Anatomical terms of location (directional terms)

2.1 The directional terms

anterior = front, towards the front, forwards
apical = on, towards the apex (root tip), towards the root
approximal = on, towards the contact surface, towards the approximal (interdental) space
basal, basally = on, towards the (denture) base
buccal, buccally = on, towards the cheek, cheekwards
cervikal, cervically = on, towards the cervix (tooth neck), towards the cervix
distal, distally = away from the centre of the dental arch, away from the centre (towards the back of the dental arch)
dorsal, dorsally = towards the back
facial, facially = towards the face
frontal, frontally = towards the forehead
gingival, gingivally = towards the gingiva
incisal, incisally = towards the incisal edge
coronal, coronally = on, towards the tooth crown
labial, labially = towards the lip
lateral, laterally = towards the side, at/on the side
lingual, lingually = towards the tongue
mastical = towards the masticatory (occlusal) surface
marginal, marginally = towards the margin
mesial, mesially = towards the centre of the dental arch, towards the centre
occlusal, occlusally = refers to the masticatory surfaces of the posteriors
oral, orally = towards the mouth, within the dental arch
palatal, palatally = towards the palate
posterior, posteriorly = towards the back, backwards
sagittal, sagittally = from the front towards the back in the direction of the sagittal suture (connective tissue joint)
transversal, transversally = running across
vestibular, vestibularly = towards the vestibule, outside the dental arch
central, centrally = situated in the centre

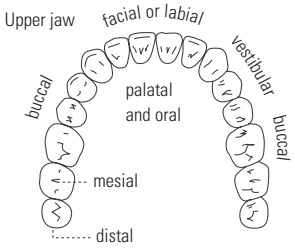


Fig. 1: Directional terms in the upper arch.

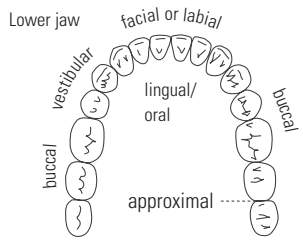


Fig. 2: Directional terms in the lower arch.

2.2 Angle's bite classification (Angle Classes)

Bite classification according to Angle is based on the mesiodistal positional relationship of the first molars.

According to this classification, anomalies with a neutral bite are also in Class I.

Anomalies with a distal bite belong to Class II (this has two subtypes: Class II Division 1 for cases with protruded upper anteriors, and Class II Division 2 for cases with retruded upper anteriors or deep bite).

All other anomalies belong to Angle Class III. This classification has some disadvantages, although it is the most frequently used and most widespread method of bite classification.

Angle Class I occlusion (Normal occlusion or neutral occlusion)

The distobuccal cusp of the first lower molar is situated in the central fossa of the first upper molar.

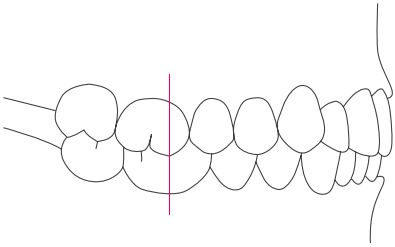


Fig. 2: Angle Class I occlusion.

Angle Class II occlusion (distal occlusion)

The first lower molar is positioned too far distally in relation to the first upper molar.

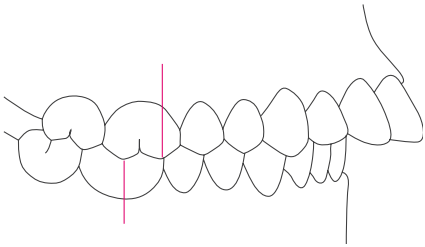


Fig. 3: Angle Class II/1 occlusion.

Angle Class II/1 occlusion (syndrome: distal bite)

Distal occlusion with protruded upper anteriors, mostly featuring mandibular retrusion with a narrow maxilla, a high palate, a deep bite and an enlarged sagittal (horizontal) overbite.

Angle Class II/2 occlusion (syndrome: covering bite)

Distal occlusion with steeply sloping upper anteriors (the lateral incisors often overlap the central incisors from an anterior), perspective mostly featuring a retruded mandibular position with a wide, box-shaped maxilla and a deep bite.

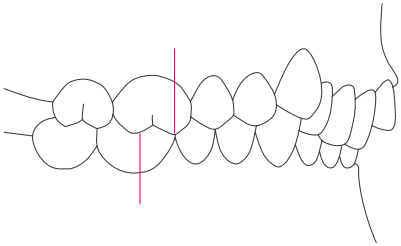


Fig. 4: Angle Class II/2 occlusion.

Angle Class III occlusion (mesial occlusion)

The first lower molar is positioned too far mesially in relation to the first upper molar.

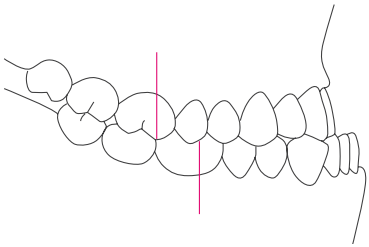


Fig. 5: Angle Class III occlusion.

Angle Class III occlusion (syndrome: progenia)
Mesial occlusion with an inverted anterior overbite (often with protruded upper anteriors and retruded lower anteriors by way of compensation); mostly accompanied by a crossbite in the posterior area, a large chin and a shallow mentolabial fold.

2.3 Types of bite

2.3.1 Normal occlusion

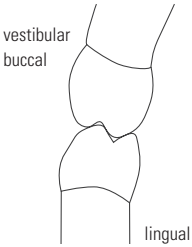


Fig. 6: Normal occlusion.

When the palatal cusps (working cusp) of the maxillary teeth bite into the fossae of the mandibular teeth, this is said to be in „normal occlusion“ (Fig. 6).

2.3.2 Edge-to-edge-bite

When the cusps of the mandibular teeth bite onto those of the maxillary teeth, this is referred to as an edge-to-edge bite (Fig. 7).

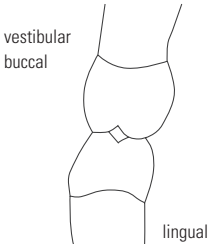


Fig. 7: Edge-to-edge bite.

2.3.3 Crossbite

When the buccal cusps of the lower posteriors protrude vestibularly beyond those of the upper jaw, this is said to be a crossbite (Fig. 8).

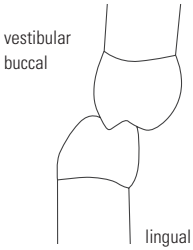


Fig. 8: Crossbite.

2.3.4 Scissor bite

When the palatal cusps of the upper jaw extend beyond the buccal cusps of the lower jaw vestibularly, this is referred to as a scissor bite (Fig. 9).

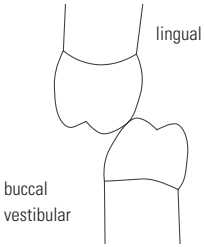


Fig. 9: Scissors bite.

2.4 Human dentition

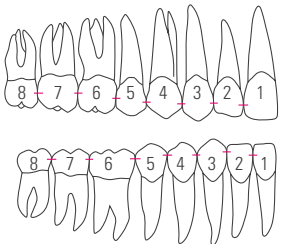


Fig. 10: The names of the teeth.

2.4.1 Anterior teeth

Central incisors (centrals) (1)	=	the middle incisor (cutting) teeth (1)
Lateral incisors (laterals) (2)	=	the lateral incisor (cutting) teeth (2)
Canines (3)	=	the canine teeth (corner teeth) (3)

(also called cuspids or eye teeth).

2.4.2 Posterior teeth

First premolars (4)	=	the first posterior teeth (4)
Second premolars (5)	=	the second posterior teeth (5)
First molars (6)	=	the first chewing teeth (6)
Second molars (7)	=	the second chewing teeth (7)
Third molars (8)	=	the third chewing teeth (8)

(also referred to as wisdom teeth).

2.5 Classification of cusps

2.5.1 Working cusps

The working cusps in the upper are the palatal cusps, and in the lower the buccal cusps. These are also called shearing, centric or supporting cusps.

2.5.2 Shearing (non-working) cusps

The shearing cusps in the upper are the buccal cusps, and in the lower, the lingual cusps. They are responsible for the shearing of food. The shearing cusps are also referred to as balancing cusps or non-working cusps.

2.6 FDI tooth notation system

The following two-digit system (FDI tooth notation) for the classification of the individual teeth has become established internationally. The first digit denotes the corresponding quadrant, 1 – 4 in permanent, or 5 – 8 in deciduous dentition (upper right = 1, upper left = 2, lower left = 3, lower right = 4), and the second digit is the number referring to the position of each tooth in the respective quadrant (cf. Fig. 10):

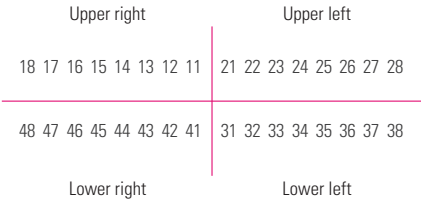


Fig. 11: FDI tooth notation.

2.6.1 Zsigmondy system of tooth notation

The system suggested by Zsigmondy, in which every tooth is numbered consecutively from the central incisor (1) to the third molar (8), is based on the Zsigmondy cross to record quadrants of tooth positions. The respective teeth are entered in the corresponding quadrants, with the following result:

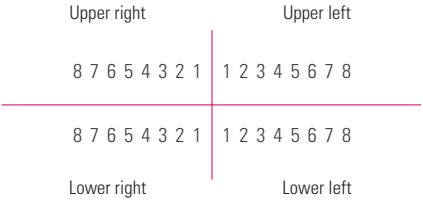


Fig. 12: Zsigmondy tooth notation.

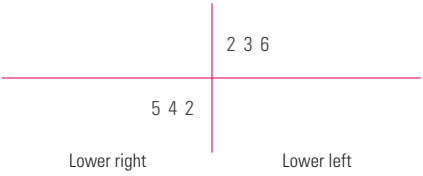


Fig. 13: Notation according to a Zsigmondy cross.

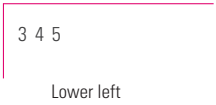


Fig. 14: If only one quadrant is affected, only the angle representing the corresponding quadrant is depicted.

Note:

The left-hand side of the patient is the right-hand side from the dentist's point of view. The right-hand side of the patient is the left-hand side from the dentist's point of view.

The diagrams of the respective tooth nomenclature systems are based on the dentist's point of view.

2.6.2 Haderup system of tooth notation

The tooth notation according to Haderup describes the teeth in the upper with a plus sign (+) on the mesial side, i.e. the upper left canine, for instance, would be +3, and the upper right canine 3+.

In the lower a minus sign (-) is used instead of a plus sign on the mesial side. This means that -4 denotes the first lower left premolar, and 4– the first lower right premolar.

When referring to deciduous teeth, a zero (0) is placed in front of the digit referring to the tooth.

2.7 Planes and lines of reference

Definitions

2.7.1 Frankfort horizontal plane (1):

A craniometrical reference plane established by the lowest point on the margin of the right or left bony orbit and the highest point in the margin of the left or right auditory meatus.

2.7.2 Camper's line (2):

An imagined plane through both tragus points and the spina nasalis anterior (anterior nasal spine). This runs parallel to the occlusal plane and forms an angle of 15 – 20 ° to the Frankfort horizontal plane.

2.7.3 Occlusal plane (3):

This is represented by the following three points on the dentulous anch:

- the contact point of the incisal edges of the lower central incisors (incisal point),
- the tips of the distobuccal cusps of the second lower molars.

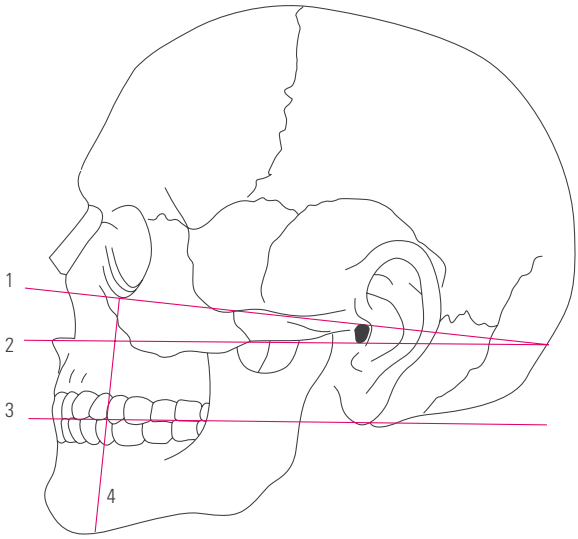
This is mostly situated at the height of the lip closure line.

2.7.4 Simon's orbital plane (4):

Plane running through the orbit at right angles to the Frankfort horizontal plane; is used for determining sagittal variations.

2.7.5 Median plane:

Divides the body into left and right halves.



1. Frankfort horizontal plane
2. Camper's plane
3. Occlusal plane
4. Simon's orbital plane

Fig. 15: Planes and lines of reference relating to the human skull.

2.8 Curves of occlusion

2.8.1 Curve of Spee (sagittal compensation curve)

The curve of Spree has an arch-shaped progression in the sagittal direction (sagittal occlusion or compensation curve).

The imagined centre of the circle is situated in the orbit. The radius is approx. 7 cm, and under ideal conditions touches the anterior surface of the condyle. This system is used in complete denture prosthetics under the assumption that 1. The condyle is situated on the same circular path as the posteriors, and 2. The posteriors remain in constant contact during protrusive movement.

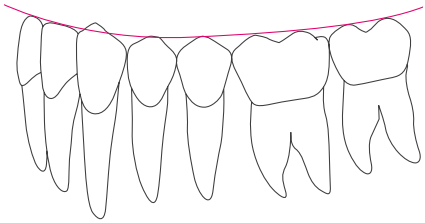


Fig. 16: Curve of Spee.

2.8.2 Curve of Wilson (transversal compensation curve)

The curve of Wilson is represented by a line connecting the cusps of the lower posteriors in the transversal direction. Its progression is determined by the fact that the lingual cusps are situated at a lower height than the buccal cusps.

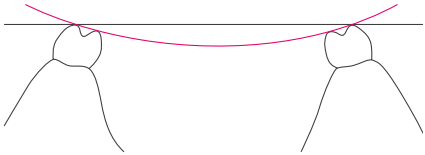


Fig. 17: Curve of Wilson.

2.8.3 Curve of Monson

The curve of Monson is based on the curve of Spee in the sagittal direction and the curve of Wilson in the transversal direction. This gives rise to a 3-dimensional spherical curvature (sphere of Monson), a spherical surface on which the posterior teeth are arranged.

Notes