

Oral Surgery 1 — flaps, sutures, roots, impactions, fractures

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EXAM-DAY SUMMARY

everything on this page → detail in \$\$ overleaf

FLAP PRINCIPLES → §1

- Mucoperiosteal = dento-alveolar; split thickness = periodontal
- Sharp cut, blade ⊥ bone, to sulcus depth; raise blunt, easy → difficult
- **Base wider than length** → blood supply → healing

FLAP DESIGNS → §2

- Crestal = edentulous · envelope = dentate
- Triangular = +1 vertical → **most common** · trapezoidal = +2 verticals → lower anterior apicectomy
- Semilunar = upper anterior apicectomy (↑ haemorrhage, wound-margin damage) · scalloped (Ochsenbein–Luebke) = sub-marginal, avoids recession
- Avoid verticals: mental foramen · mesial root lower 7 (facial artery) · **never in palate** (greater palatine)

NEEDLES & SUTURES → §3

- Tapered = fine muscle/organs · cutting & reverse cutting = skin/mucosa
- 0 thickest → 11/0 thinnest; **3/0 & 4/0 intraorally**; thicker = stronger
- Resorbable: Dexon, Vicryl, Monocryl, chromic/plain gut · non-resorbable silk, nylon, prolene — out 4–6 d extraoral, 7–10 d intraoral
- Mono = no bacteria, hard handling (prolene, nylon, chromic gut) · poly = harbours bacteria, easy (silk, Vicryl)

ROOTS & APICECTOMY → §4

- Dentate → envelope · edentulous → crestal · apical third: upper ant/premolar semilunar, lower ant three-sided, lower premolar two-sided
- Leave fragments **< 3 mm** (warn, antibiotic, follow-up); remove if large, symptomatic, prosthetic, immunocompromised
- LA 2 teeth either side; amoxicillin 1 g / metronidazole 400 mg 1 h pre-op + 6 h post-op; excise 2 mm apex → MTA
- Orthograde 78–88% · apicectomy + RRF 90%

M3M — DECIDE → §5.4

- No routine screening of symptomless disease-free 8s; Montgomery consent incl. non-surgical
- **Mesial/horizontal 30–90° → distal caries in lower 7**
- High risk but close to IAN → active surveillance; prophylactic removal if bisphosphonates/chemo, H&N radiotherapy, immunosuppression, 8 in surgical field

IAN & CLASSIFICATION → §5.3, §5.5

- Tramlines lost / narrowed / deflected; band across root; perforation, grooving, notching
- Injury: **temporary 8%** · **permanent 3.8%**
- Pell & Gregory depth A/B/C + ramus I/II/III; Winter = angulation

CORONECTOMY → §5.6

- Crown off, roots left, **pulp untreated**; for chemo, radiotherapy, bisphosphonates, IAN risk
- **✗** local infection · non-vital · mobile · horizontal or distoangular; alternatives: operculectomy, occlusal reduction or extraction of opposing

COMPLICATION RATES → §6.2

- Dry socket 4–5% routine → **up to 30% surgical 8s**
- IAN temp ~8% / perm ~3.8% · lingual temp ~2% / perm ~0.5%

ANTIBIOTICS → §6.3–6.4

- Post-op: NSAID · steroids for swelling · broad spectrum only if acute infection or bone removal · CHX rinse
- Prophylaxis (immunocompromised, previous dry socket): one dose **1–2 h pre-op**
- Pericoronitis: local measures first; antibiotic only if fever, spreading/severe infection, persistent swelling, trismus
- Amoxicillin 500 mg TDS ± metronidazole 400 mg TDS × 3 d; allergy → clarithromycin 500 mg BD or clindamycin 300 mg QDS × 3 d
- Osteomyelitis/ORN: surgery + culture-guided antimicrobials ≥ 4–6 weeks

DRY SOCKET → §6.5

- Pain **3–4 days post-extraction, up to 10 days**
- Antibiotics contraindicated without spread; irrigate (saline — CHX caused 2 allergy deaths) → Alvogyl → NSAID → review 24–48 h

IMPACTED UPPER 3 → §7

- Palpation + parallax to localise
- Buccal → buccal flap · palatal → **6 to 6 bilateral, 6 to contralateral 3 unilateral** · in-arch → both

FRACTURES → §8

- Mandible: **condyle 33%** · angle 20 · body 20 · parasymphysis 13 · symphysis 11 · ramus 2 · coronoid 1; guardsman's = bilateral (para)symphyseal + bilateral condylar
- Dentate → IMF · edentulous → ORIF · dentoalveolar splint 4 weeks · condyle affecting occlusion → IMF 2 weeks
- Retrobulbar haemorrhage → immediate decompression + mannitol/acetazolamide + dexamethasone
- Blow-out: floor weakest → hanging-drop → mesh graft; Le Fort II frontonasal, III + bilateral frontozygomatic

TRAUMA VIEWS → §9

- **Occipitomental = middle third**, Le Fort I–III, orbital floor, coronoid
- PA = mandible/angle/low condyle · reverse Towne's = high condylar neck · true lateral = cranial base, vault · SMV = zygomatic arch, palate

§1 Flap design — principles

- **Mucoperiosteal (full thickness):** mucosa + periosteum raised off bone → **dento-alveolar surgery** (Fig. 1A)
- **Split thickness (partial):** periosteum left on bone → **periodontal surgery** (Fig. 1B)

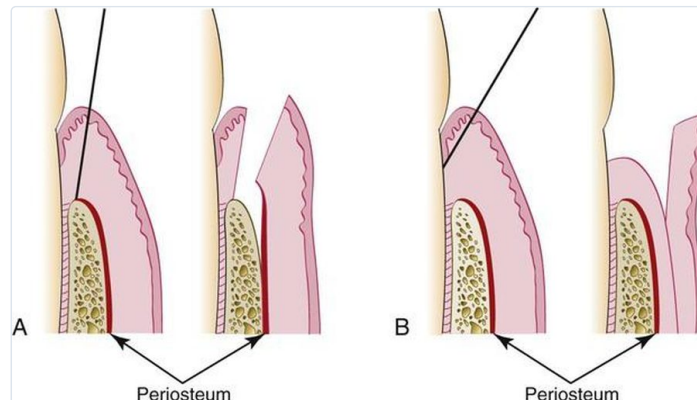


Fig. 1 — A: mucoperiosteal flap, periosteum lifted with the flap (dento-alveolar surgery). B: split-thickness flap, periosteum stays on bone (periodontal surgery).

1.1 Incision

1. **Sharp clean cut:** single firm stroke **X** ragged repeated strokes
2. **Blade at right angle to bone:** perpendicular contact → full-thickness cut in one pass
3. **Depth of gingival sulcus:** crevicular incision carried to bone
4. **Base wider than length:** ★ **broad base = better blood supply** → **better healing**

1.2 Raising the flap

- **Blunt instrument:** periosteal elevator, subperiosteal plane
- **Direction:** start where the flap lifts easily → progress to the difficult area

KEY POINTS

Full thickness = dento-alveolar · split thickness = periodontal. Sharp cut · blade $\perp$ bone · to sulcus depth · **base wider than length**.
Raise blunt, easy → difficult.

§2 Mucoperiosteal flap designs

2.1 Simple crestal / envelope flap

- **Crestal:** incision along the ridge crest → **edentulous** areas
- **Envelope:** crevicular incision around necks of teeth, no vertical → **dentate** areas
- **Uses:** extraction of remaining roots · vertically impacted wisdom tooth

2.2 Two-sided flap {three-corner · triangular}

- **Design:** simple crestal/envelope + **one** vertical relieving incision
- **Frequency:** ★ **most commonly used flap**
- **Relieving incision — avoid:** mental foramen area · buccal branch of facial artery (at the **mesial root of the lower 7**)
- **Palatal flaps:** no relieving incision in palate → protects greater palatine artery

2.3 Three-sided flap {four-corner · trapezoidal}

- **Design:** one simple crestal/envelope + **two** vertical releasing incisions
- **Use:** lower anterior area apicectomy

2.4 Semilunar flap

- **Use:** apicectomy · extraction of apical root fragment, **maxillary anterior** area → gingival margin untouched, avoids recession
- **Drawbacks:** increased haemorrhage · overextension needed for visibility · damage to wound margins

2.5 Scalloped flap {Ochsenbein-Luebke · sub-marginal}

- **Design:** scalloped horizontal incision in attached gingiva, below the margin → **avoids recession**

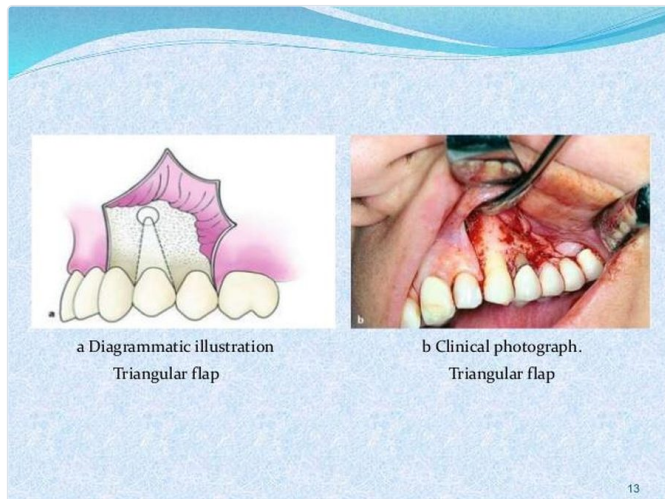


Fig. 2 — Triangular (two-sided): envelope + one vertical.

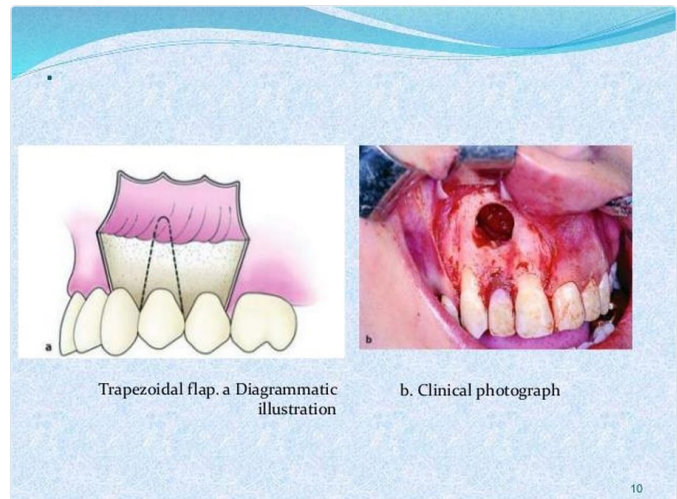


Fig. 3 — Trapezoidal (three-sided): envelope + two verticals.

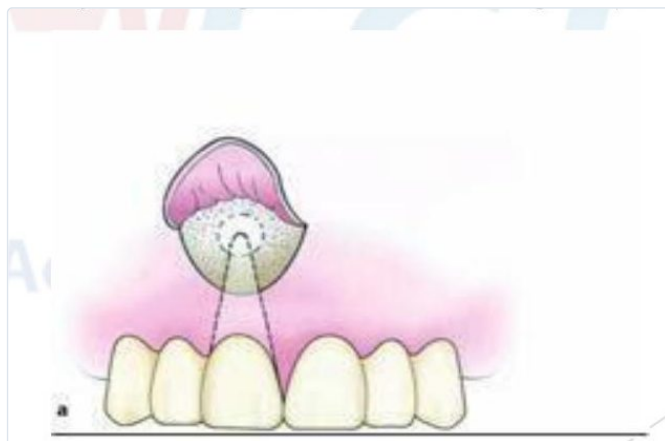


Fig. 4 — Semilunar: curved incision in mucosa, gingival margin preserved.



Fig. 5 — Scalloped (Ochsenbein-Luebke): sub-marginal, follows gingival contour.

Table 1 — Mucoperiosteal flap designs at a glance

Design	Incision	Main use	Watch-out
Crestal	Along ridge crest	Edentulous areas · retained roots	—
Envelope	Crevicular, no vertical	Dentate areas · vertical impacted 8	Limited access
Two-sided (triangular)	Envelope + 1 vertical	Most common general-purpose flap	Mental foramen · facial artery buccal branch (mesial root lower 7)
Three-sided (trapezoidal)	Envelope + 2 verticals	Lower anterior apicectomy	Most tissue trauma
Semilunar	Curved, in mucosa only	Apicectomy / apical fragment, upper anterior	Haemorrhage · overextension · wound-margin damage
Scalloped (sub-marginal)	Scalloped, in attached gingiva	Apical surgery where recession matters (crowns)	Needs adequate attached gingiva

2.6 Danger zones for relieving incisions

- **Mandible:** mental foramen (mental nerve/artery) · buccal branch of facial artery at mesial root of lower 7
- **Palate:** greater palatine artery → **★never place a vertical relieving incision in the palate**
- **Regional supply:** external carotid → facial · lingual · maxillary → infra-orbital, buccal, mental branches; superficial temporal → transverse facial

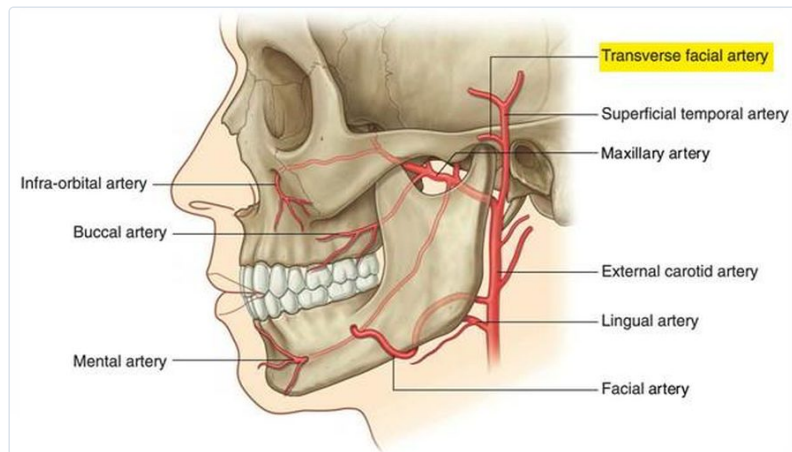


Fig. 6 — Arterial map: external carotid → facial, lingual, maxillary (infra-orbital, buccal, mental) and superficial temporal → transverse facial.

★ EXAM PEARL

Two flap questions repeat: **triangular = most common**, and **palatal flaps get no vertical relieving incision** (greater palatine artery). Semilunar and scalloped exist for one reason — protecting the gingival margin from recession.

§3 Suturing — needles and materials

3.1 Needle

- **By tip — tapered (non-cutting)**: round body, spreads tissue → fine muscles and organs
- **By tip — cutting / reverse cutting**: triangular point → ★ **skin and mucosa (oral surgery default)**
 - conventional cutting: cutting edge on the **inner** (concave) curve · reverse cutting: cutting edge on the **outer** (convex) curve
- **By curvature (body/shaft)**: ½ circle · 3/8 circle · ¼ circle · 5/8 circle · J-shaped · compound curve · ½ curved · straight

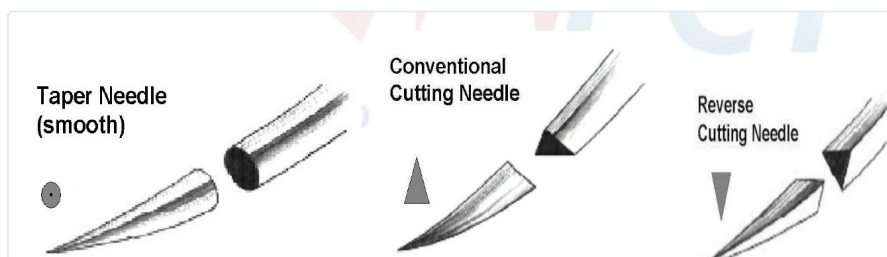


Fig. 7 — Needle points: taper (smooth, round cross-section), conventional cutting (apex on inner curve), reverse cutting (apex on outer curve).

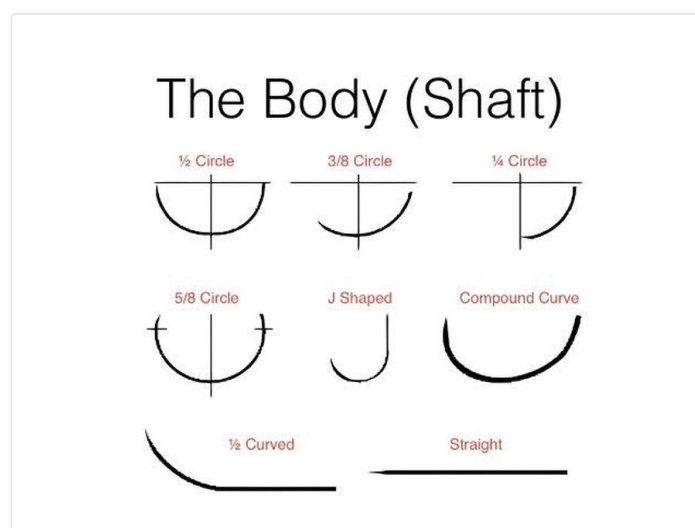


Fig. 8 — Needle body: ½, 3/8, ¼, 5/8 circle, J-shaped, compound curve, ½ curved, straight.

3.2 Suture material

- **Sizing runs backwards: 0 = thickest · 11/0 = thinnest** → more zeros = finer
 - 3/0 is thicker than 4/0 · thicker = stronger · ★ **3/0 and 4/0 most commonly used intraorally**

- **Resorbable:** for inaccessible areas where suture removal is a challenge **and** a scar is not a problem
 - Dexon · Vicryl · Monocryl · chromic gut · plain gut
- **Non-resorbable:** silk · nylon · polypropylene (prolene)
 - removal ★4–6 days extraorally · 7–10 days intraorally

Table 2 — Monofilament vs polyfilament (braided)

	Monofilament	Polyfilament
Bacteria	Does not harbour bacteria	Harbours bacteria (wicking)
Handling	Difficult manipulation	Easy manipulation
Examples	Prolene · nylon · chromic gut	Silk · Vicryl

★ EXAM PEARL

Slide correction: the deck labels **Dexon** as "polyglactin". Dexon is **polyglycolic acid (PGA)**; **Vicryl** is polyglactin 910 — check the trade-name/polymer pairing before an SBA. Also note silk is non-resorbable *and* braided → the classic "worst for infection, best for handling" answer.

§4 Retained roots and apicectomy

4.1 Extraction of a remaining root

- **First decision:** assess the need for **separation** (sectioning) of the root(s)
- **Non-surgical:** root forceps or elevators
- **Surgical — flap by site:** dentate → envelope · edentulous → crestal
- **Surgical — apical third:** upper anteriors & premolars → semilunar · lower anteriors → three-sided · lower premolars → two-sided

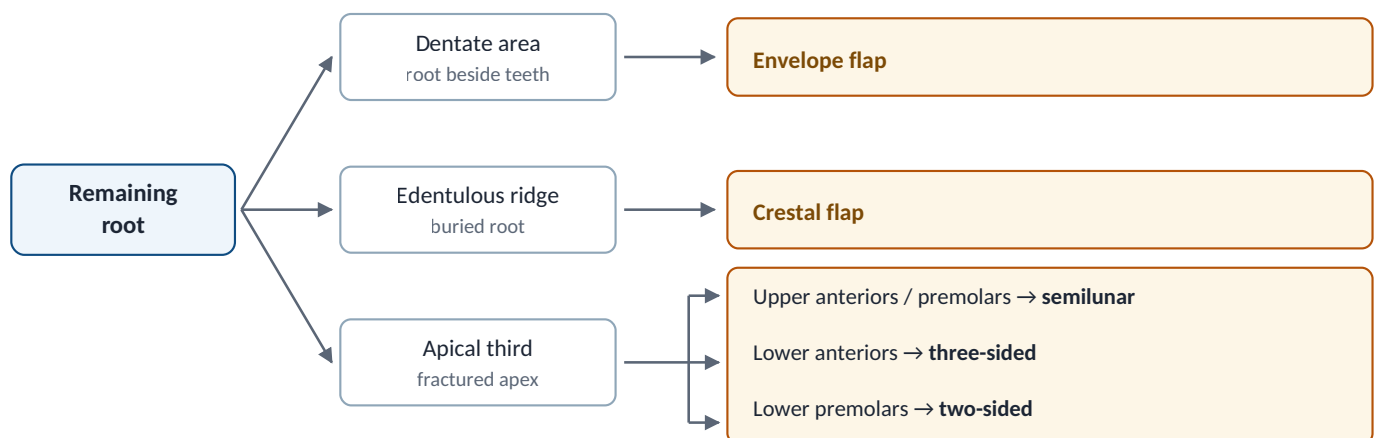


Diagram 1 — Flap selection for a retained root, by site and level (lecture content re-drawn).

4.2 Fractured apical segment — leave or retrieve?

- **Acceptable to leave:** small fragments ★< 3 mm → inform the patient · provide antibiotic · follow up
- **Retrieve if:** large · symptomatic · needed for prosthetic purposes · immunocompromised patient

4.3 Apicectomy — indications and outcome

- **When orthograde is blocked or has failed:** pulp calcification · severe curves · broken file · post crown on a tooth with apical pathology · root perforation · persistent infection
- **Success:** non-surgical (orthograde) treatment ★78–88% · apicectomy + retrograde root filling (RRF) ★90%

4.4 Apicectomy — technique

1. **Anaesthesia:** field extends **two tooth widths either side** of the tooth
2. **If infection present:** prophylactic antibiotic — amoxicillin 1 g **or** metronidazole 400 mg, **1 h pre-op and 6 h post-op**
3. **Flap:** as for apical-third root removal (semilunar / three-sided / two-sided by site)
4. **Locate apex:** bone bulge or perforation → create a bony window

5. **Resect:** excise **2 mm** of the apex · curette the lesion out
6. **Haemostasis:** pack the cavity with bone wax or adrenaline-soaked gauze
7. **Seal + close:** retrograde seal with **MTA** → suture
- **Upper 4 (two roots):** cut the buccal root **low** → gives sight of the palatal root

★ **EXAM PEARL**

Numbers examiners like here: fragment threshold < **3 mm**, apical resection **2 mm**, anaesthesia **two teeth either side**, and the success pair **78–88% orthograde vs 90% apicectomy + RRF** — surgery is the salvage, not the first line.

§5 Impacted mandibular third molar — assessment and decision

5.1 History and clinical assessment

- **Start with history:** thorough medical, social and dental history focused on symptoms attributable to the third molar
- **Overall dental health:** assessed before any third-molar decision
- **Assess the third molar itself:** eruption status · position relative to the adjacent second molar · function and occlusion · periodontal and caries status
- **Don't stop at one tooth:** opposing, contralateral and maxillary third molars also assessed

5.2 Radiographs

- **No routine screening:** ★ **radiographic screening of unerupted third molars with no disease or symptoms is not recommended**
- **Panoramic indicated to:** assess when surgical intervention is being considered · determine presence/absence of disease in the tooth or surrounding area · determine tooth anatomy and root formation · determine relationship to relevant structures (inferior alveolar nerve [IAN], adjacent second molar)

5.3 Signs of IAN proximity

- **Tramline signs:** loss of tramlines · narrowing of tramlines · change in direction (deflection) of tramlines
- **Root signs:** radiolucent band across the root · perforation, grooving or notching
- **If proximity found:** quantify and consent for nerve risk → ★ **temporary loss of sensation 8% · permanent 3.8%**; consider CBCT, coronectomy or surveillance



Fig. 9 — Impacted lower 8 superimposed on the IAN canal; arrowheads mark the canal as it crosses the roots.

5.4 Decision framework — Parameters of Care (2020)

- **Principle:** assess current status of patient **and** tooth, plus the chance of both changing → symptom and disease status may change over time, so treatment options and risks change too
- **Consent:** **Montgomery** principles → patient made aware of benefits and risks of **each** option, **including non-surgical treatment**
- **Current status assessed by:** history (medical, social, dental) · clinical examination · appropriate radiological investigations
- **Factors weighed alongside:** patient age and medical status · risk of complications (IAN injury, and the risk of leaving the M3M in situ) · patient access to treatment (army personnel on long deployment, long-term travel) · status of opposing/contralateral third molar if the patient is having a general anaesthetic

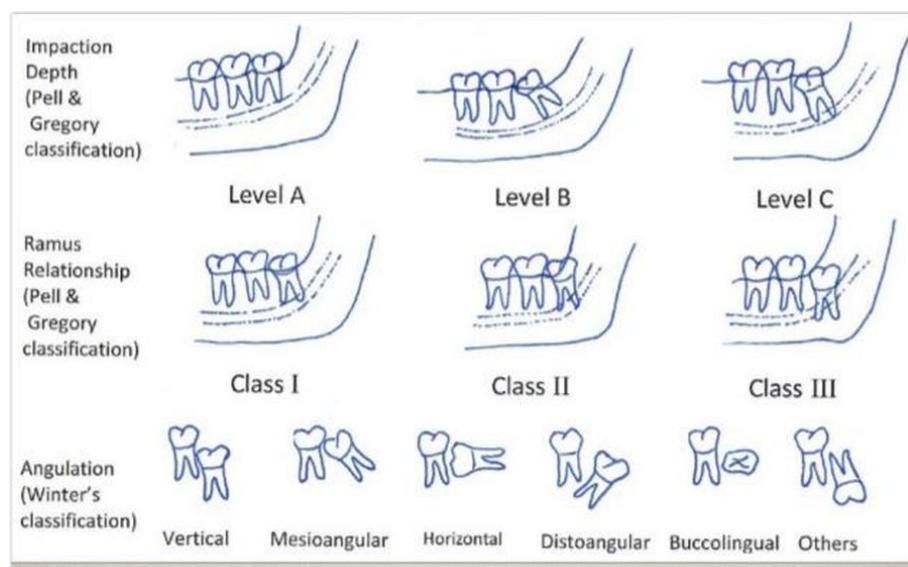
- **High risk of dental disease:** significantly increased risk of **distal caries in the adjacent lower 7** from partially erupted third molars angulated **★horizontally or mesially between 30° and 90°** → also periodontal detriment to the 7 → intervene "sooner" rather than "later"

Table 3 — Management matrix for mandibular third molars (M3Ms), Parameters of Care 2020

	Diseased / high risk of disease development	Non-diseased / low risk of disease development
Asymptomatic	Clinician grades likelihood of disease as high or low risk. High risk → consider surgical intervention. If in doubt and higher risk of surgical complications (close approximation to IAN) → active surveillance until symptoms develop or early disease progression is proven. Quiescent pathology may include undiagnosed second or third molar: caries · periodontal disease · resorption (internal or external) · cysts or tumours.	Clinical review ± radiographic assessment if indicated; assess risk of disease and set a review interval. Factors favouring prophylactic removal — medical: planned treatment that would complicate later surgery — pharmaceutical therapy (bisphosphonates, antiangiogenics, chemotherapy), head and neck radiotherapy, immunosuppressant therapy. Surgical (M3M lies within the surgical field): mandibular fractures · orthognathic surgery · resection of disease (benign and malignant lesions).
Symptomatic	Therapeutic extraction indicated for: single severe acute or recurrent subacute pericoronitis · unrestorable caries of the M3M or caries where removal assists restoration of the adjacent tooth · periodontal disease compromising the M3M and/or adjacent tooth · resorption of the M3M and/or adjacent tooth · fractured M3M · periapical abscess, irreversible pulpitis or acute spreading infection · surrounding pathology (cysts or tumours). Treatment: therapeutic removal of M3M (or coronectomy) · removal of the upper third molar.	Leave deeply impacted M3Ms with no associated disease. Look elsewhere for the pain: temporomandibular disorders · parotid disease · skin lesions · migraine or other primary headaches · referred pain from angina or cervical spine · oropharyngeal oncology.

5.5 Classification of the impaction

- **Pell & Gregory — depth:** **Level A** occlusal plane of 8 level with 7 · **B** between occlusal plane and cervical line of 7 · **C** below cervical line of 7
- **Pell & Gregory — ramus relationship:** **Class I** sufficient space between ramus and distal of 7 · **II** about half the crown covered by ramus · **III** tooth entirely within the ramus
- **Winter — angulation:** vertical · mesioangular · horizontal · distoangular · buccolingual · others

**Fig. 10** — Pell & Gregory depth (A/B/C) and ramus relationship (I/II/III); Winter's angulation across the bottom row.

5.6 When surgery is contraindicated — and the alternatives

- **Contraindications to removal:** active chemotherapy · active radiotherapy · patient on bisphosphonates · risk of damage to the IAN
- **Alternatives:** no treatment · operculectomy · occlusal reduction of the opposing tooth · extraction of the opposing tooth · coronectomy
- **Coronectomy:** partial tooth removal — **crown only**, roots left in situ, **pulp left untreated**
 - indications mirror the contraindications above: active chemo, active radiotherapy, bisphosphonates, IAN risk

CAUTION

Coronectomy is contraindicated in: local infection · non-vital tooth · mobile tooth · **horizontal or distoangular impaction** (roots cannot be left safely / crown cannot be separated without mobilising the roots).

★ EXAM PEARL

The single most-asked M3M fact: **30–90° mesioangular/horizontal** → **distal caries in the lower 7**. Second most-asked: coronectomy leaves the pulp **untreated**, and a **mobile or non-vital** tooth rules it out.

§6 Third molar surgery — complications and antimicrobials

6.1 Post-operative therapeutics

- **Analgesia:** NSAID
- **Swelling:** steroids
- **Antibiotics:** broad spectrum, only where there is acute infection or bone removal
- **Rinse:** chlorhexidine mouthwash to reduce dry socket

6.2 Complications

- **Surgical sequelae (expected):** swelling · pain · bleeding · trismus · sensitivity of adjacent teeth
- **Significant complications:** dry socket · IAN injury · lingual nerve injury · damage to adjacent teeth or restorations · displacement of the tooth into the antrum/sinus

Table 4 — Quoted complication rates

Complication	Quoted rate
Dry socket (alveolar osteitis)	4–5% routine extraction · up to ~30% surgical third molars
IAN — temporary	~8%
IAN — permanent	~3.8%
Lingual nerve — temporary	~2%
Lingual nerve — permanent	~0.5%

The deck quotes dry socket as 5% for routine extractions on the complications slide and ~4% on the guideline slide; both give up to 30% for surgical third molars.

6.3 Prophylactic antibiotics

- **Consider when:** increased risk of complications due to infection (e.g. immunocompromised patient) · history of previous alveolar osteitis → **one pre-operative dose**
- **Timing:** aim for an effective serum level at the time of surgery → **★give 1–2 hours before**

6.4 Therapeutic antibiotics (guideline pp. 66–67)

- **Pericoronitis — local measures first (evidence grade C):** debridement and irrigation · abscess drainage · operculectomy · occlusal adjustment or extraction of the opposing tooth · extraction of the impacted tooth if more than one episode, once infection is under control
- **Antibiotic only if:** fever · spreading infection · severe localised infection · persistent swelling despite local measures · trismus
- **Post-operative infection (grade B2):** local measures such as surgical debridement/drainage in localised infection; antibacterial therapy indicated in severe infection with systemic signs and symptoms of sepsis and/or evidence of local spread

Table 5 — Antimicrobial regimens (odontogenic infection)

	First line — no penicillin allergy	First line — penicillin allergy	Second line (both)
Pericoronitis (acute/chronic)	Amoxicillin 500 mg TDS ± metronidazole 400 mg TDS for 3 days (by severity) + chlorhexidine or hydrogen peroxide mouthwash	Clarithromycin 500 mg BD for 3 days or clindamycin 300 mg QDS for 3 days (by severity) + chlorhexidine or hydrogen peroxide mouthwash	Severe spreading infection → refer for inpatient surgical management and intravenous antimicrobial therapy
Post-operative infection	Amoxicillin 500 mg TDS for 3 days	Clarithromycin 500 mg BD for 3 days	

- **Microbiology (MC&S):** indicated in severe infection with purulent discharge → **aspirate of pus is the best specimen**; alternative pus swab in Amies charcoal transport medium
- **Osteomyelitis / osteonecrosis / osteoradionecrosis (grade C):** combined surgical **and** antimicrobial approach; culture and susceptibility testing is **mandatory**; close liaison between clinical team and oral or medical microbiologist is critical for long-term success
 - specimens: high-quality diagnostic samples (multiple bone biopsies) uncontaminated by saliva
 - empiric cover: **Streptococcus anginosus group + oral anaerobes**; add **Staphylococcus aureus** cover in complicated histories
 - duration ★ **at least 4–6 weeks**; prolong if actinomycetes isolated; consider prolonged IV and outpatient antimicrobial therapy

6.5 Alveolar osteitis / dry socket (evidence grade A)

- **Timing:** usually ★ **3–4 days after extraction** · **lasts up to 10 days**
- **Aetiology:** surgical trauma · localised infection · systemic factors
- **Management is local:** radiograph if necessary to exclude foreign body or retained root → irrigate to remove debris → pack with a suitable dressing (e.g. Alvogyl) → NSAID analgesia → review at 24–48 h

CAUTION

No antibiotics for dry socket in the absence of spreading infection — antibiotic therapy is contraindicated. **Chlorhexidine irrigation of open sockets:** use with caution following **two deaths from type 1 allergic reactions** → a non-allergenic irrigant such as **sterile saline** is recommended.

★ EXAM PEARL

Dry socket is a **local-measures-only** diagnosis: pain 3–4 days post-extraction, no pus, no systemic upset → dress it, don't prescribe. The lecture also recommends chlorhexidine mouthwash to prevent dry socket while the guideline warns against chlorhexidine *irrigation* of open sockets — rinse ≠ flush.

§7 Impacted maxillary canine

- **First question — buccal or palatal?:** palpation · **parallax technique** radiographs (tube shift: object moves with the tube = palatal/lingual)
- **Buccal position:** buccal flap
- **Palatal position:** palatal flap — ★ **6 to 6 if bilateral** · **6 to contralateral 3 if unilateral**
- **Within the arch (mid-alveolar):** combination of buccal and palatal flaps

★ EXAM PEARL

Localisation before access, always: palpation then parallax. A palatal canine gets a wide envelope palatal flap (no relieving incision — greater palatine artery), which is why the extent is described in tooth units rather than by verticals.

§8 Maxillofacial fractures

8.1 Definitions, aims and complications

- **Simple fracture:** closed — skin and mucosa intact
- **Compound fracture:** more than one tissue injured — exposed/open — involves skin, mucosa and bone
- **Aims of treatment:** restore function and aesthetics → **reduction** of the fracture → **fixation**
- **Complications:** mal-union · delayed union · non-union · site infection

8.2 Mandibular fracture

Table 6 — Distribution of mandibular fracture sites

Site	%	Site	%
Condyle	33	Symphyseal	11
Angle	20	Ramus	2
Body	20	Coronoid	1
Parasymphyseal	13		

- **Commonest site:** ★condyle 33% → then angle and body at 20% each
- **Guardsman's fracture:** bilateral symphyseal, parasymphyseal **and bilateral condylar** fracture (fall onto the chin)
- **Clinical findings:** abnormal bone mobility · step deformity · palpable, tender fracture line · malocclusion · sublingual haematoma · lacerations · anaesthesia or paraesthesia
- **Management:** antibiotics + analgesics → **closed reduction and IMF in dentate patients** · **open reduction and internal fixation in edentulous patients** → functional rehabilitation
- **Dentoalveolar fracture:** splint for **4 weeks**
- **Condylar fracture:** not interfering with occlusion → soft diet and review · interfering with occlusion → ★IMF for 2 weeks

8.3 Zygomatic complex and orbit

CAUTION

Retrobulbar haemorrhage is a very serious sign → immediate surgical decompression. Medical management: diuretics (mannitol, acetazolamide) and dexamethasone (anti-inflammatory and antiedematous).

- **Diagnosis of zygomatic fracture:** flattening of the cheek bone · subconjunctival haemorrhage · paraesthesia under the eye (infra-orbital nerve) · diplopia · limited lateral movement of the mandible
- **Orbital blow-out:** the **floor** is the weakest point of the orbit and most liable to fracture with a direct blow to the face → ★"hanging drop" / "trap door" sign → treated by bone graft ("mesh graft")
- **Reduction of the arch/complex:** Gillies approach (extraoral) · Keen's approach · Carroll–Gerard approach
- **If comminuted:** needs ORIF

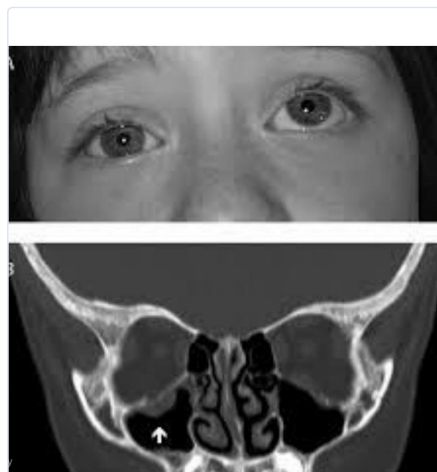


Fig. 11 — Orbital blow-out. A: clinical restriction of upgaze. B: coronal CT — orbital contents herniating through the floor into the antrum (arrow), the "hanging drop".

8.4 Maxillary fracture — Le Fort levels

- **Le Fort I: low horizontal** fracture involving the floor of the nose; continuing posteriorly it separates the maxilla
- **Le Fort II: high-level horizontal, pyramidal** — involves the frontonasal suture, runs backward and downward → separates the nose and mouth from the skull
- **Le Fort III: highest horizontal** — frontonasal suture + complete bilateral frontozygomatic sutures → **craniofacial dysjunction: midface separated from the skull**
- **Management:** ORIF · or closed reduction with indirect fixation ("suspension wires")

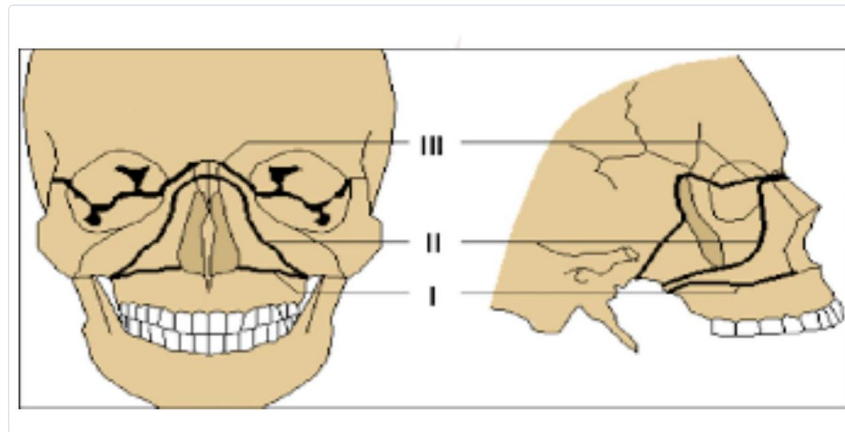


Fig. 12 — Le Fort levels I, II and III in frontal and lateral projection.

★ EXAM PEARL

Le Fort levels are defined by **which suture is involved**, not by height alone: II = frontonasal, III = frontonasal **plus bilateral frontozygomatic**. The two trauma emergencies to name out loud are **retrobulbar haemorrhage** (decompress now) and airway compromise in bilateral parasymphyseal (guardsman's) fractures.

§9 Radiographic views in facial trauma

Table 7 — Plain-film views and what each is for

View	Indications
Occipitomenal (Water's), 30°	Le Fort I, II and III · orbital floor fracture · coronoid process fracture · middle-third facial fractures · maxillary and frontal sinuses
Posteroanterior (PA)	Mandibular fractures · angle fracture · low condylar fracture
Reverse Towne's	High condylar neck fracture · intracapsular fracture · posteroanterior wall of the maxillary sinus (cassette placed vertically)
True lateral	Cranial base fractures · middle-third facial fractures · fractures of the skull vault (calvarium)
Submentovertex (SMV)	Zygomatic arch fracture · destructive lesions in the palate

30° Occipitomenal

Indications:

- Middle third facial fracture
- Coronoid process fracture
- Maxillary and frontal sinuses

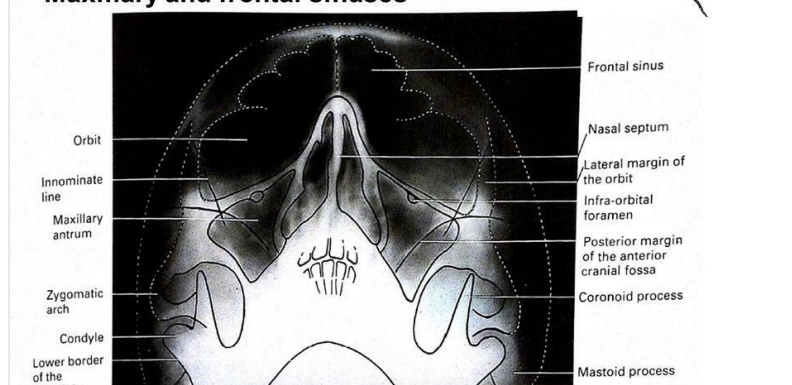


Fig. 13 — 30° occipitomenal (Water's): indications and labelled landmarks — orbit, innominate line, maxillary antrum, zygomatic arch, condyle, coronoid process, frontal sinus, nasal septum, infra-orbital foramen.

★ EXAM PEARL

Match the view to the level: **middle third and orbital floor** → **occipitomenal**; **mandible and angle** → **PA**; **condylar neck** → **reverse Towne's**; **zygomatic arch** → **submentovertex**. That four-way split answers most single-best-answer radiology stems in this topic.