

Dental anatomy

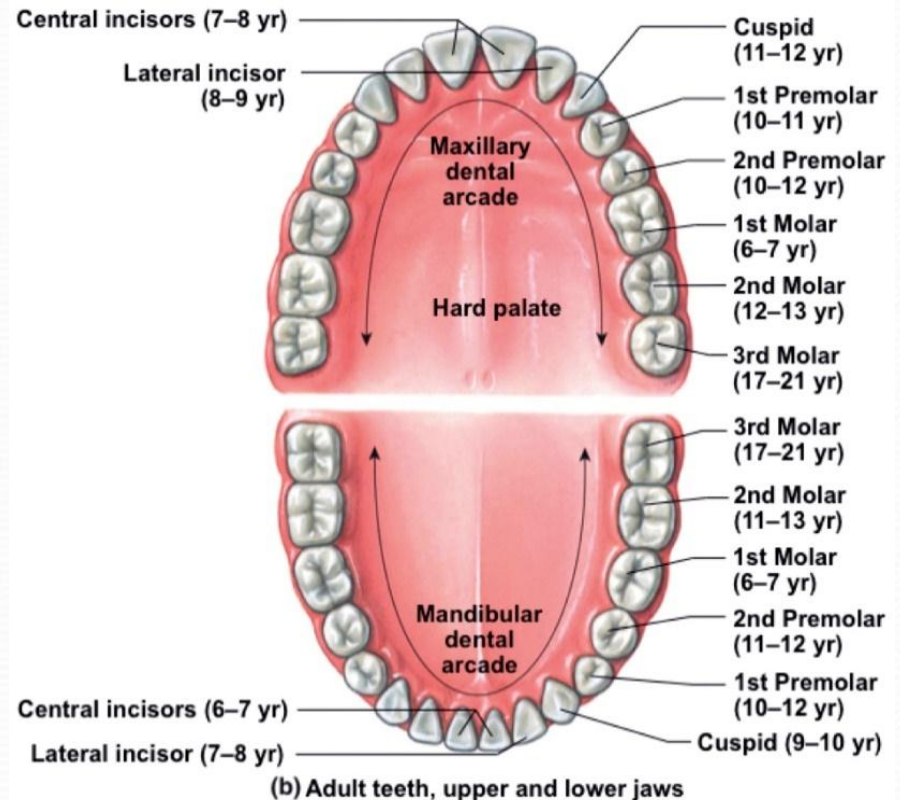
Lecture

Permanent mandibular
molars



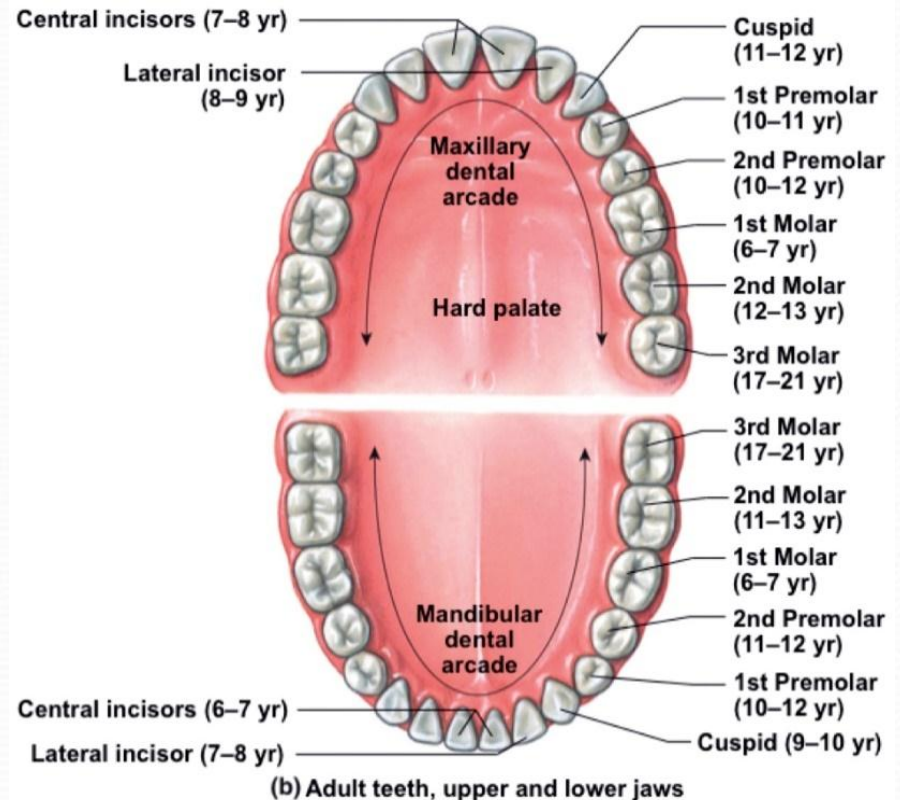
Permanent mandibular 1st molar

- Generally, it opposes the (upper) first molar and second premolar in normal class I occlusion.
- The first molar is usually the first permanent tooth to erupt.



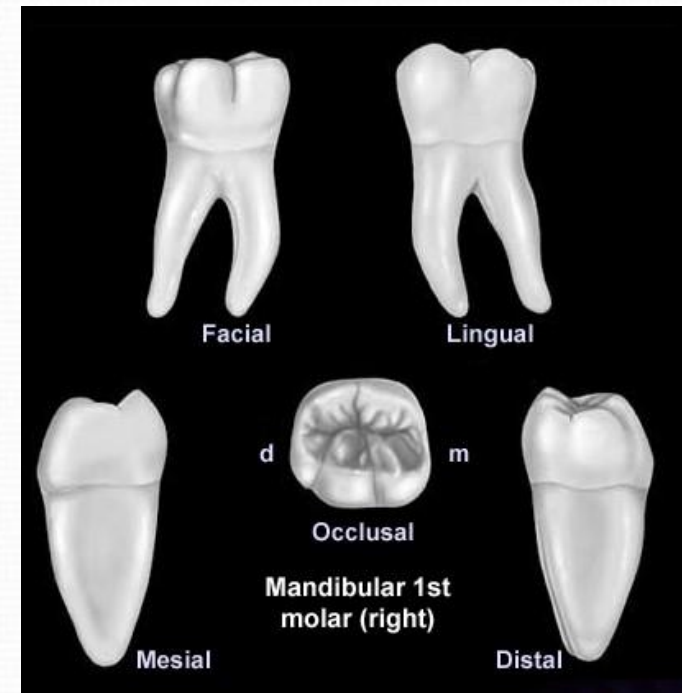
Permanent mandibular 1st molar

- The **function is similar** to that of **all molars** in regard to grinding being the principal action during mastication (chewing).
- The permanent mandibular molars are non-succedaneous teeth, the deciduous molars are followed by the permanent premolars.



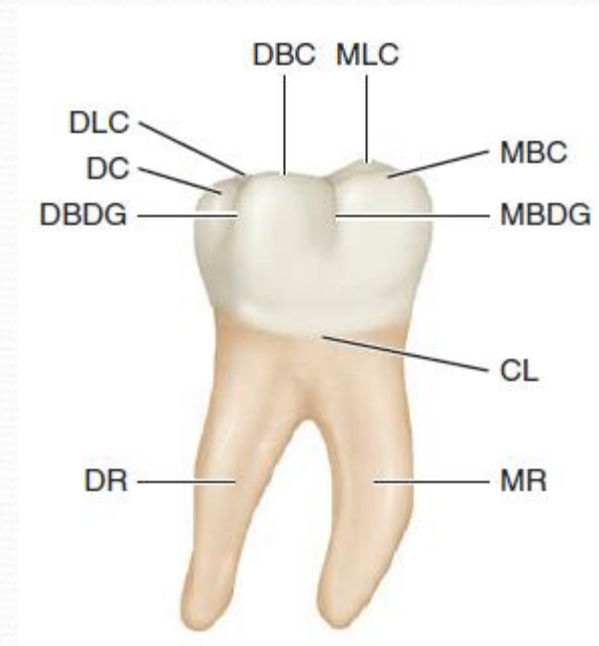
Principle identifying features of the permanent mandibular 1st molar

- It is the **largest** tooth in the mandibular arch. Its occlusal surface is **rectangular** in shape.
- Usually, it has **five well-developed cusps**, two buccally, two lingually, and one distal.
- It has **two well-developed roots**, one mesial and one distal.
- dimension of the crown mesiodistally is greater by about 1 mm than the dimension buccolingually.



Buccal aspect

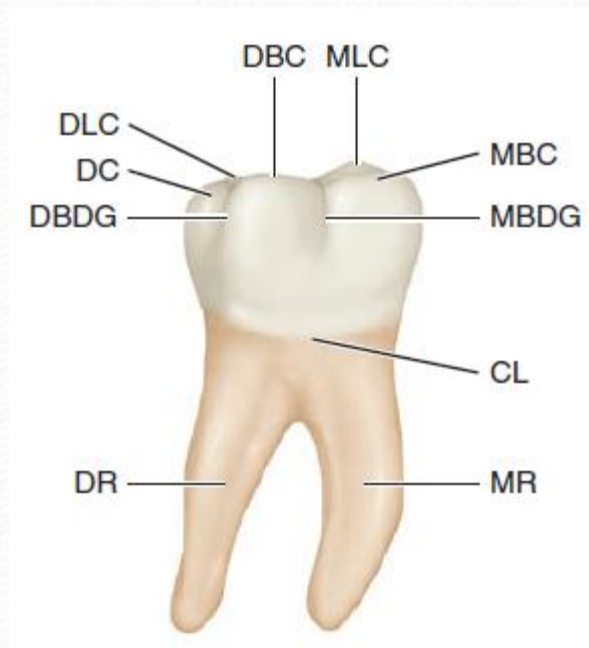
- The buccal surface has **two grooves**. The buccal (mesiobuccal) groove, which acts as a line of demarcation between mesiobuccal and distobuccal cusps or lobes. The distobuccal groove separates the distobuccal cusp or lobe from the distal cusp or lobe.
- The **mesial contact area** is at the **junction of the occlusal and middle thirds**. While, the **distal contact area** is a little bit **lower** than the mesial contact area.



Mandibular right 1st molar

Buccal aspect

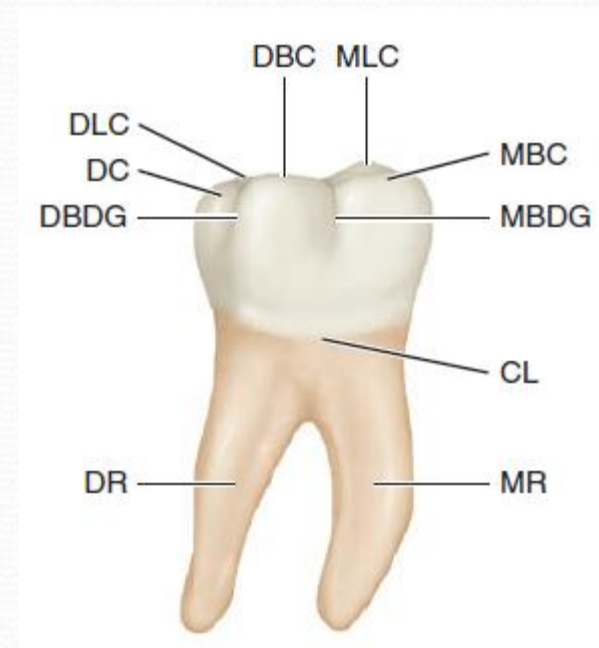
- The **two buccal cusps** make up the major portion of the buccal surface, **80%** of the mesiodistal width of the crown. The **distal cusp** provides a very small part of the buccal surface, **20%** of the mesiodistal width of the crown.
- If this tooth is posed vertically, **all of its five cusps can be seen**. The two buccal cusps, the buccal portion of the distal cusp, and the tips of the lingual cusps in the background can be seen. The **lingual cusps are higher than the others**.



Mandibular right 1st molar

Buccal aspect

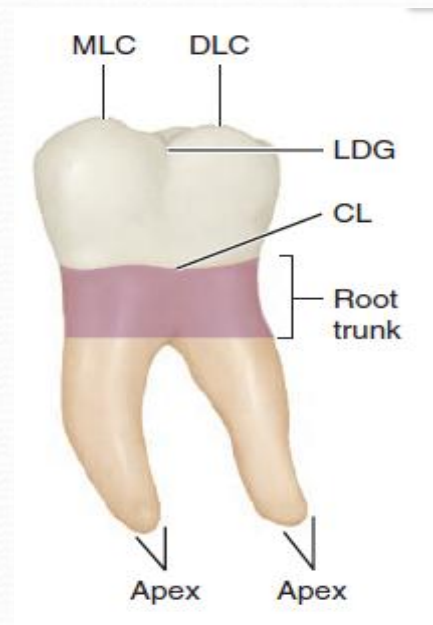
- The cervical line is curving regularly in apical direction.
- Two roots are present and well formed. The distal root is generally straighter, although both often have a slight distal curvature.
- The point of bifurcation of the two roots is located approximately 3 mm below the cervical line.



Mandibular right 1st molar

Lingual aspect

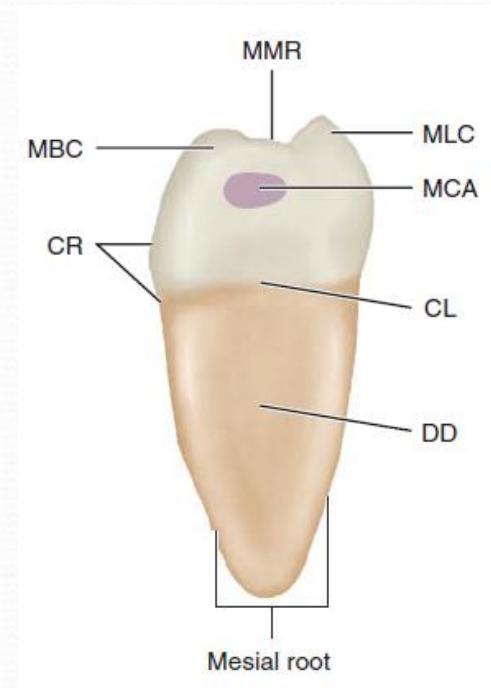
- Three cusps can be seen, the mesiolingual, the distolingual and the lingual portion of the distal cusp. The mesiolingual cusp is the widest mesio-distally and has the highest cusp tip, while the distal cusp has the lowest cusp tip.
- The 2 lingual cusps are pointed and form obtuse angle at their cusp tips.
- The lingual developmental groove acts a line demarcation between the 2 lingual cusps and it extends around 1 third of the crown cervically.



Mandibular right 1st molar

Mesial aspect

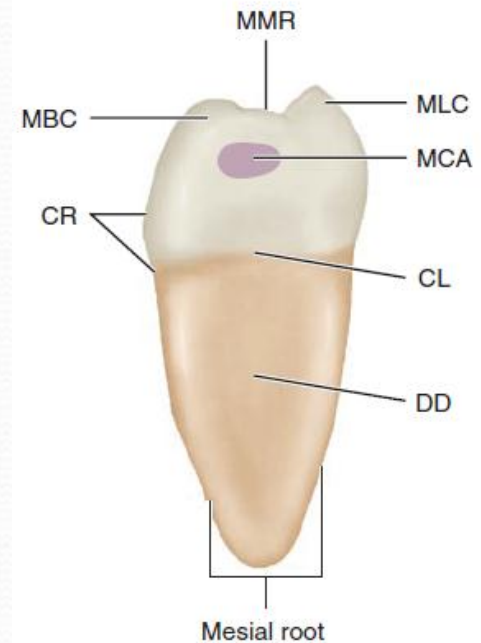
- The crown from the **mesial or distal aspect** is **roughly rhomboidal** with lingual tilt of the crown.
- the buccal outline of the crown is convex immediately from the cervical line until the **junction of the cervical and middle thirds** forming the **buccal cervical ridge**. After that, this outline straightens until the mesiobuccal cusp tip.



Mandibular right 1st molar

Mesial aspect

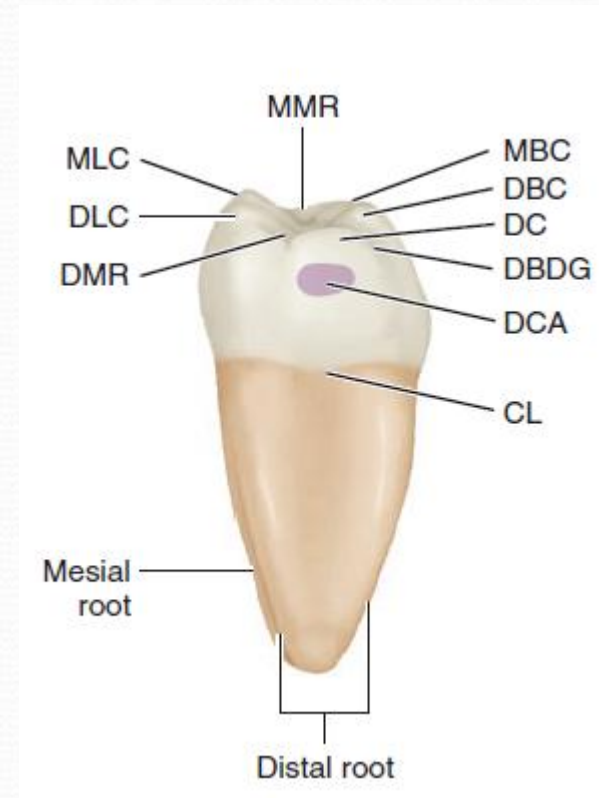
- The lingual outline of the crown is less convex, with the **crest of the curvature at the center of the middle third** of the crown.
- The marginal ridge is placed about 1 mm below the level of the mesiobuccal and mesiolingual cusp tips.
- The **buccal cusp is flat**, but the **lingual cusp is sharp with greater height**.
- The **cervical line** mesially is rather **irregular**, and it is at a higher level lingually than buccally, usually about 1 mm higher.



Mandibular right 1st molar

Distal aspect

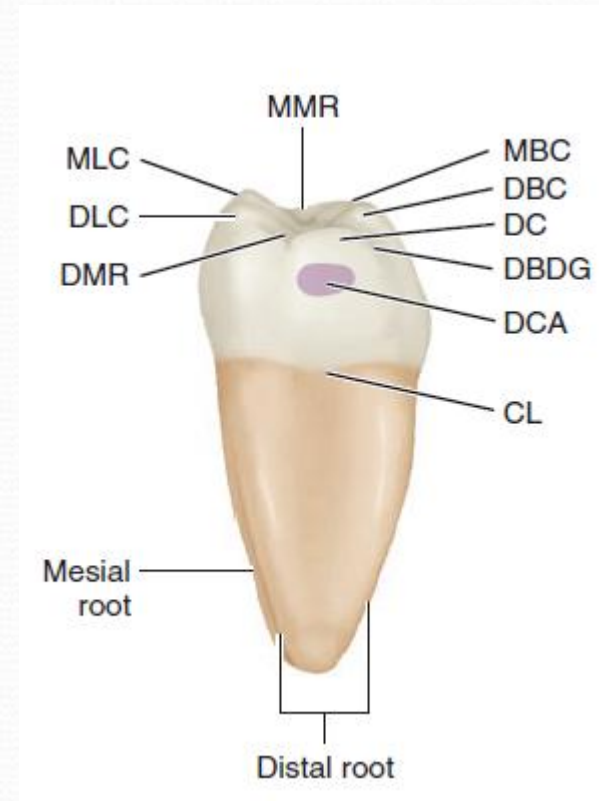
- The gross outline of the distal aspect (crown and root) is **similar** to that of the **mesial aspect, except**:
 - More of the **tooth and most of the occlusal surface can be seen** from the distal aspect, because the buccal and lingual surfaces of the crown converge distally and the crown is shorter distally than mesially.
 - The **distal root is narrower** than the mesial root bucco-lingually.



Mandibular right 1st molar

Distal aspect

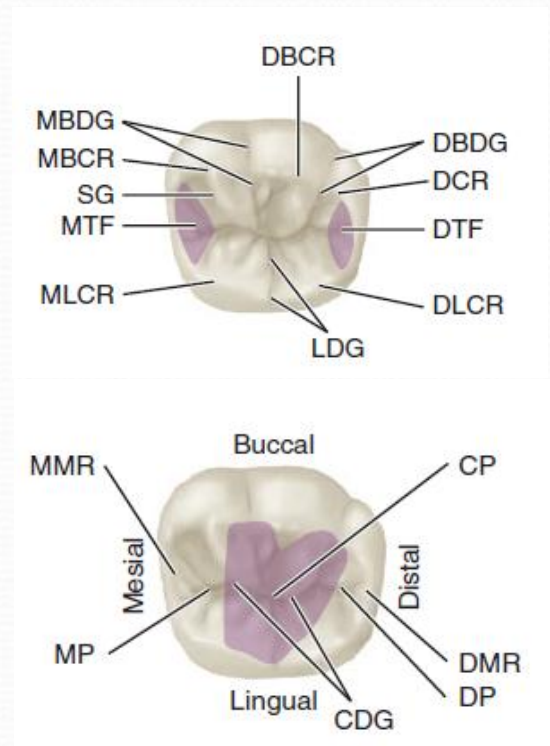
- The distal cusp is located a little buccal to the center of the crown buccolingually, with the **distal contact area** appearing on its distal contour.
- The **distal marginal ridge is short** and dips sharply in a cervical direction (obtuse angle).
- The **cervical line is irregular**.



Mandibular right 1st molar

Occlusal aspect

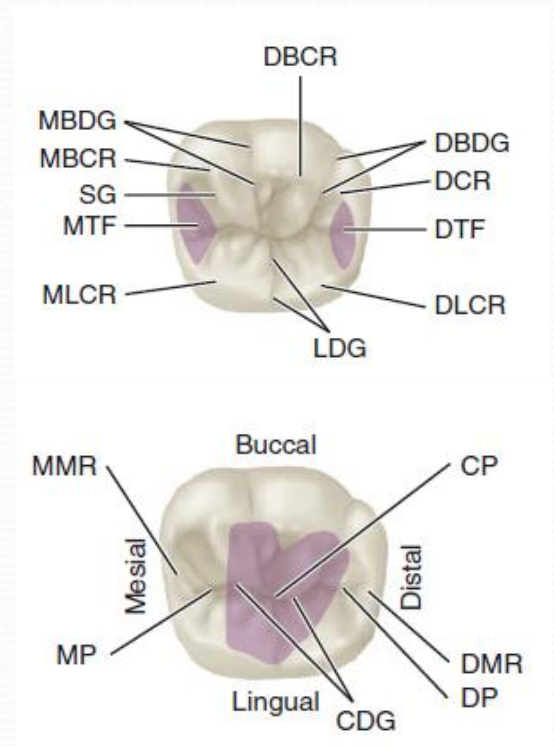
- The occlusal outline is **rectangular** in shape.
- The **bucco-lingual** measurement of the crown is **greater** on the **mesial** side **than** on the **distal** side. The **mesio-distal** measurement is **greater** on **buccal** side **than** on the **lingual** side.



Mandibular right 1st molar

Occlusal aspect

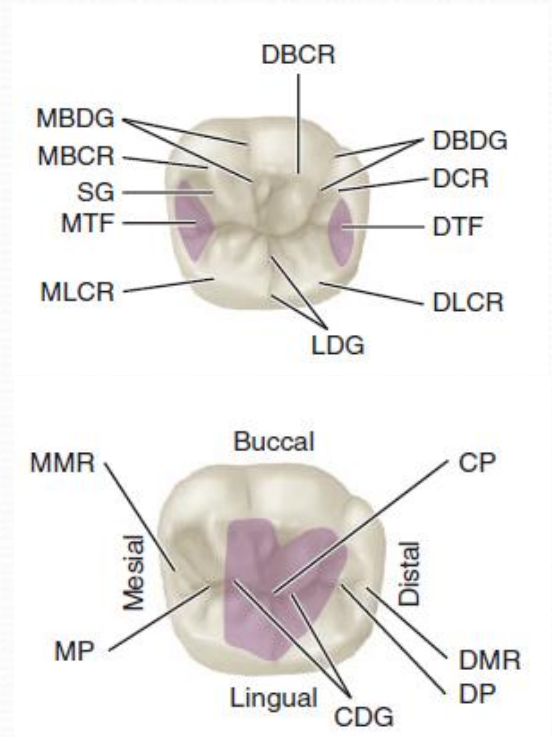
- It has five well-developed cusps. The MB cusp is the largest, then the ML, then the DL, then the DB, and then the smallest one is the D cusp.
- The distal contact area is located at the distal cusp.



Mandibular right 1st molar

Occlusal aspect

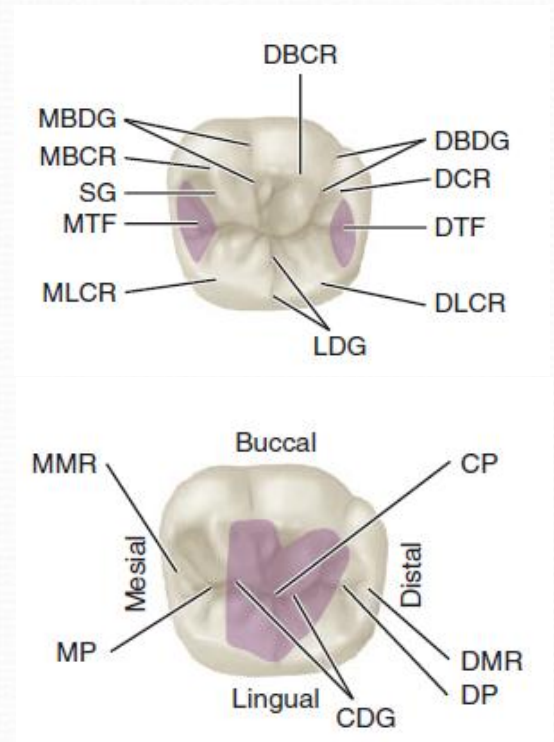
- The occlusal surface has **four** grooves.
 - The **central developmental groove** is not straight runs from the **central pit** in the **central fossa** to the **mesial and distal triangular pits**, at the **mesial and distal triangular fossae** respectively.
 - The **buccal (or mesiobuccal) developmental groove** runs from the **central pit** toward the buccal surface between the mesiobuccal and distobuccal cusps ending in the **buccal pit**, nearly centrally located cervico-occlusally.



Mandibular right 1st molar

Occlusal aspect

- The occlusal surface has **four** grooves.
 - The **distobuccal developmental groove** runs from its **junction with the central groove** in a distobuccal direction separating the distal and distobuccal cusps.
 - The **lingual developmental groove** is an irregular groove runs from the **central pit** toward the lingual surface between the mesiolingual and distolingual cusps.

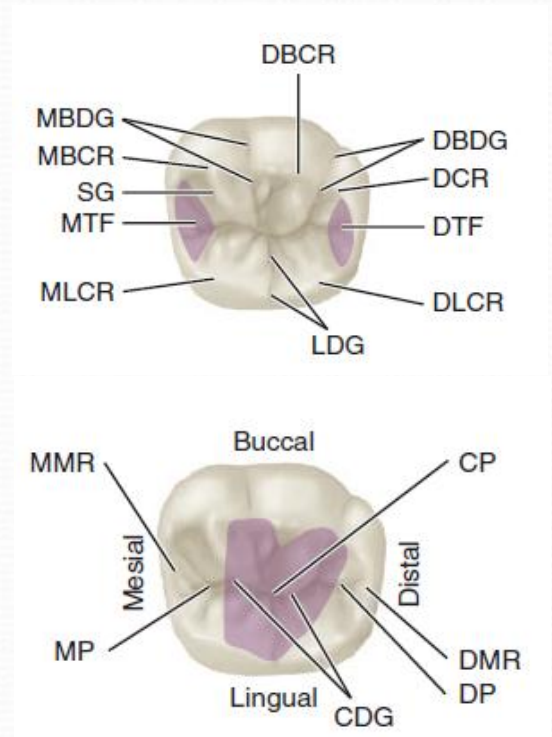


Mandibular right 1st molar

- Note: All of the developmental groove converge in the center of the central fossa at the central pit.

Occlusal aspect

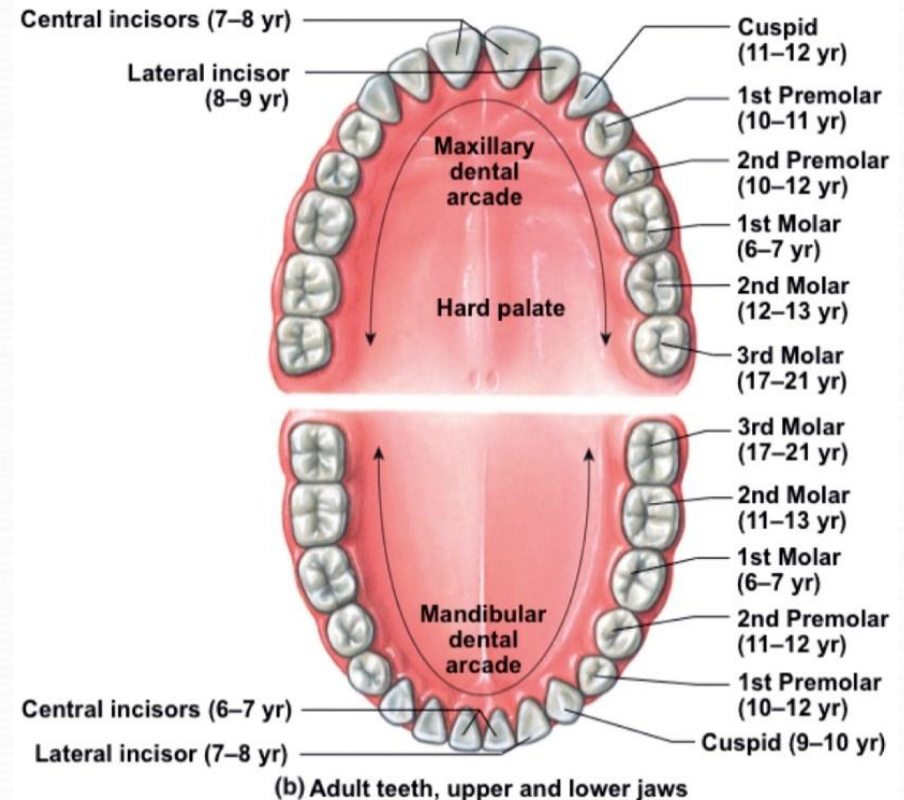
- The occlusal surface has **three** fossae.
- One major fossa.
 - The **central fossa** is concave area **roughly circular in shape**, and it is centrally located on the occlusal surface between buccal and lingual cusp ridges.
- Two minor fossae
 - the **mesial triangular fossa** is immediately distal to the mesial marginal ridge.
 - the **distal triangular fossa** is immediately mesial to the distal marginal ridge.



Mandibular right 1st molar

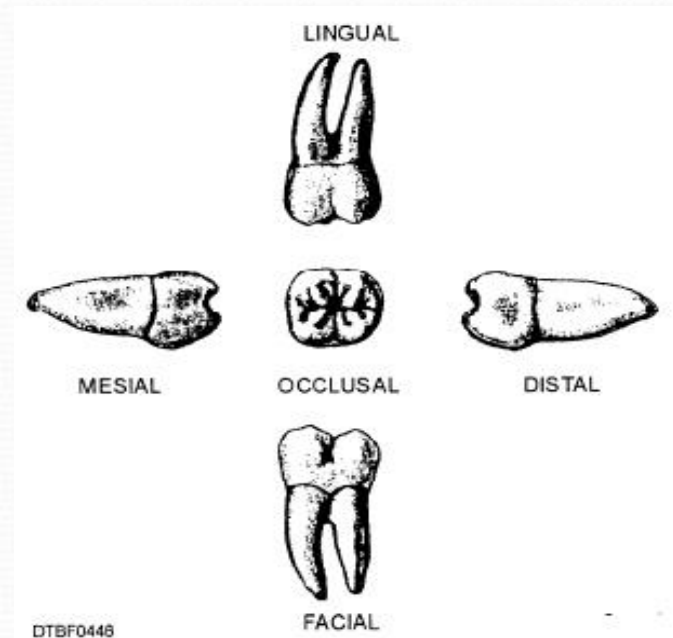
Permanent mandibular 2nd molar

- It **supplements the 1st molar in function**, have nearly **same general morphology**, but differ in the following:
 - It is **smaller** than 1st molar by fraction of millimeter in all dimension, but it is not uncommon to find 2nd molar larger than 1st molar.



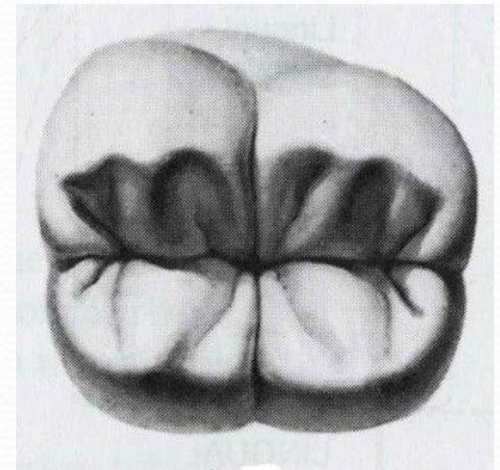
Permanent mandibular 2nd molar

- Although 2nd molar has two well developed roots (broad buccolingually), but they are not as broad as those of the first molar, nor are they as widely separated.
- **Buccally, only** one developmental groove present, **buccal groove**.



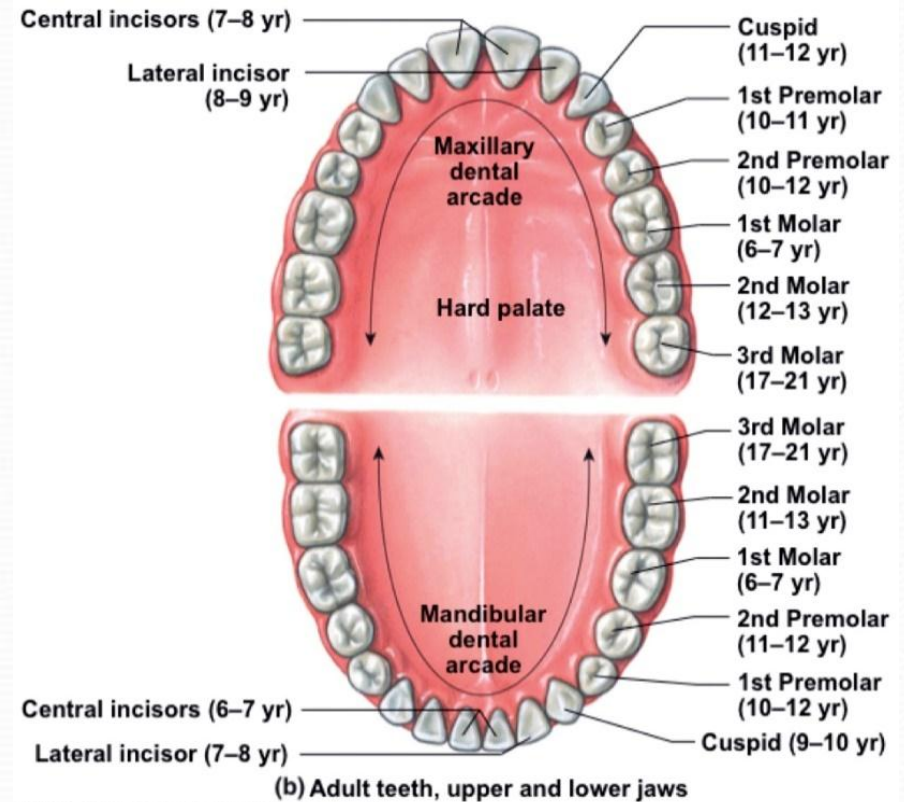
Permanent mandibular 2nd molar

- It has **only four well developed cusps** of nearly equal size, there is neither fifth cusp or distal cusp. DB developmental groove absent.
- Crown and root converge lingually to lesser degree than the 1st molar.
- Cervical ridge buccally is less pronounced than the 1st molar.
- **B & L developmental grooves** meet the **central developmental groove at right angles** at the **CP**, these grooves form a cross (**dividing occlusal surface into 4 nearly equal parts**).



Permanent mandibular 3rd molar

- The mandibular third molar varies considerably in different individuals and presents many anomalies both in form and in position.
- It supplements the 2nd molar in function, but it is seldom as well developed as the 2nd molar.

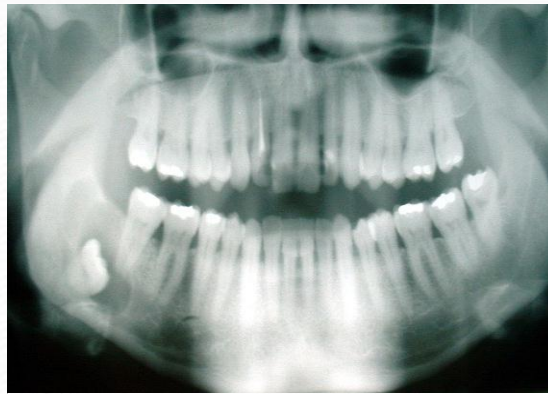


Permanent mandibular 3rd molar

- It usually shows irregular development of crown portion or roots (5 or more cusps could be found and under sized roots which are more or less malformed).
- Most of the mandibular third molars that are not normal in size are larger than normal, although it is possible to find dwarfed (small) specimens. In maxillary third molars, the opposite situation is likely, most of the anomalies are undersized.
- The roots are generally two in number, shorter in length and tend to be fused together. In many instances they show a distinct distal curve.

Permanent mandibular 3rd molar

- Mandibular thirds molars are **most likely to be impacted, partially or completely** within the jaw due to insufficient space for eruption. It may be **also horizontally** directed and **sometimes congenitally absent**.





Great Thanks