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Clinical update: Dental Services

Tooth Anatomy

Knowledge of the anatomy of teeth is important in the understanding of both the disease processes and interventions required for the treatment of dental diseases (see Figure 1).

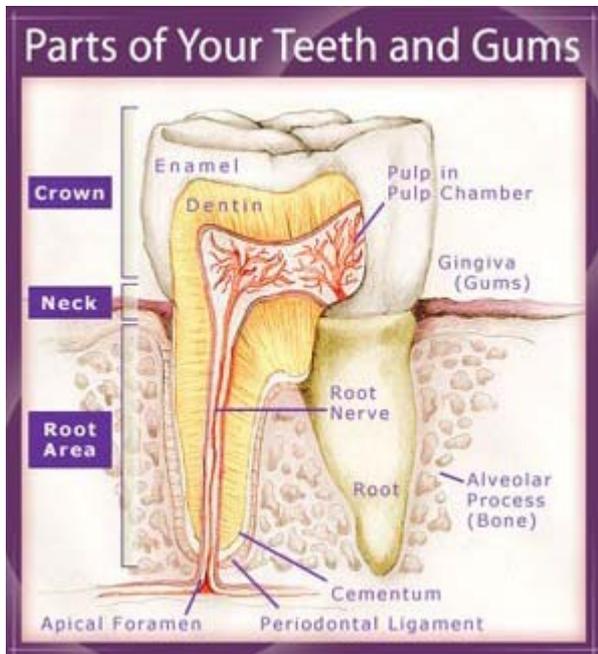


Figure 1 - Tooth anatomy

Definitions

<i>Enamel</i>	The tough, shiny, white outer surface of the tooth.
<i>Dentin</i>	The hard but porous tissue located under both the enamel and cementum of the tooth. Dentin is harder than bone.
<i>Cementum</i>	The layer of tough, yellowish, bone-like tissue that covers the root of a tooth. It helps hold the tooth in the socket. The cementum contains the periodontal membrane.
<i>Crown</i>	The visible part of a tooth.
<i>Tooth root</i>	The portion of the tooth that lies beneath the gum line and is embedded in bone. The tooth root serves as an anchor to hold the tooth in position.
<i>Pulp</i>	The soft inner structure of a tooth consisting of nerve and blood vessels.
<i>Gingiva</i>	The gum.
<i>Deciduous teeth</i>	The primary or baby teeth; the first set of teeth that are later replaced by permanent teeth.
<i>Exfoliation</i>	The process by which the deciduous teeth fall out to make way for the eruption of permanent teeth.
<i>Eruption</i>	The process by which the teeth break through the gums.

Types and Position of Teeth

- Anterior** The teeth in front of the mouth eg centrals, laterals and cuspids.
- Posterior** The teeth at the back of the mouth including molars and bicuspid.
- Incisors** The four front teeth in the lower and upper jaw are called incisors. The central pair in the lower and upper jaw are called central incisors and the teeth on either side of the central incisors are called lateral incisors. These teeth are broad and flat with a narrow edge that is used for cutting or snipping off pieces of food.
- Canines** The four canine teeth are situated next to the lateral incisors on the lower and upper jaw. They are also referred to as eyeteeth or cuspids. Canines are the longest and most stable teeth in the mouth. They are used to rip and tear food and have a single long root.
- Premolars** Next to each of the canine teeth are two premolars, also referred to as bicuspid. These teeth are a cross between canines and molars. Like the canine teeth, premolars have sharp points for ripping; however, they also have a broad surface, like molars, for chewing and grinding.
- Molars** The last three teeth on both sides of the mouth, in the upper and lower jaw. They are numbered first, second or third molar according to their location. The third molars are also referred to as wisdom teeth. Wisdom teeth are the last teeth in the mouth and are the last teeth to erupt. Molars are the largest teeth in the mouth. They have a broad surface that is used for crushing, grinding and chewing food.

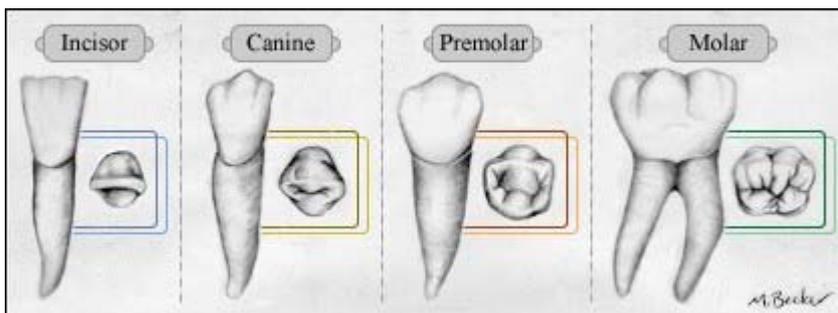


Figure 2 - Types of Teeth

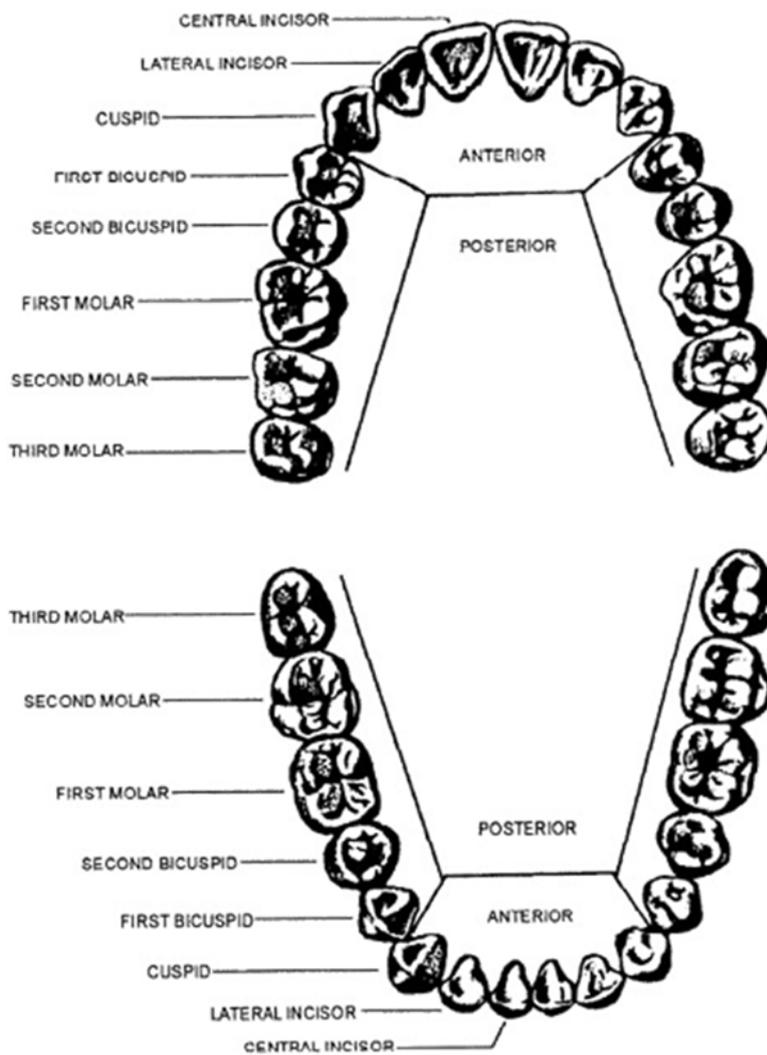


Figure 3 - Names of Anterior and Posterior Teeth

Dental Notation (Dental Numbering) Systems

Tooth notation, or numbering, systems are used by dentists to associate information to a specific tooth. These notation systems are used in medical records and operation reports to help to identify which specific tooth is being treated. Two common tooth numbering systems used in Australia are the Federation Dentaire Internationale (FDI) Two Digit Notation method and the Palmer notation method.

FDI Two Digit Notation Method

This notation method is a combination of two numbers. The first number indicates the tooth's location (upper left or right, lower left or right) and the second number indicates the specific tooth (see Table 1).

Table 1 - Quadrant Codes

Adult Teeth	Deciduous Teeth
1 - upper right	5 - upper right
2 - upper left	6 - upper left
3 - lower left	7 - lower left
4 - lower right	8 - lower right

Each quadrant contains eight teeth. The teeth are assigned a number from 1 to 8 starting at the central incisor (1) and working toward the 3rd molar (8) (see Table 2).

Table 2 - Tooth Codes

- 1 - central incisor
- 2 - lateral incisor
- 3 - canines
- 4 - 1st premolar
- 5 - 2nd premolar
- 6 - 1st molar
- 7 - 2nd molar
- 8 - 3rd molar

The combination of these two numbers make up the FDI two digit notation number (see Figure 4).

Permanent Teeth															
Upper Right								Upper Left							
18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
Lower Right								Lower Left							

Primary teeth										
Upper Right					Upper Left					
55	54	53	52	51	61	62	63	64	65	
85	84	83	82	81	71	72	73	74	75	
Lower Right					Lower Left					

Figure 4 - FDI Tooth Notation Method for Permanent and Deciduous Teeth

Palmer Notation Method

Permanent Teeth

In this method the teeth are also divided into quadrants and are numbered from 1 to 8 in the same manner as the FDI notation method. However, the method of identifying the specific quadrant is different. Each quadrant is identified by an L shaped symbol. The number of the tooth then sits inside the L shaped symbol, with the upper and lower quadrants identified by whether the shape is right side up or upside down as follows (see Figure 5 and Example 1):

- ┘ - upper right quadrant
- └ - upper left quadrant
- ┙ - lower right quadrant
- ┚ - lower left quadrant

Upper right	8┘ 7┘ 6┘ 5┘ 4┘ 3┘ 2┘ 1┘	└1 └2 └3 └4 └5 └6 └7 └8	upper left
Lower right	8┙ 7┙ 6┙ 5┙ 4┙ 3┙ 2┙ 1┙	┘1 ┘2 ┘3 ┘4 ┘5 ┘6 ┘7 ┘8	lower left

Figure 5 - Palmer Notation Method for Permanent Teeth

Example 1

4

Using the Palmer notation, this symbol identifies an upper-right first premolar tooth.

Deciduous Teeth

The Palmer notation method has a different method for numbering deciduous teeth. The teeth are identified by the letters A to E. The teeth are assigned a letter starting at the central incisor (A) and working toward the 3rd molar (E). The system for the identification of the tooth's position is exactly the same as for permanent teeth (see Figure 6 and Example 2).

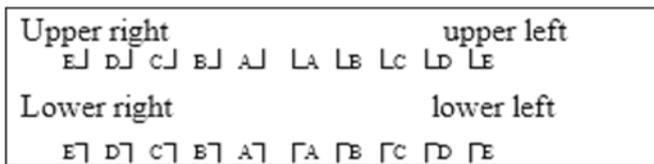


Figure 6 - Palmer Notation Method for Deciduous Teeth

Example 2

A

Using the Palmer notation method, this symbol identifies a deciduous lower-right central incisor tooth.

Tooth Surfaces

There are five possible tooth surfaces that can be restored: buccal, distal, lingual, mesial, and occlusal/incisal (see Figure 7).

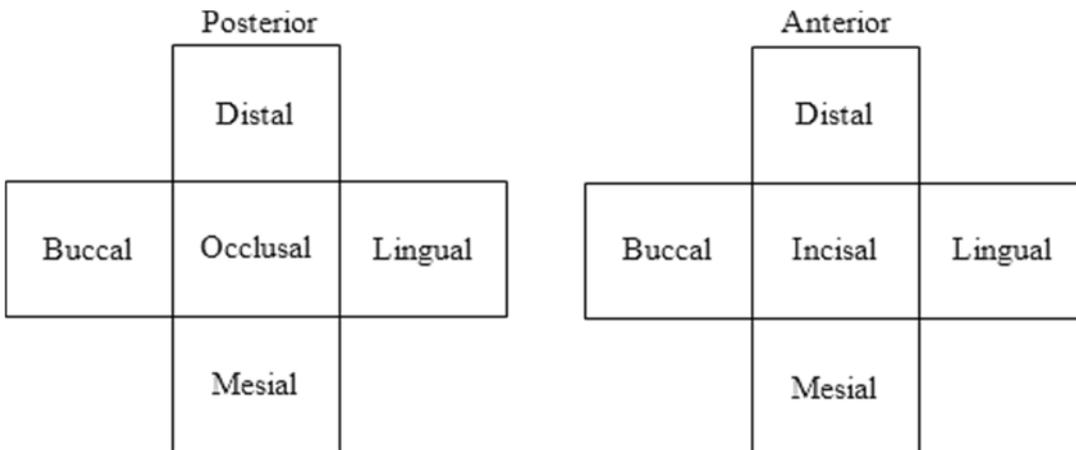


Figure 7 - Tooth Surfaces for Anterior and Posterior Teeth

- Buccal** The surface of the tooth that faces toward the cheek.
- Distal** The proximal surface that is orientated away from the midline of the dental arch. It is the opposite of mesial.
- Lingual** The tooth surface next to the tongue.
- Mesial** The proximal surface that is closest to the midline of the dental arch.
- Occlusal** The surface of the tooth that has contact with the opposing tooth.
- Incisal** The surface of the tooth that has contact with the opposing anterior teeth. It refers to the cutting edge of an incisor or canine tooth.
- Dental arch** The curved structure that is formed by the teeth in their normal position.

Dental Restorations

Dental restorations or fillings are used to restore function and integrity to the structure of teeth. The most common causes for the loss of tooth structure are dental caries or tooth trauma.

Dental restorations are classified into two types, direct and indirect (see Table 3).

Direct restorations are performed by placing the restorative material directly onto the tooth. These types of restorations are usually performed in one visit and examples include dental amalgam, glass ionomers, resin ionomers and resin composite fillings.

Indirect restorations involve materials that have been fabricated outside the mouth. Examples include inlays, onlays, veneers, crowns and bridges.

Table 3 - Restorative Material

	Direct	Indirect
Adhesive or tooth-coloured	compomer composite resin (eg CR, Z100, AECR) glass ionomer (Ketac, Photac, GIC, Dyract) polymer glass porcelain/ceramic acrylic	
Metallic	Amalgam (mercury based alloy) Galloy (gallium based alloy) gold foil	chrome cobalt gold non precious metal

Removal of Teeth

Non-surgical extraction

Also referred to as simple extraction is generally performed under local anaesthetic and is performed on teeth that can be seen in the mouth. The tooth is held with forceps which are then moved back and forth to loosen the tooth until it is removed. Sometimes a luxator is used to help loosen the tooth before it is extracted.

Surgical extraction

An incision is made into the mucosa and a mucoperiostial flap is raised in order to extract the tooth. In some cases, the tooth will need to be broken into sections to be removed. Surgical extractions may involve teeth that are not visible in the mouth either because the tooth has broken off or has not yet erupted through the gum. Surgical extractions are also performed if a tooth is impacted.

Tooth impaction

Occurs when a tooth fails to erupt through the gum (or only partially erupts) at the expected time. Wisdom teeth, the last teeth to erupt, are the most common teeth to become impacted.

There are four types of tooth impaction - erupted (already in the mouth), full bony impaction (see Figure 8), partial-bony (see Figure 9) and soft tissue impaction (see Figure 10). An impacted tooth may be painless, however, pain and swelling occurs when the tooth tries to erupt through the overlying gum. Pain may be felt in nearby teeth or the ear on that side. A partially erupted tooth may collect food and debris leading to gum swelling and pericoronitis.

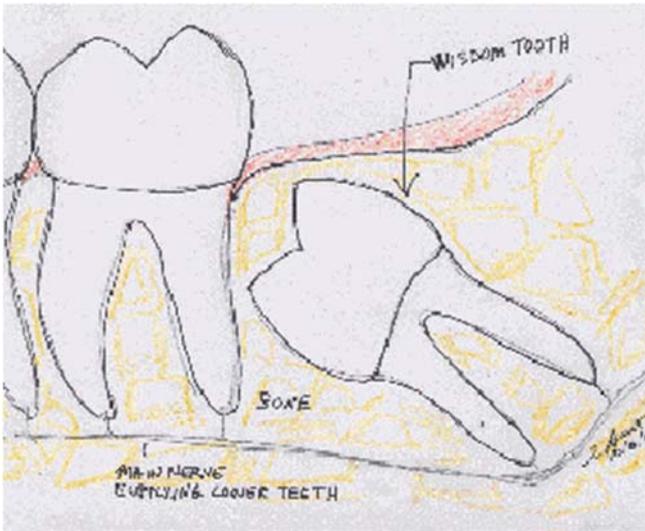


Figure 8 - Full Bony Impaction

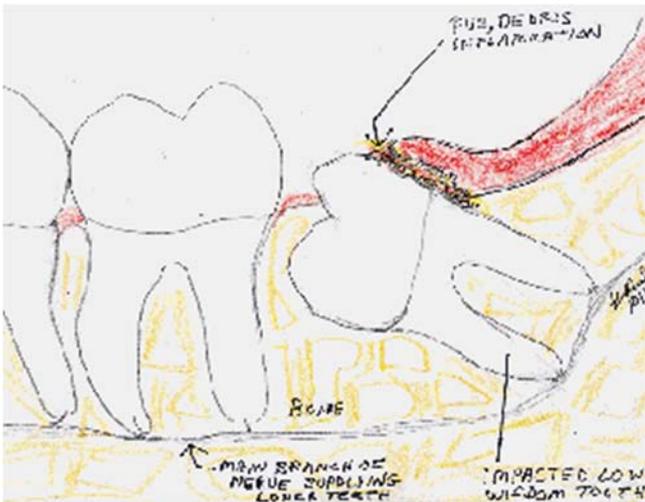


Figure 9 - Partial Bony Impaction



Figure 10 - Soft Tissue Impaction

Removal of impacted teeth

The procedure for the removal of wisdom teeth varies according to the type of impaction. Wisdom teeth may grow in different directions due to lack of space in the jaw. As a result, the complexity of the surgery depends on the type of impaction. If the tooth has erupted fully it may be removed by a simple extraction. However, a full bony impaction will require a complex surgical extraction.

Impacted wisdom teeth are generally removed by surgical extraction. An incision is made into the gum and the gum tissue is moved out of the way. This exposes the tooth and the bone overlying it. In order to access the tooth, any bone in the way needs to be carefully removed. Once the tooth is exposed, it may need to be broken into pieces or sectioned in order to be removed. Sectioning the tooth enables the tooth to be removed through the smallest possible incision, with the loss of the least amount of bone. Sectioning the tooth also protects important nerves and blood vessels that surround the tooth. Once the tooth has been removed the gum tissue is replaced and the wound is sutured.

Dental Procedures and Definitions

The following tables list the types of dental interventions that may be performed.

Preventative Dental Services

Procedure/Terms	Definition
Removal of plaque or stain	Removal of dental plaque and/or stains from the surfaces of all teeth.
Fissure sealing and/or tooth surface sealing	Sealing of non-carious pits, fissures or cracks in a tooth with an adhesive material to prevent development of dental caries at the site.
Odontoplasty	Modification of the contour of the crown of a tooth or the anatomy of the fissure of a tooth.

Periodontic Interventions

Procedure/Terms	Definition
Root planing with subgingival curettage	The surface of the tooth root is planed to remove rough or contaminated cementum, dentine or deposits of calculus with curettage of the soft tissues of the periodontal pocket and removal of granulation tissue.
Gingivectomy	A surgical procedure to remove the soft tissue wall of the periodontal pocket or swollen gum tissue.
Periodontal flap surgery	Incision and raising of a flap of gingival tissue to enable removal of inflammatory or granulation tissue.
Crown lengthening	A flap procedure to establish an apical gingival margin for greater exposure of the tooth structure.
Osseous graft	A surgical procedure in which a piece of bone or a synthetic substitute is used to replace or repair alveolar bone.
Osseous surgery	Re-shaping and modifying defects and deformities in the bone supporting and surrounding teeth.
Gingival graft	Transference or transplanting gingival or other soft tissue from a donor area in the patient's mouth to an area around a tooth or implant to remedy a gingival deficiency.

Oral Surgery

Procedure/Terms	Definition
Nonsurgical removal of teeth	Removal of teeth not requiring a surgical incision (ie without incision of mucosa).
Sectional removal of teeth	Removal of teeth in sections. Bone removal may be necessary however a surgical incision is not required.
Surgical removal of teeth	Removal of teeth where a surgical incision is required.
Full upper dental clearance	Removal of all remaining teeth in the upper jaw.
Full lower dental clearance	Removal of all remaining teeth in the lower jaw.
Full dental clearance	Removal of all remaining teeth in the jaw.
Surgical removal of teeth requiring bone removal and tooth division	Removal of teeth where both removal of bone and sectioning of the tooth is required following a surgical incision.

Endodontics

Procedure/Terms	Definition
Pulpotomy	Removal of part of the vital tooth pulp from the pulp chamber. The remaining pulp is then covered with a protective dressing or cement.
Obturation	The phase of a root canal treatment that creates a fluid tight seal along the length of the root canal system.
Extirpation of pulp	Removal of pulp, or necrotic debris of pulp from a tooth's root canal system.

Restorative Types

Procedure/Terms	Definition
Restoration	Construction and insertion into a tooth of a restoration which may be metallic, resin-based or porcelain.
Pin retention	Small pins are inserted into the tooth to provide extra support for the restoration material.
Stainless steel crown	A preformed crown is trimmed, contoured and used as coronal tooth restoration.
Post	Insertion of a post into a prepared root canal to provide an anchor for an artificial crown or other restoration.

Prosthodontics

Procedure/Terms	Definition
Cast for crown	A post and core fabricated accurately to the dimension of a prepared root canal to provide a foundation for an artificial crown.
Temporary Crown	Construction of a temporary restoration usually made from a resin, to protect the underlying tooth prior to construction of permanent crown.
Full Crown	An artificial crown or full veneer is used to restore a tooth's size, shape and strength.
Pontic Bridge	That part of a bridge which replaces clinical crowns of missing teeth.
Complete denture	A removable dental prosthesis constructed to replace all missing teeth and tissues.
Partial denture	A denture provided for a dental arch in which one or more natural teeth remain.
Partial denture components - Retainer	Metal clasp carefully designed to fit round a tooth. Its main purpose is to hold the denture in place.
Partial denture components - Occlusal rest	A unit of a partial denture that rests upon a tooth surface to provide support for the denture.
Partial denture components - Connecting bar	A bar that joins sections of a partial denture.
Overlay	An extension of a denture covering the occlusal surface of remaining teeth.
Immediate replacement of tooth	This procedure involves the addition of one or more teeth to a denture.
Resilient lining	A resilient tissue bearing surface is added to a denture
Denture maintenance - Relining	Replacement of the tissue fitting surface of a denture to improve its accuracy and fit.
Denture maintenance - Remodelling	Replacement of the resin base of a denture to improve its accuracy and fit. It is different from rebasing in that it also permits rearrangement of teeth.
Denture maintenance - Rebasing	This involves the removal and replacement of a denture base.
Splints	An appliance constructed from either acrylic resin or metal designed to hold or maintain mobile teeth in their predetermined position.
Obturator	A prosthesis constructed to close a congenital or acquired opening in the palate. Usually attached to a partial or complete denture.
Denture characterisation	This process involves the staining and carving of the outer surfaces of the denture.
Dental impression	A negative imprint from which a reproduction or cast can be made.

Orthodontics

Procedure/Terms	Definition
Removable orthodontic appliance - Passive removable appliance	An appliance designed to maintain the position of the teeth.
Removable orthodontic appliance - Active removable appliance	As opposed to the passive appliance, an active appliance exerts force on teeth or arches to achieve tooth or dental arch movement.
Fixed orthodontic appliance - banding	The application of bands and/or brackets to correct tooth position or arch form.
Extraoral appliance	Extraoral head gear connected to an intra-oral appliance which makes use of the support of the back of the head and neck to transmit extraoral force which is then distributed to the teeth.

General Dental Services

Procedure/Terms	Definition
Occlusal splint	An appliance made of acrylic resin which is designed to relieve abnormal pressures exerted on the temporomandibular joint (TMJ) and other supporting structures.

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