

Anatomical terms of location (directional terms)

The complete denture prosthesis according  
to qualitative considerations

Patients Dental / Medical History

Preparatory working steps

Articulators and articulation theories

Model analysis

### 1.1 The anterior teeth

Human dentition consists of twelve anterior teeth (incisors), six lower and six upper. The function of the anterior teeth is to bite off food. These teeth are relatively sharp, and are situated in the anterior.



Fig.1

### 1.2 The posterior teeth

The posterior teeth are also referred to as chewing teeth or back teeth. These are categorized into large and small posterior teeth, termed respectively molars and premolars. The large molars, or back teeth, are the largest teeth of



Fig. 2

human dentition. The premolars, i.e. the more frontal chewing teeth or small back teeth, are situated in front of the molars in the permanent human dentition.

### 1.3 The maxilla

The upper (maxilla) is a craniofacial bone. It forms the floor of the eye sockets (orbits), the floor and the side wall of the nasal cavity (cavum nasi) as well as a part of the palate, and hence the roof of the oral cavity (cavum oris proprium).

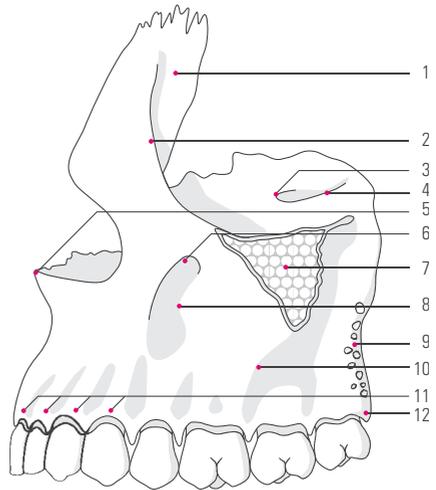


Fig. 3: Topographical details of the interior of the maxilla

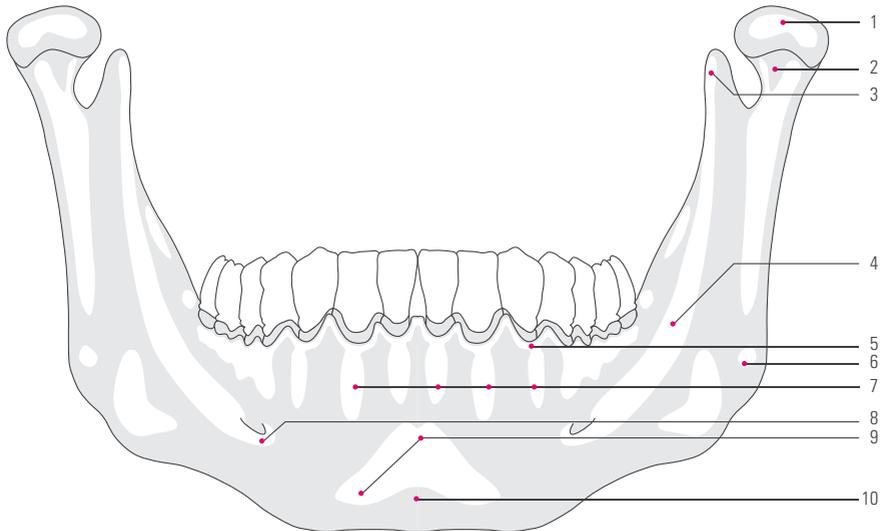
1. Frontal process of the maxilla (processus frontalis)
2. Anterior lacrimal crest (crista lacrimalis anterior)
3. Infraorbital canal (canalis infraorbitalis)
4. Infraorbital groove (or sulcus) (sulcus infraorbitalis)
5. Anterior nasal spine (spina nasalis anterior)
6. Infraorbital foramen (foramen infraorbitale)
7. Zygomatic process (processus zygomaticus)
8. Canine fossa (fossa canina)
9. Alveolar foramina (foramina alveolaria)
10. Infrazygomatic crest (crista infrazygomatica)
11. Alveolar juga (juga alveolaria)
12. Maxillary tubers (tuber maxillae)

The maxilla also contains the maxillary sinus cavity.

## 1.4 The mandible

The mandible consists of the horseshoe-shaped body of the lower arch (mandibular corpus), and the upwardly sloping mandibular ramus (ramus mandibulae) on either side. On these upward sloping rami, a coronoid process is situated at

the temporal muscle insertion. Likewise situated on both sides of the rising mandibular rami is the condylar process with the mandibular head (caput mandibulae).

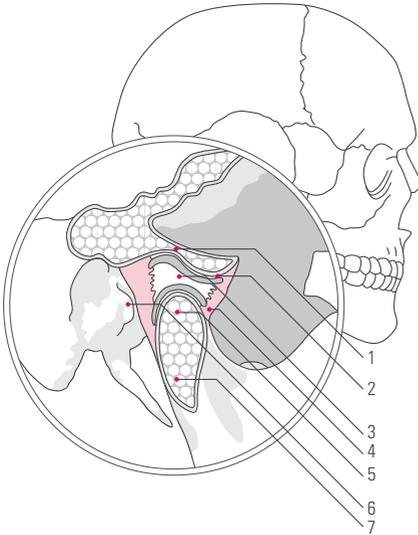


**Fig. 4:** Labial view of the mandible.

1. Mandibular head (caput mandibulae)
2. Mandibular collum (collum mandibulae)
3. Coronoid process (processus coronoideus)
4. Mandibular oblique line (linea obliqua mandibulae)
5. Alveolar limbus (limbus alveolaris)
6. Tuberosities of the masseter (tuberositates massetericae)
7. Alveolar juga (juga alveolaria)
8. Mental foramen (foramen mentale)
9. Mental tubercle (tuberculum mentale)
10. Mental trigonum (trigonum mentale)

## 1.5 The temporomandibular joint

The temporomandibular joint is situated directly in front of the outer ear canal (external auditory meatus). A distinction is made between the osseous and the fibrous part of the joint. This is a rotating and sliding joint, which conveys the movement of the mandible in relation to the maxilla. The articu-



**Fig. 5:** Detailed view of the temporomandibular joint.

1. Mandibular fossa (fossa mandibulae)
2. Articular tubercle (tuberculum articulare)
3. Articular disc (discus articularis)
4. Articular capsule (capsula articularis)
5. Condyle/mandibular head (condylus/caput mandibulae)
6. Retroarticular process/tympanic tubercle (processus retroarticularis/tuberculum tympanicum)
7. Mandibular collum (collum mandibulae)

lating surfaces consist of the mandibular fossa (fossa mandibularis) and the mandibular head (caput mandibulae), which is located on the condylar process (processus condylaris) of the mandible. The mandibular fossa is situated directly in the squamous part of the temporal bone (squama temporalis) and contains the articular tuber-

cle (tuberculum articulare). With its posterior, downwards slanted surface, the articular tubercle takes on the guidance of the mandibular condyle during the opening movement, and thus determines the condylar path.

The articular surfaces are coated with fibrocartilage. The articular disc (discus articularis) is located between the joint surfaces as a pressure distributor consisting of the same substance. It divides the articular capsule into an upper and lower joint compartment. The articular cavity contains the viscous, joint-lubricating (synovial) fluid, and is enveloped by the articular capsule (synovial membrane); definition from Hoffmann-Axthelm's „Lexikon der Zahnmedizin“ (a standard dictionary of dental practice in Germany).

## 1.6 The tongue

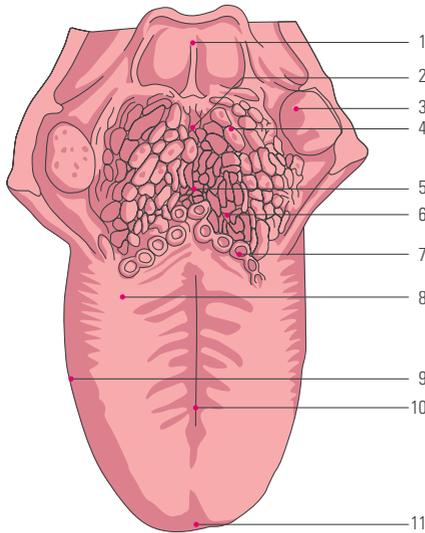
The tongue is a mucous membrane-enveloped, highly mobile muscular organ, on which taste and tactile nerves are located. It is an important organ for food uptake during the process of mastication, for sucking and for the swallowing movements.

The tongue has great importance also for the speech function, which is described in more detail in the section on phonetics (Section 10.3).

The oral cavity is almost completely filled out by the tongue (take care when designing the denture base!).

The lingual frenulum is situated on the underside of the tongue. This is subject to a great deal of movement by the chewing, swallowing and speech functions.

For this reason, the frenulum must not be confined by a peripheral margin, and sufficient free space must be left in the corresponding areas.



**Fig. 6:** Differentiated structure of the dorsum of the tongue.

1. Epiglottis
2. Tongue root (radix linguae)
3. Palatal tonsils (tonsilla palatina)
4. Lingual tonsils (tonsilla lingualis)
5. Lingual foramen caecum (foramen caecum linguae)
6. Terminal sulcus (sulcus terminalis)
7. Vallate papilla (papilla vallatae)
8. Lingual dorsum (dorsum linguae)
9. Lingual margin (margo linguae)
10. Medial lingual sulcus (sulcus medianus linguae)
11. Lingual apex (apex linguae)

In addition to the nerve ends responsible for the sense of, also different types of papillae by means of which the four different taste characteristics (sweet, sour, salty and bitter) can all be perceived, are located on the underside of the tongue.

## 1.7 The musculature

In the section entitled „Musculature“ (section 1.7), explanation is given only for the most elementary muscles involved in the opening and closing of the mouth and the wearing of complete dentures; further information can be found in the corresponding literature.

### Mouth-closing muscles

The important muscles with regard to the movement of the mandible can be classified into the mouth-closing and mouth-opening muscles.

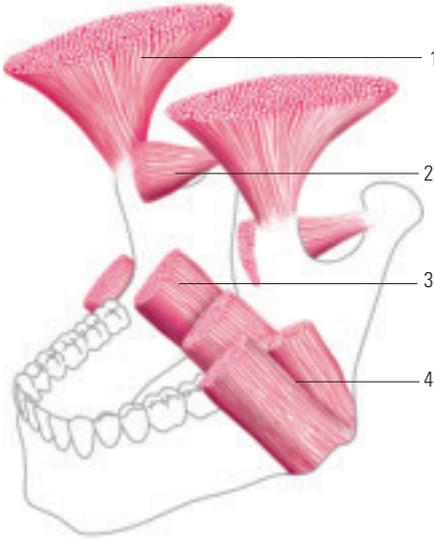
The masseter muscle is a strong jaw-closing muscle in the main direction of its fibres. By means of its slanted fibres, it supports protrusion and mediotrusion movements.

Due to its wide, fan like structure, the temporal muscle can operate in different directions of force. The main directions are upwards, dorsally and somewhat anteriorly.

### Mouth-closing and mouth-opening muscles

The medial pterygoid muscle, due to its identical direction of operation, pulls in the same direction as the masseter muscle. This can support both mediotrusion and protrusion movements.

The lateral pterygoid muscle has two heads of muscle. During a closing movement, the upper head is active. The shortening of the lower head causes the protrusion and / or laterotrusion movement of the mandible.



**Fig. 7:** Musculature pertaining to the mandibular movements.  
 1. Temporal muscle (musculus temporalis)  
 2. Lateral pterygoid muscle (musculus pterygoideus lateralis)  
 3. Medial pterygoid muscle (musculus pterygoideus medialis)  
 4. Masseter muscle (musculus masseter)

### Muscles of the floor of the mouth

The muscles of the floor of the mouth comprise the mylohyoid and geniohyoid muscles.

The mylohyoid muscle is involved in the opening of the mouth, firmly holds the hyoid bone, and is responsible for raising the floor of the mouth during the act of swallowing. During this time, the tongue is able to seal off the oral cavity against the palate.

The geniohyoid muscle is also involved in the process of opening the mouth. It furthermore lifts and holds the hyoid bone in position.

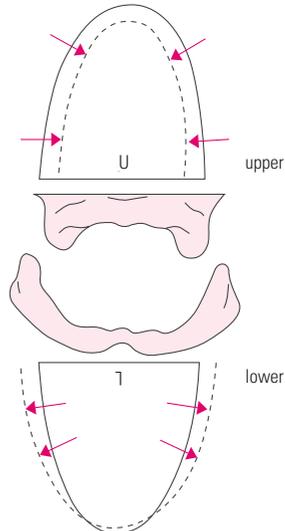
### Cheek musculature/mouth-closing muscles

The buccinator muscle is certainly an important muscle with regard to a dental prosthesis. Through the application of pressure to the cheek, it serves to empty the vestibular area of the mouth.

The orbicularis oris muscle is the mouth-closing sphincter muscle that encircles the mouth.

### 1.8 Bone and arch atrophy

In both the upper and the lower arch, the bone atrophies following the extraction of teeth. The upper arch atrophies centripetally (inwardly), the lower centrifugally (outwardly). This not seldom leads to problems of denture stability, which can be overcome by consistent implementation of the concept chosen for the particular case.



**Fig. 8:** Diagram showing the course of arch atrophy.

