxis - Clear Airway obstruction - Avoid coughing, sneezing, nose blowing - Resolves in 2-4 days



-> Ludwig's Angina
(Hospital right away)

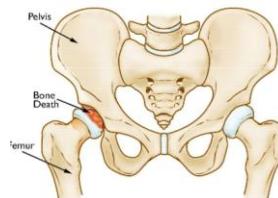
Osteoradionecrosis

Definition = Exposed and Necrotic bone associated w/ ulcerated or necrotic surrounding soft tissue, persists for 3+ months in an area previously irradiated, not caused by tumour recurrence

- Occurs also in Hip (> in men vs women)

Smokers = 2.8x longer healing time and likely to get Dry Socket

- WBC cannot reach the site to combat the inflammation
- Put PRF in socket to prevent dry socket



Types of Radiation therapy

External Beam	
3D Conformal Radiation Therapy	<ul style="list-style-type: none"> - Delivers beams from many directions to conform to the shape of the tumor - Can deliver high dose of radiation to the tumor while sparing the surrounding tissues
Intensity-Modulated Radiation Therapy (IMRT)	<ul style="list-style-type: none"> - Many beams, smaller than 3D conformal - Strength of some beams in some areas can be changed for ↑ or ↓ dose depending on the area
Image-Guided Radiation Therapy (IGRT)	<ul style="list-style-type: none"> - Uses imaging scans for Tx planning before rads and during rads
Tomotherapy (very new)	<ul style="list-style-type: none"> - Images of tumour taken before Tx -> allows for precise targeting - Rotates around during Tx -> Rads given in spiral pattern
Stereotactic Radiosurgery	<ul style="list-style-type: none"> - Focused, high energy beams (for small tumors with well defined edges) - Used for brain and CNS tumors where surgery is risky
Stereotactic Body Radiation Therapy	<ul style="list-style-type: none"> - Small isolated tumors outside brain and CNS -> Often in liver and lung

****Important Note:** Different forms of radiation don't produce the same biological effects. It depends on:

1. Radiation Type (Atomical origin, level of energy)
2. Tissue Type
3. Radiation Schedule (Fractionation, dose per fraction, total cumulative dose)

External Beam = more +ve correlation w/ ORN incidence vs internal implant radiation (Brachytherapy)

Oral Effects of Radiation	<p>Typical Tx fields: Salivary glands, Oral cavity, Jaws</p> <p>Short Term:</p> <ul style="list-style-type: none"> - Oral Erythema + Ulceration - Candidiasis - Dysgeusia - Parotitis <p>Long Term:</p> <ul style="list-style-type: none"> - Hyposalivation - Erythema + Ulcers - Dental Caries - ↓ Taste - Hyposalivation - Acute Sialadenitis - ↓ Taste - Epithelial Atrophy + Fibrosis = Trismus - Osteoradionecrosis
Pre-Radiation Prep	<p>Consult with radiotherapist to know the field of radiation + Max Dose</p> <ul style="list-style-type: none"> - Perio teeth / PA abscess = Extraction 2 weeks before rads - Ab prophylaxis before and 1 week after (4x/day) <p>Prepare custom fluoride trays, Rx 0.4% stannous fluoride gel for 3-5mins/day</p> <p>Begin 2-3 month recall schedule -> Check carefully for OHE and root caries</p> <ul style="list-style-type: none"> - Xerostomia creates circumferential cervical caries

Osteoradionecrosis

Osteoradionecrosis				
Incidence	2.6% - 22% <ul style="list-style-type: none"> - ↑ incidence in the mandible vs maxilla - Mand. is primarily cortical bone with ↓ vascularity - Can occur from a few months – 30 years after rads! But >70% of cases develop in first 3 years 			
Predisposition/Risk Factors	<p>High radiation dose in particular area (>6500 cGy)</p> <ul style="list-style-type: none"> - Odontogenic infection, Trauma -> These things should be handled before radiation if possible - Site: Mandible has ↓ vascular flow = ↑ ORN <ul style="list-style-type: none"> - Blood supply to mandible is from periosteum, NOT Inferior Alveolar Artery 			
<table border="1"> <tr> <td>Patient Related Factors</td> <td>Neoplasm Related Factors</td> <td>Treatment Related Factors</td> </tr> </table>		Patient Related Factors	Neoplasm Related Factors	Treatment Related Factors
Patient Related Factors	Neoplasm Related Factors	Treatment Related Factors		

	<ul style="list-style-type: none"> - Active dental disease - ↓ OHE - ↓ Pre-radiation oral care - Alcohol + Tobacco 	<ul style="list-style-type: none"> - Anatomic location of tumor (Max vs Mand.) - Clinical state of tumor - Presence of lymph node metastasis 	<ul style="list-style-type: none"> - Field of radiation - Total Rads dose - Dose rate/day - Mode of radiation delivery - Tumour surgery 															
Medication Related																		
<ul style="list-style-type: none"> - Antiosteoclastic agents (Bisphosphonates, Denosumab) - Antiangionenic agents (Bevacizumab, Sunitinib) 																		
Trauma																		
<ul style="list-style-type: none"> - Lingual plate of molars in particular 																		
Odontogenic Infection																		
<ul style="list-style-type: none"> - Osteomyelitis leading to sequestrum formation 																		
Primary Sclerotic Bone disease (Semento-osseous dysplasia)																		
Viral Infection (Oral shingles)																		
Clinical Features	<u>Hx of radiation + 1+ of the following w/ 3 months:</u> <ul style="list-style-type: none"> - Nonhealing ulcer - Exposed bone - Pain/Dysaesthesia/anaesthesia - Orocutaneous fistula - Pathological Fracture 																	
	<u>Radiographic findings</u> <ul style="list-style-type: none"> - ↑ bone density - Periosteal thickening - Diffuse RL - Sclerosis - Sequestration - Mottled areas of osteoporosis 																	
Cause/ Pathophysiology	<u>Traditional Theory</u> Ultimately -> Breakdown of hypocellular , hypovascular and hypoxic tissues in nonhealing wound containing sequestra <ul style="list-style-type: none"> - "Theory of 3 H's" -> Robert Marx = Irradiated bone has ↓ cellular viability, Obliteration of vessels and compromised bone turnover <u>Current understanding</u> = the Radiation-Induced Fibroatrophic Process																	
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Diagnosis	Radiotherapy over a critical dose (>5000 cGy) Necrotic soft tissue/bone >3 months Radiographic change Absence of malignancy (confirmed w/ histopathology)																	
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Tx:	<u>Varies:</u> <ul style="list-style-type: none"> - Antibiotics - Surgical Debridement -> keep it conservative (don't disturb the periosteum, preserve the blood supply) - HBO Therapy -> Controversial, studies have shown no effect...but it does produce the best TV shows - Medical alternatives (little evidence currently): Pentoxifyline, Tocopherol and Clodronate <p>Supplemental Management:</p> <ul style="list-style-type: none"> - Strict Oral Hygiene - ↓ smoking - Judicious Ab use -> Doxycycline (Tetracycline) can stimulate Collagen formation 😊 																	

Medication Regime	<p><u>Pentoxifylline</u>: 800mg/day for 6-24 months</p> <p><u>Tocopherol</u> (Vitamin E): 100 IU/day for 6-24 months</p> <p><u>Clondronate</u>: 1600mg/day for 6-24 months (5 days per week)</p>
--------------------------	--

Management of Sequestrate (Necrotic Bone)

- Tell Pt to rub salt on it after meals (helps prevent infection and ↑ blood flow)
- Bring back in 3 weeks (this is how long it takes for changes to happen naturally) -> Painless removal
- Bone usually just falls off

Hyperbaric Oxygen Therapy (HBOT)

= Tx w/ 100% O₂ (Hyperoxia) at higher than atmospheric pressure



Effects of HBOT	<p>Partial pressure of O₂ ↑ from 200mmHg (1atm) to >2,000mmHg (3atm) = ↑ ↑ in tissue O₂ partial pressure</p> <p>Produces ROS and reactive nitrogen species -> Function as signaling molecules in wound healing pathways</p> <ul style="list-style-type: none"> - ↑ leukocyte function - Amelioration (improvement) of ischemia-reperfusion injury - Neovascularisation (formation of new vessel) from ↑ local growth factor and release of progenitor stem cells <p>Regime:</p> <ul style="list-style-type: none"> - Ideally 20 sessions before extraction and 10 sessions after
Side Effects	<ul style="list-style-type: none"> - Fatigue and Light-headedness - Lung Damage - Fluid buildup or bursting of middle ears (Important to equalize) -> Middle Ear Barotrauma - Vision change - O₂ poisoning (causing lung failure, fluid in lungs, seizures) - Sinus/paranasal barotrauma - Dental barotrauma (tooth squeeze) <p>*Despite how bad these sound they are typically mild and self limiting*</p> <p>*Keep it <2hrs, and <3atm*</p>

Medication Related Osteonecrosis of the Jaw (MRONJ)

Formerly known as BRONJ

Definition	<p>= Osteonecrosis of the jaw associated w/ osteoporosis or cancer drugs</p> <ul style="list-style-type: none"> - Bisphosphonates and Antiresorptive medications <p>Risk of Spontaneous MRONJ is only 0.01-0.04%</p> <ul style="list-style-type: none"> - This ↑ w/ surgical procedures <p>IV Bisphosphonates ↑ risk: 0.8-12%</p>
Risk Factors	<p>Use of Bisphosphonates or antiresorptive drugs</p> <ul style="list-style-type: none"> - Length of therapy and Dose are the major factors - IV Bisphosphonates ↑ risk vs oral <p>Dental Surgery + Bisphosphonates</p> <p>Periodontal Surgery + Bisphosphonates</p> <p>*Implants are mostly safe*</p>
Signs/Symptoms	<p>Exposed Necrotic Bone</p> <p>Non-healing extraction site</p> <p>Trismus</p> <p>Localised Pain</p> <p>Swollen Gums</p> <p>Loosened Teeth</p> <p>*Looks like periodontal disease, except for the exposed necrotic bone*</p>

Diagnosis	Must have 3 specific criteria: <ol style="list-style-type: none"> 1. Current or Previous Tx w/ antiresorptive or antiangiogenic agents 2. Exposed bone, or bone that can be probed through intra/extraoral fistula for >8weeks 3. No Hx of radiation therapy to the jaws
Meds that cause it	<p>Bisphosphonates:</p> <ul style="list-style-type: none"> - Fosamax - Actonel - Boniva - Zometa <p>Antibody Agonist Meds:</p> <ul style="list-style-type: none"> - Denosumab (Prolia) -> RANKL Inhibitor <p>Antiangiogenic Meds</p>
When Pt starts Bisphosphonates	<ol style="list-style-type: none"> 1. Perform dental exam + Pan Radiograph 2. Restore dentition 3. Ensure proper fit of removable prosthesis 4. Remove abscessed and non-restorable teeth + Teeth w/ severe periodontal disease w/ poor prognosis <p>*If systemic condition permit: Delay bisphosphonates for 21 days post-extraction*</p>
Treatment	<p>Prevention is key! But if shit hits the fan...</p> <p>Tx plan ranges from monitor -> pharmacologic intervention -> Major debridement -> Resection if its severe</p>

Staging and Tx Strategies

Table 1 Staging and Treatment Strategies

MRONJ† Staging	Treatment Strategies‡
At risk category No apparent necrotic bone in patients who have been treated with either oral or IV bisphosphonates	<ul style="list-style-type: none"> • No treatment indicated • Patient education
Stage 0 No clinical evidence of necrotic bone, but non-specific clinical findings, radiographic changes and symptoms	<ul style="list-style-type: none"> • Systemic management, including the use of pain medication and antibiotics
Stage 1 Exposed and necrotic bone, or fistulae that probes to bone, in patients who are asymptomatic and have no evidence of infection	<ul style="list-style-type: none"> • Antibacterial mouth rinse • Clinical follow-up on a quarterly basis • Patient education and review of indications for continued bisphosphonate therapy
Stage 2 Exposed and necrotic bone, or fistulae that probes to bone, associated with infection as evidenced by pain and erythema in the region of the exposed bone with or without purulent drainage	<ul style="list-style-type: none"> • Symptomatic treatment with oral antibiotics • Oral antibacterial mouth rinse • Pain control • Debridement to relieve soft tissue irritation and infection control
Stage 3 Exposed and necrotic bone or a fistula that probes to bone in patients with pain, infection, and one or more of the following: exposed and necrotic bone extending beyond the region of alveolar bone,(i.e., inferior border and ramus in the mandible, maxillary sinus and zygoma in the maxilla) resulting in pathologic fracture, extra-oral fistula, oral antral/oral nasal communication, or osteolysis extending to the inferior border of the mandible or sinus floor	<ul style="list-style-type: none"> • Antibacterial mouth rinse • Antibiotic therapy and pain control • Surgical debridement/resection for longer term palliation of infection and pain

† Exposed or probable bone in the maxillofacial region without resolution for greater than 8 weeks in patients treated with an antiresorptive and/or an antiangiogenic agent who have not received radiation therapy to the jaws.

‡ Regardless of the disease stage, mobile segments of bony sequestrum should be removed without exposing uninvolved bone. The extraction of symptomatic teeth within exposed, necrotic bone should be considered since it is unlikely that the extraction will exacerbate the established necrotic process.

**This is the paper used as a gold standard reference in Clinic...be familiar with it or get roasted in clinic

https://www.aaoms.org/docs/govt_affairs/advocacy_white_papers/mronj_position_paper.pdf

Bisphosphonates

****Zoledronic Acid**** -> Very common IV Bisphosphonate used to Tx Osteoporosis, High blood calcium from cancer, Bone breakdown from cancer, Paget's Disease

Mechanism of Action	Attached to bone tissue -> attach to and enter osteoclasts where they disrupt intracellular enzymatic functions needed for bone resorption
---------------------	--

Classifications

Gen.	MOA	Drug	Potency	Admin	Indication
1 st	Formation of ATP derivative that impairs osteoclast function + Induces osteoclast apoptosis	<u>Etidronate</u>	1	Oral	Osteoporosis Paget's Disease
		<u>Clodronate</u>	10	Oral IV	Osteoporosis Paget's Disease
		<u>Tiludronate</u>	10	Oral	Paget's Disease
2 nd	Inhibits sterol synthesis by inhibiting Farnesyl pyrophosphate synthase (FPPS) enzyme	<u>Pamidronate</u>	100	IV	Osteolytic bone metastases of Breast Cancer, Multiple Myeloma Paget's Disease
		<u>Alendronate</u>	500	Oral	Osteoporosis Paget's Disease
		<u>Ibandronate</u>	1000	Oral IV	Osteoporosis
3 rd	Inhibits FPPS enzyme and stabilises conformation changes	<u>Risedronate</u>	2000	Oral IV	Osteoporosis Paget's Disease Osteolytic lesions of Multiple myeloma Hypercalcemia of Malignancy
		<u>Zoledronate</u>	10000	IV	Osteolytic lesions of multiple myeloma and solid tumors Hypercalcemia of malignancy

Prevention and Management of Complications

Soft Tissue Injuries

Tearing Mucosal Flap	<u>Prevention:</u> <ul style="list-style-type: none"> - Adequate flap design and size to ↓ tension - Releasing incisions - ↓ retraction force <u>Tx:</u> <ul style="list-style-type: none"> - Reposition and suture (if tear is really bad you might have to cut away the rough edges first) 	
Trauma to adjacent soft tissue	<u>Prevention</u> <ul style="list-style-type: none"> - Control and support instruments - Control bleeding (↓ slippery) <u>Tx:</u> <ul style="list-style-type: none"> - Prevent injection (salt water rinse likely) - Heal via secondary intention 	
Abrasions/Burns	Typically in lips, corners of the mouth etc <ul style="list-style-type: none"> - Rotating shank/bur, metal retractors, elevators, electric cautery <ul style="list-style-type: none"> - Train your assistant to keep an eye on this for you while you are focused on the surgery <u>Prevention</u> <ul style="list-style-type: none"> - Adequate retraction <u>Tx:</u> <ul style="list-style-type: none"> - Mucosa will heal in 4-7 days -> Skin in 10-15 days (maybe leave a scar) - Antibiotic ointment 	
Puncture Wounds/Cuts	Slippage of instruments into tissue (elevators, root tip picks, periosteal, scalpels) <u>Prevention</u> <ul style="list-style-type: none"> - Proper finger rest and support <u>Tx:</u> <ul style="list-style-type: none"> - Cleanse the wound and allow for 2^o healing 	

Osseous Structure Injuries

Sites to watch out for:

Maxilla	Mandible
Buccal and Labial Cortical Plates - Max. Canines - Max Molars Maxillary Sinus Floor Maxillary Tuberosity	Buccal and Labial cortical plates - Mand. Incisors Mand. lingual cortical bone

Prevention Proper clinical and radiographic assessment of alveolar process Assess bone thickness Assess anatomical structures Age of the patient Avoid excessive force -> Finesse is your friend! Expand the surrounding alveolar bone slowly Enlist Open surgical techniques when you need to: - Soft tissue flap - Bone removal (keep it minimal though) - Section the roots	
Management <u>Max. Tuberosity Fracture:</u> - Dissect the bone from the tooth if the bone is completely removed - Smooth edges and reposition soft tissue <u>If severely mobile</u> (but periosteum is still intact) - 6 week splint -> Section the crown, allow the root and tuberosity to heal -> After 6-8 weeks = open surgical removal	

Oroantral Communications

Prevention Adequate preop. Radiographs - Pneumatized sinuses? - Minimal bone between roots and sinus? - Divergent roots?	
Dx Examine root tips for attached bone + Extraction site Nose blowing test -> Kinda risky though, you risk making a small communication bigger Airflow into the mouth Fluid flow into the nose <u>DON'T probe into the communication</u>	
Management <u>Small (<2mm)</u> - No Tx, just sinus precautions <u>Moderate (2-6mm)</u> - Figure 8 suture + Surgicel - Sinus precautions <u>Large (>7mm)</u> - Surgical flap closure -> Buccal advancement flap - Sinus Precautions	Sinus Precautions - Antibiotics (Amoxicillin 500mg) - Nasal Decongestant spray (Pseudoephedrine) - Antihistamine (Benadryl 50mg) - Avoid nose blowing - Avoid sneezing (sneeze with open mouth if you must – but close your eyes or they will explode) - No straw sucking (or use a high volume bubble tea straw if you must) - No smoking
Surgical Tx <u>If communication persists for > 2 weeks</u> - Caldwell-Luc procedure - Nasal Antrostomy - Buccal or Palatal flap advancement - Metallic (gold) foil technique -> Place gold foil over communication for 3 months (old method)	

What is the difference between a Fistula and a Communication?

- Fistula is epithelial lined (kinda like a healed communication but is still a hole)
- Communications are not epithelial lined! (Fresh holes)

Injuries to Adjacent Teeth/ Wrong Teeth Extracted

- BE CAREFUL. Too much force in the wrong direction can luxate the wrong tooth or damage restorations
- Also count carefully...people extract the wrong tooth more than you know or would like to admit
 - Especially common in the mixed dentition stage -> if you fuck up, replace the tooth quickly and observe for 4-5 weeks and call ortho immediately with your tail between your legs

Aspiration

Prevention	<ul style="list-style-type: none"> - 4x4 Gauze throat pack - C-Sponge
Management	<ol style="list-style-type: none"> 1. Turn patient towards the floor 2. Maintain the airway and use supplemental O₂ 3. Encourage Pt to cough and spit <ul style="list-style-type: none"> - If there is no coughing: Tooth has likely been swallowed and will be pooped out in 2-4 days - If violent coughing: Tooth may have been aspirated through vocal cords into trachea and bronchus 4. Send to ER for chest and abdominal radiographs w/ possible need for bronchoscopy procedure

Mandible Fracture

- Pretty rare complication -> Most often associated with impacted 3rd molars
- Occurs when you use excessive force in severely atrophic mandibles

Tx: Reduction and Stabilization

Nerve Injury

Incidence	<p><i>Local Anaesthesia Related:</i></p> <ul style="list-style-type: none"> - 1/400,000 injection -> Quite rare - Results from epineural haematoma or direct injury from the needle <p>**Informed Consent Important! Always mention this possibility**</p> <ul style="list-style-type: none"> - Include Diagrams, Radiographs, Written Consent
Recovery	<p>Usually occurs on its own over 6-8 weeks</p> <ul style="list-style-type: none"> - Could be as long as 6-9 months for full recovery - Regular follow-up appointments <p>Better and faster recovery seen with younger patients (<25 years)</p>

Haemostasis

Challenges	<ul style="list-style-type: none"> - Oral tissue is highly vascular - Difficult to apply direct pressure to the wounds - Negative pressure created by tongue can dislodge the clot - Salivary enzymes may lyse the blood clot
Bleeding Hx	<p>Ask about bleeding Hx and tendencies</p> <ul style="list-style-type: none"> - Congenital bleeding disorders? <p>Medications associated with ↑ bleeding:</p> <ul style="list-style-type: none"> - Anti-platelet Meds <ul style="list-style-type: none"> - Aspirin - Anticoagulants <ul style="list-style-type: none"> - Warfarin (Coumadin) -> Vitamin K antagonist - Praxada (Dabigatran) -> Direct Thrombin Inhibitor - Xarelto (Rivaroxaban) -> Factor Xa inhibitor - Eliquis (Apixaban) - Lixiana (Edoxaban) - Antibiotics that ↓ Vit K absorption from gut -> Cephalosporins - Alcohol -> ↓ liver function <p>Liver Disease (Hepatitis, Cirrhosis)</p> <p>Hypertension (Systolic BP>180)</p> <pre> graph TD IP[Intrinsic pathway] --> FactorX[Factor X] EP[Extrinsic pathway] --> FactorX FactorX --> FXa["Factor Xa + factor Va"] FXa --> Prothrombin[Prothrombin] Dabigatran[Dabigatran] --> Thrombin[Thrombin] Thrombin --> Fibrinogen[Fibrinogen] Fibrinogen --> Fibrin[Fibrin] Platelets[Platelets] --> Clot[Clot] Rivaroxaban[Rivaroxaban Apixaban Edoxaban] --> FXa </pre>
Controlling Bleeding	<p>Gelfoam -> Absorbable Gelatin sponges</p> <ul style="list-style-type: none"> - Forms a scaffold for clot formation - Cannot be packed though 😞 <p>Surgicel -> Oxidised regenerated Cellulose</p> <ul style="list-style-type: none"> - Promotes coagulation - WAY better than Gelfoam, don't be a cheap ass...use it <p>Topical Thrombin -> Directly converts Fibrinogen to Fibrin</p> <ul style="list-style-type: none"> - Applied to a gauze and placed in wound <p>Avitene (Collagen)</p> <ul style="list-style-type: none"> - Promotes platelet aggregation - Available as a collagen plug or tape

Wound Dehiscence

Prevention	Appropriate soft tissue flap design Atraumatic handling of the soft tissue
Management	Reposition the flap - Suture w/o tension!

Alveolar Osteitis (Dry Socket)

Presentation	<p>NOT AN INFECTION</p> <ul style="list-style-type: none"> - Occurs in <2% of all extractions - ↑ incidence with smoking and in women taking oral contraceptives <p>Caused by high level of fibrinolytic activity and lysis of the blood clot</p> <ul style="list-style-type: none"> - Exposure of the bone <p>Pain develops on 3rd/4th day</p> <ul style="list-style-type: none"> - Extraction socket appears empty (or with partial loss of clot) and is source of the pain - Throbbing pain radiates to the ear - Bad odor and taste (very characteristic smell when you treat it enough) 	
Treatment	<p>Alveogel</p> <ul style="list-style-type: none"> - Eugenol (Kills the nerve endings) - Benzocaine (Topical anaesthetic) - Balsam of Peru (Carrier for the medicament) <p>-> Place alveogel in socket and change it for 1-2 days</p> <ul style="list-style-type: none"> - It will come out on its own through, so you don't necessarily need to change the dressing if the pain has stopped 	

Infections

Prevention	Fast Aseptic surgery Appropriate prophylactic antibiotics when indicated
Signs and Symptoms	Need 3/5 before we REALLY start considering infection <ul style="list-style-type: none"> - Pain (Dolor) - Swelling (Tumor) - Warmth (Calor) - Erythema (Rubor) - Loss of function (Trismus) (Functo Laesa)
Indications for Antibiotics	<ul style="list-style-type: none"> - Rapid progressive swellings - Diffuse swelling - Compromised Host Defenses - Involvement of Facial Space (More on that later) - Severe Pericoronitis causing trismus - Osteomyelitis
Send to the ER if:	<ul style="list-style-type: none"> - Difficulty Breathing - Difficulty Swallowing - Dehydration - Moderate to Severe Trismus (<25mm interincisal opening) - Swelling extended beyond alveolar process - Elevated Temps >38.3°C - Malaise and toxic appearance - Compromised host defenses - Need for GA - Failed prior treatment

Air Emphysema

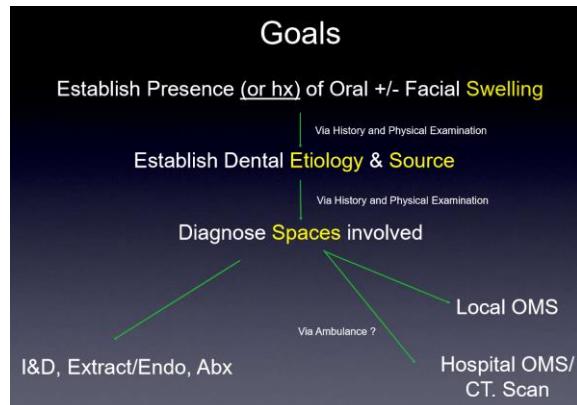
Presentation	Sudden onset of soft tissue swelling Crepitus on palpation Lack of tenderness Erythema Airway Compromise (Dysphagia, Dysphonias, Dyspnoea)
Tx	Closure of intraoral wound Reduction of the facial fractures Antibiotics Manage airway obstruction Avoid coughing, sneezing, nose blowing Resolves in 2-4 days

Odontogenic Infection

2 Major sources of the Infection:

Periapical	<u>Pulpal Necrosis</u> -> Bacteria Spreads into periapical tissues -> Spreads through cancellous bone and thins the cortical plate -> spreads into soft tissue <ul style="list-style-type: none"> - Level of infection depends on penetration above or below the muscle attachments - Vestibular Infection vs Facial space infection
Periodontal	<u>Deep periodontal pocket</u> -> Inoculation of bacteria into the soft tissue

Principles of Management
<ul style="list-style-type: none"> - Assess the Severity - Evaluate host defenses - Determine the setting for care <ul style="list-style-type: none"> - (GP office, OS office, Hospital?) - Surgical Tx - Support medically - Antibiotic therapy



Diagnostic Principles

1. Establish Etiology <ul style="list-style-type: none"> - Recent Extraction? - Dental pain? - Dental Tx? 	2. Establish the Source <p>Percussion test -> Imaging is deceiving</p> <p>Maxillary Infections:</p> <ul style="list-style-type: none"> - Typically spread through bone buccally <p>Mandibular Infections:</p> <ul style="list-style-type: none"> - Anterior teeth spread buccally - Posterior teeth spread through bone lingually 					
3. Hx and Physical Exams <p>Onset of swelling/pain Duration Rapidity</p> <p>Signs and Symptoms</p> <ul style="list-style-type: none"> - <u>Local</u>: Pain, Swelling, Warmth, Erythema, Loss of Function - <u>Systemic</u>: Leukocytosis (\uparrow WBC), Malaise, Lymphadenopathy, Fever <p>Past Medical Hx</p> <ul style="list-style-type: none"> - Compromised Host Defenses? <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> Uncontrolled Metabolic Disorders </td><td style="width: 50%; padding: 5px; vertical-align: top;"> End-Stage renal disease Alcoholism + Malnutrition Poorly controlled diabetes </td></tr> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> Suppressing Diseases </td><td style="width: 50%; padding: 5px; vertical-align: top;"> Leukemia Lymphoma Malignant tumor HIV </td></tr> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> Suppressing Drugs </td><td style="width: 50%; padding: 5px; vertical-align: top;"> Chemo drugs Immunosuppressants Organ Transplant drugs </td></tr> </table> <p>Physical Exam:</p> <ul style="list-style-type: none"> - High Temps? (38.3-38.9°C) - Tachycardia (HR up to 100bpm) - \uparrow RR (Up to 18 breathes/min) - Toxic Appearance -> Fatigues and Lethargic - Intraoral exam <p>Rads</p>	Uncontrolled Metabolic Disorders	End-Stage renal disease Alcoholism + Malnutrition Poorly controlled diabetes	Suppressing Diseases	Leukemia Lymphoma Malignant tumor HIV	Suppressing Drugs	Chemo drugs Immunosuppressants Organ Transplant drugs
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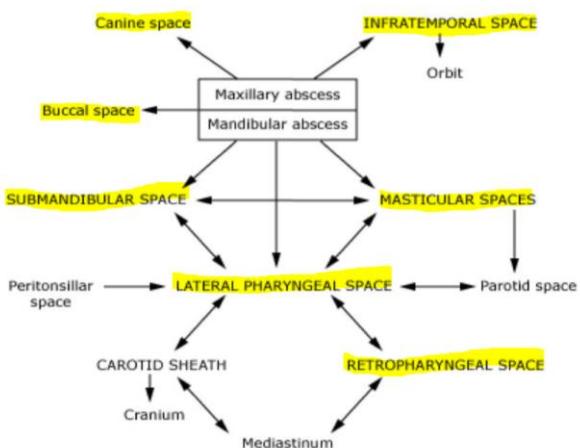
4 Stages of Infection

1. Inoculation	Duration: - 0-3 days Signs/Symptoms - Soft, Mildy tender, Doughy
2. Cellulitis	Duration - 3-5 days Signs/Symptoms - Very painful - Hard, Red, Acutely tender area - Large, Diffuse zone of swelling and redness
3. Abscess	Duration - 5-7 Days Signs/Symptoms - Less painful than cellulitis - Soft, Fluctuant, Tender - Purulent - Small, Circumscribed region
4. Resolution	Immune system is able to combat the infection - Healing and repair of tissue

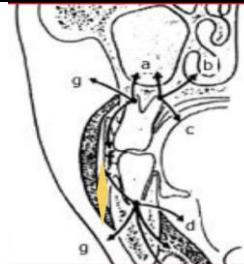
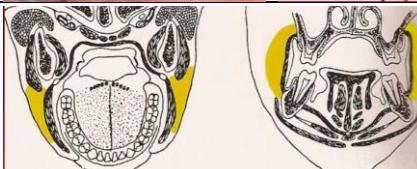
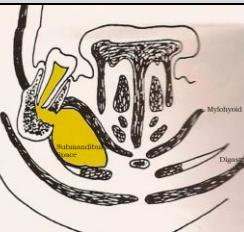
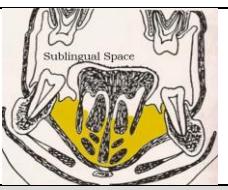
Cellulitis Vs Abscess		
	Cellulitis	Abscess
Duration	Acute	Chronic
Pain	Generalized and Severe	Localized
Size	Large	Small
Localization	Diffuse borders	Well circumscribed
Palpation	Doughy/Indurated/hard	Fluctuant
Pus?	Nope	Yup
Seriousness	Greater	Less
Bacterial Composition	Aerobic	Anaerobic

Facial Spaces

- Buccal
- Canine
- Masticator (Masseter, Pterygoid, Temporal)
- Submandibular, Sublingual, Submental
- Lateral Pharyngeal
- Pretracheal, Retropharyngeal -> Danger Space!



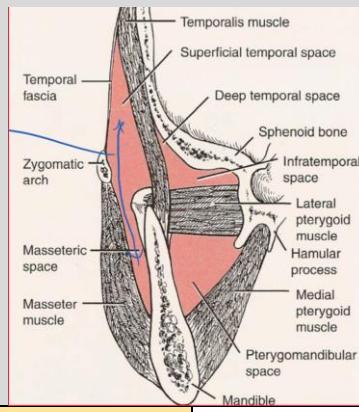
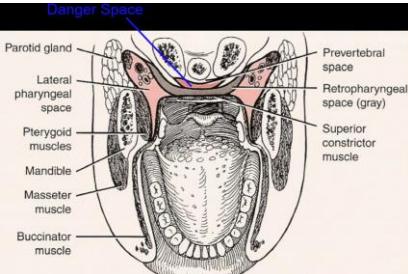
These are all arranged in different groups for ease

Groupings of Facial Spaces			
Vestibular/Canine Space	<p><u>Characteristics:</u></p> <ul style="list-style-type: none"> - Cheek Swelling - Vestibular Fullness (this is the differentiator vs Buccal space) - No ↓ in mouth opening <p><u>Location:</u></p> <ul style="list-style-type: none"> - Medial side of Buccinator m. insertion 	 	
Buccal Space	<p><u>Characteristics:</u></p> <ul style="list-style-type: none"> - Cheek Swelling - No vestibular fullness - ↓ mouth opening (but no Trismus) <p><u>Location:</u></p> <ul style="list-style-type: none"> - Lateral side of Buccinator m. Insertion 		
			-> Also showing signs of Toxicity here
	<p style="text-align: center;">BOTTOM LINE</p> <pre> *-----+ Cheek Swelling Vestibular Fullness No Vestibular fullness -----+-----+ ↓ Mouth opening >15-20mm -----+ Buccal Space IntraOral I&D IntraOral Vs ExtraOral I&D Tx: Extraction/Endo +/-Antibiotics </pre>		I&D = Incise and Drain*
Submandibular/Submental Space	<p><u>Characteristics:</u></p> <ul style="list-style-type: none"> - Dysphagia, Odynophagia, Difficulty controlling secretions - Unable to palpate border of mandible - Submandibular skin -> Warm, swollen, erythematous, tender <p><u>Location:</u></p> <ul style="list-style-type: none"> - Inferior to Mylohyoid m. attachment 	 	
Sublingual Space	<p><u>Characteristics:</u></p> <ul style="list-style-type: none"> - Dysphagia, Odynophagia, Difficults controlling secretions - FOM elevation or fullness - ↓ Tongue mobility <p><u>Locations:</u></p> <ul style="list-style-type: none"> - Superior to Mylohyoid m. insertion 		
	<p style="text-align: center;">BOTTOM LINE</p> <pre> Neck and Floor of mouth Swelling -----+ Submandibular skin & mandibular border Submandibular Space CT Scan -----+ OR Time !! Extraoral I&D Floor of the mouth -----+ Sublingual Space OR Time !! IntraOral or ExtraOral I&D Extraction +/-Antibiotics </pre>		OR = Operating Room

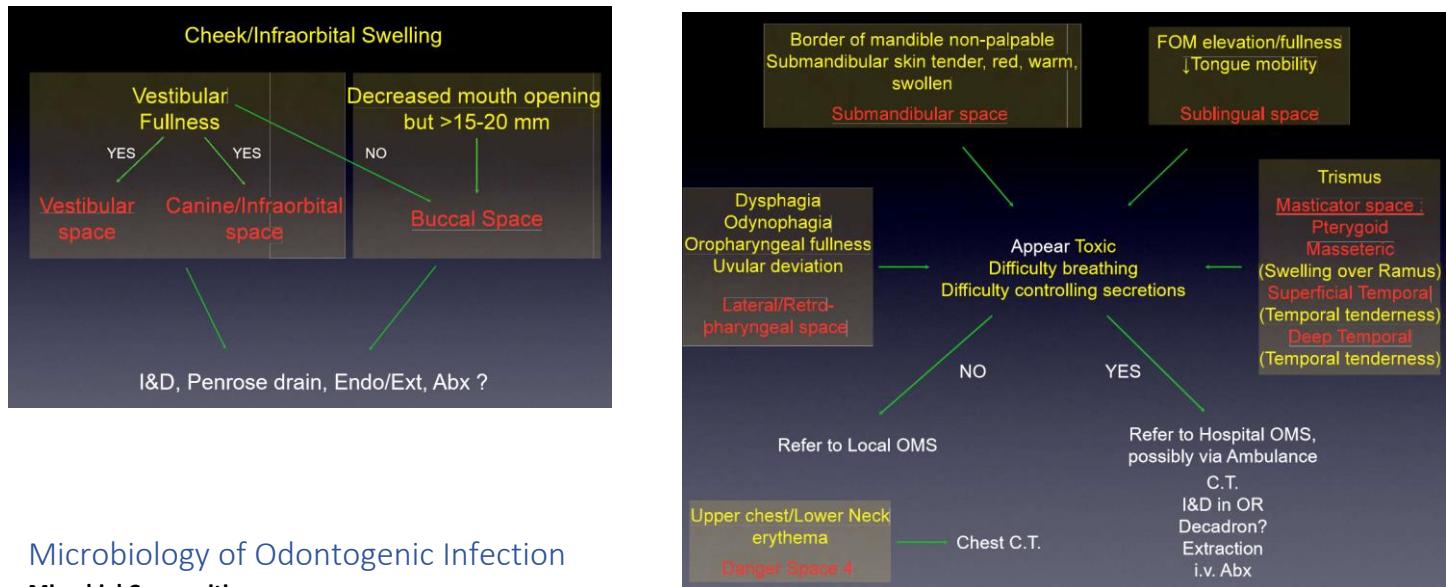
****Involvement of both spaces = Ludwigs Angina -> This is VERY serious as it could effect the airway. Tx in Hospital immediately****



Masticator Space

Temporal Spaces	<p>Characteristics:</p> <ul style="list-style-type: none"> - Trismus (<10-15mm interincisal opening) - Temporal Tenderness <p>Location:</p> <p>Superficial Temporal Space</p> <ul style="list-style-type: none"> - Superficial to Temporalis m. <p>Deep Temporal Space:</p> <ul style="list-style-type: none"> - Deep to Temporalis m.
Masseteric Space	<p>Characteristics</p> <ul style="list-style-type: none"> - Trismus (<10-15mm Interincisal Opening) - Preauricular/Ramus swelling and tenderness <p>Location:</p> <ul style="list-style-type: none"> - Lateral Ramus
	<p>BOTTOM LINE</p> <p>Trismus</p> <p>Masticator Space</p> <p>CT Scan</p> <p>OR Time !!</p> <p>Masseteric Space Sup/Deep Temporal Space Pterygoid Space</p> <p>Extraoral I&D Extraoral I&D IntraOral I&D</p> <p>Extraction +/-Antibiotics</p>
Lateral + Retro Pharyngeal Spaces	<p>Location:</p> <ul style="list-style-type: none"> - Posterior to Superior Constrictor, but Anterior to Alar layer of Prevertebral Fascia <p>Danger Space</p>  <p>Bedroom Eyes</p> <p>-> The look of the guy who is about to steal your girl</p>
	<p>BOTTOM LINE</p> <p>Dysphagia Odynophagia Difficulty swallowing or breathing</p> <p>Oropharyngeal fullness / Uvular Deviation</p> <p>Lateral +/- Retropharyngeal Space</p> <p>Referral to Local Vs Hospital OMS depends on .</p> <p>i.v. Steroids Pre-intubation Aspiration ?</p> <p>Time, Hospital privileges saves time OR Time !! Extraction +/-Antibiotics</p> <p>CT Scan</p> <p>IntraOral I&D Tracheotomy ? Extraoral I&D</p>

A Very Nice Summary:



Microbiology of Odontogenic Infection

Microbial Composition:

- Aerobic: 6%
- Anaerobic: 50%
- Mixed 44%

So What is happening?

1. *Initiated by Aerobic bacteria*
 - Gain access to tissue
 - Aerobic causes cellulitis
 - Creates Hypoxia + Acidosis = prime environment for anaerobes
2. *Followed by Anaerobes*
 - Tissue destruction -> Pus formation
 - Enzymes that destroy antibiotics

Principles of Therapy

1. Determine Severity	<p><u>Hx</u></p> <ul style="list-style-type: none"> - Onset - Duration - Rapidity - Loss of Function <p><u>Physical</u></p> <ul style="list-style-type: none"> - Vital Signs - Swelling assessment - Assess Airway!
2. Evaluate Host Defenses	Does patient have any systemic issues that ↓ their immunity? <ul style="list-style-type: none"> - Diabetes, Alcoholism, Steroid therapy, Chemotherapy, Malignancy, HIV, Malnutrition, Organ transplants
3. Determine if they should go to the ER	<ul style="list-style-type: none"> - Airway Compromise - Rapid progression - Secondary Facial space involvement (2+ spaces) - Fever - Medical Management of underlying condition - Severe Trismus (<10-15mm) - Toxic Appearance - Difficulty swallowing or speaking - Need for Operating room / GA
4. Tx w/ Surgery	<p>Provide Drainage</p> <ul style="list-style-type: none"> - Never let the sun set on pus! Also never let the sun go down on me - Get it alllllll out or it will recur - Keep the space open w/ drain after drainage -> Create aerobic environment to ↓ growth on anaerobes <div style="float: right;"> DON'T LET THE SUN GO DOWN ON ME ELTON JOHN </div>

	<p>Technique:</p> <ol style="list-style-type: none"> 1. Pick the site most affected (hardest and most full of pus) 2. Apply anesthesia (LA, IV sedation, GA) 3. Disinfect site with Betadine 4. Aspirate 2mL of pus for culture/sensitivity 5. Incision <1cm 6. Blunt dissection into the abscess cavity (w/ hemostat opening) to open up lobulations 7. Place $\frac{1}{4}$" sterile Penrose drain for 2-5 days <p>Optional:</p> <ul style="list-style-type: none"> - Gain patient consent for video release. Film it and become a Youtube star (AKA Dr. Pimple Popper) to a niche market <p>Remove the cause of the infection</p> <ul style="list-style-type: none"> - Endo Tx -> Vestibular/Buccal/Canine Spaces - Extraction -> All other spaces (cannot rely on endo) - Remove foreign bodies - Debride non-viable bone 				
5. Support Medically	Fluids Nutrition Analgesics Rest				
6. Choose and Rx Antibiotics	<p>1st deem if it is necessary</p> <ul style="list-style-type: none"> - Use empiric therapy + choose narrowest spectrum drug <p>Dose:</p> <ul style="list-style-type: none"> - 3-4x the Minimum Inhibitory Concentration <p>Time Interval:</p> <ul style="list-style-type: none"> - 4x the plasma half life <p>Duration:</p> <ul style="list-style-type: none"> - 3-5 days to resolve symptoms + 2-3 days to ensure everything is dead (V. important to keep taking them even if you think the infection is done) -> 5-7 days total <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: red; color: white;"> <th style="text-align: center; padding: 5px;">Not Indicated</th> <th style="text-align: center; padding: 5px;">Indicated</th> </tr> </thead> <tbody> <tr style="background-color: red; color: white;"> <td style="text-align: center; padding: 5px; vertical-align: top;"> <ul style="list-style-type: none"> - Chronic localized abscess - Minor vestibular abscess - Dry Socket (this isn't an infection!) - Root canal sterilization - Mild pericoronitis </td> <td style="text-align: center; padding: 5px; vertical-align: top;"> <ul style="list-style-type: none"> - Rapid progression - Diffuse swelling (Cellulitis) - Lymphadenopathy - Compromised host defenses - Involvement of Facial spaces - Severe Pericoronitis - Osteomyelitis </td> </tr> </tbody> </table>	Not Indicated	Indicated	<ul style="list-style-type: none"> - Chronic localized abscess - Minor vestibular abscess - Dry Socket (this isn't an infection!) - Root canal sterilization - Mild pericoronitis 	<ul style="list-style-type: none"> - Rapid progression - Diffuse swelling (Cellulitis) - Lymphadenopathy - Compromised host defenses - Involvement of Facial spaces - Severe Pericoronitis - Osteomyelitis
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Antibiotics

Bactericidal (Kills)	Bacteriostatic (Prevents growth)
<ul style="list-style-type: none"> - Penicillins - Clindamycin - Cephalosporin - Metronidazole - Aminoglycosides - Vancomycin - Ciprofloxacin 	<ul style="list-style-type: none"> - Erythromycin - Clindamycin - Clarithromycin - Azithromycin - Tetracycline - Sulfa

Penicillin	G+ Aerobes Anaerobes
Amoxicillin Ampicillin	↑ G+ Cocci - Not really worth changing from Penicillin though
Amox/Clav (Augmentin) - Dr. Esmail's fav	↑ Staph + G- species - This combo is good for a broad spectrum alternative to Penicillins
Zosyn	Covers all odontogenic bacteria
Clindamycin	G+ Anaerobes
Flagyl	All Anaerobes

Dosages of Antibiotics

Penicillin	500mg QID - Kids: 25-50mg/kg/day
Amoxicillin	500mg TID - Kids: 20-50mg/kg/day
Azithromycin	500mg Day 1 -> 250mg Day 2-5 - Kids: 10 mg/kg Day 1 -> 5mg/kg Day 2
Clarithromycin	500mg BID - Kids: 7.5mg/kg/day
Metronidazole	500mg TID or QID - Kids: 7.5mg/kg/day
Clindamycin	150-600mg QID - Kids: 15-30mg/kg/day
Augmentin	875/125mg BID - Kids: 46-90mg/kg/day
Moxifloxacin	400mg 1x/day - Kids: NOT for kids

Indications for Endocarditis Proph

- Prosthetic Heart Valves
- Previous Endocarditis
- Cyanotic Congenital Heart Disease
 - Unrepaired CHD (palliative shunts, conduits)
 - Repaired congenital heart defects w/ prosthetic material
 - Repaired w/ residual defects at site of prosthetic patch/device
- Cardiac transplant recipients w/ cardiac valvulopathy

Dental Procedures Indicated:

- | | |
|--|--|
| <ul style="list-style-type: none"> - Extractions - Implant Placement - Retraction Cord placement - Intraligamentary LA | <ul style="list-style-type: none"> - Periodontal Surgery - Endo Tx beyond Apex - Ortho band placement - Scaling and Root Planing |
|--|--|

Drug	Dosage (1hr before Tx)
Amoxicillin	Adult: 2g Kids: 50mg/kg
Penicillin Allergy?	
Clindamycin	Adult: 600mg Kid: 20mg/kg
Cephalexin	Adult: 2g Kid: 50mg/kg
Azithromycin/Clarithromycin	Adult: 500mg Kid: 15mg/kg
Can't take Oral meds?	
Ampicillin	Adult: 2g IM or IV 30 min prior Kid: 50mg/kg IM or IV 30 mins prior
Can't take Penicillin OR oral meds?	
Clindamycin	Adult: 600mg IV Kid: 20mg/kg IV
Cefazolin	Adult: 1g IM or IV Kid: 25mg IM or IV