

## IMPLANT ABUTMENTS- CLASSIFICATION AND SELECTION

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### ABSTRACT

The ideal goal of modern dentistry is to restore the patient to normal form, function, comfort, esthetics, and health. Implant dentistry is unique because of its ability to achieve these ideal goals regardless of the atrophy, disease or injury of the stomatognathic system. After completing second stage surgery and removing the gingival former, in order to affix a final prosthesis to the implant, an abutment must be used as an intermediate device. Abutments can be obtained from the manufacturer in machined form or can be custom-cast by a laboratory using manufactured gold or plastic components or milled.

#### Key words:

Implant abutments, Abutment selection, Abutment classification

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## INTRODUCTION

The ideal goal of modern dentistry is to restore the patient to normal form, function, comfort, esthetics, and health. An endosteal implant consists of two main parts, the implant body and the prosthetic component. An abutment is a component that is intermediate between the implant and the restoration and is retained to the implant by a screw.

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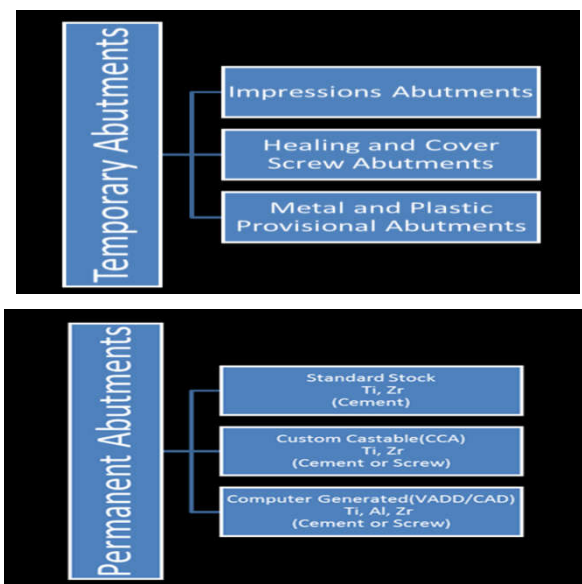
Currently there is an increasing interest in CAD/CAM systems for implant prosthodontics. CAD/CAM systems for the fabrication of implant abutments have used metals such as titanium and titanium alloy, and ceramics such as aluminum oxide and zirconium oxide. <sup>3</sup>

#### Definition

Dental implant abutment is defined as a component of a dental implant that is used to support and/ or retain any fixed or removable dental prosthesis. <sup>4</sup>

Abutments can be broadly classified into two forms

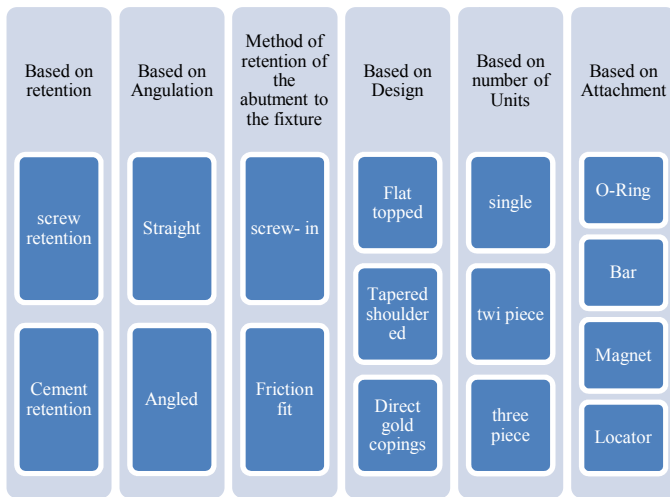
1. Temporary Abutments
2. Definite Abutments



Types of Implant Abutment<sup>5,6</sup>

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### Depending Upon Retention

Abutment for screw retention  
 Abutment for cement retention  
 Abutment for attachment

### Depending Upon Angulation

Straight abutment  
 Angled abutment

### Based on the Method of Retention of the Abutment to the Fixture

Screw in  
 Friction fit

### Depending Upon Design

Flat topped abutment  
 Tapered shouldered abutment  
 Direct gold copings

### Based on Number of Units

Single Piece  
 Two Piece  
 Three piece TMA

### Based on Attachments

O-ring attachment  
 Bar Attachment  
 Locator Attachment  
 Magnetic Attachment

### Based on Attachments

O-ring attachment  
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### Straight Abutment

It is an abutment whose body is parallel to the long axis of the implant. Indicated for replacing single tooth for large prosthesis upto full arch, implant borne reconstructions. It is used only when emergence profile are parallel if abutments are not parallel – can be prepared by Direct method

### Indirect method

#### Angled Abutment

An abutment whose body is not parallel to the long axis of the implant. It is utilized when the implant is at a different inclination in relation to the proposed prosthesis available in angulations from 10-30 degrees

- improved esthetics
- To correct path of insertion
- Increase in angle – increase risk of fracture
- placed as deeply as possible with most favorable axis orientation



CAD/ CAM has introduced methods of fabricating the final impression with digital methods of impression making and scanning and then milling out prefabricated metal alloys to produce a restoration that is more precise than the traditional casting methods.

### Some of the CAD/ CAM Systems Commonly used are

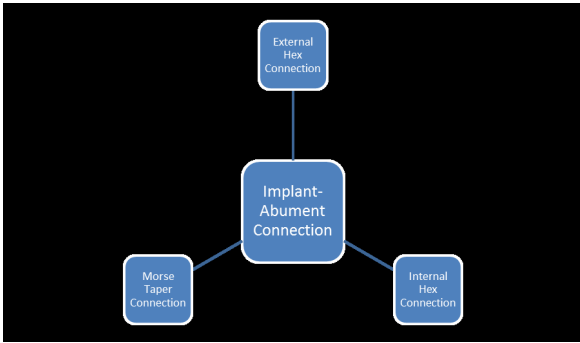
1. Noble Procera
2. Bella TekEndocde
3. Straumann CARES
4. Atlantis

### Ucla Abutments

The UCLA-Type Abutment is attached directly to the implant. It provides a pattern for the creation of a screw retained veneered crown. Sterngold-Impla Med's UCLA Type Abutments are available in single-implant (hexed) and multi-implant (nonhexed) designs. This abutment is well suited for sites with minimal thickness of soft tissue. It is available in traditional plastic configurations, gold alloy, gold base with plastic sleeve, and in a titanium version for provisional restorations.

- Precision machined.
- 1mm margin height.
- Titanium Prosthetic Screw included with all abutments.
- Narrow chimney.
- Micro - grooved finish for better wax retention, except waxing sleeve which is smooth.
- Waxing Screw included with gold abutments

### Antirotational Features of Abutment



#### External Hex

- The external hex is the original prosthetic connection for the dental implants designed by Dr. Branemark. Most widely available. This design offers a great variety of restorative options due to the interchangeability of abutments among manufacturers. Found on top of abutments.
- Hexagonal geometry



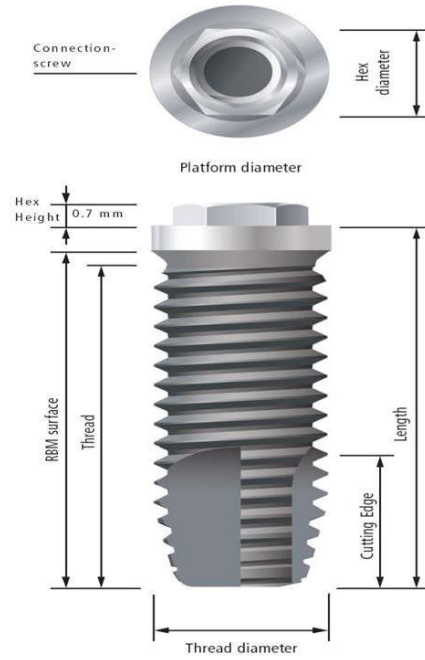
#### Internal Hex

Provides more precise implant abutment interface. There is less abutment movement once it is seated and fastened. Disadvantage – screw loosening. It seats the abutment into hexagonal depression.



#### Spline Attachment

- Splines are fin to groove anti rotational design
- The Spline implant connection (Sulzer Calcitek) consists of 6 external parallel keys (splines) alternating with 6 grooves
- Consist of six external components which protrude 1mm from implant and are matched to a female embedded in an abutment base.



#### Morse Taper Attachment

- A true Morse tapered implant interface connection is available (Bicon, Boston, MA) without any threaded component.
- The abutment has a 1.5 degree tapered post that fits into a smooth mirror image shaft within the implant.
- Resist rotation and even removal
- Also referred to as cold welded design



#### Guidelines for Abutment Selection

##### Depth of Soft Tissue

vertical height from implant head to the gingival margin. Measured with periodontal measuring probe 6-8 weeks following Stage 2 surgery. labial margin of abutment is atleast 1mm subgingival. Marked discrepancy between gingival heights around the margin – preable abutment is indicated. Diameter close to that of cervical margin of tooth

##### Emergence profile

Need atleast 3mm of vertical space from implant head to gingival margin. Allows gradual transition from implant head

##### Orientation

Ideally implant is placed close to the long axis of missing tooth (through incisal tip or just palatally). Small degree of labial angulation – easily accomodated with standared abutments. If more labial angulation needed – use of standard abutment leads to excessively contoured labial surface. Porcelain surface

too thin to mask metal structure. Better results achieved with preable / fully customised abutment.

### **Interocclusal Space**

Space from implant head to opposing tooth

Vertical space of 6-7 mm – standard abutment

5mm of space – preable abutment

Less than 5mm of space – vertical dimension of occlusion increased, deeper implant placement

Special esthetic requirements

Angulated abutments – for esthetics and biomechanical reasons

### **CONCLUSION**

Traditional dentistry provides limited treatment options for the edentulous patient. Because the dentist cannot add additional abutments, the restoration design is related directly to the existing oral condition. However, implant dentistry can provide a range of additional abutment locations. Bone augmentations may modify the existing edentulous conditions further in the partial and total edentulous arch and therefore also may affect the final prosthetic design. As a result, a number of treatment options are available to most partially and completely edentulous patients.<sup>7</sup>

The long-term success of osseointegrated root-form dental implants for oral rehabilitation is predicated on predictable integration with osseous as well as gingival tissues.<sup>8</sup>

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### **References**

1. Misch CE, Misch CM. Generic Terminology for Endosseous Implant Prosthodontics. *J Prosthet Dent* 1993; 69:809-12
2. Preiskel HW. *Overdentures Made Easy*, Quintessence Publishing
3. Grossman Y, Pasicuita M, Finger IM. A novel technique using a coded healing abutment for the fabrication of a CAD/CAM titanium abutment for an implant-supported restoration. *J Prosthet Dent* 2006; 95: 258-61
4. Glossary of Prosthodontic Terms 9
5. Stevens, Fredrickson, Gris. 2004 *Implant Prosthodontics*, Quintessence Publishing
6. Cibikra RM, Nelson SK, Lang BR, Rueggeberg FA. Examination of implant-abutment interface after fatigue testing. *J Prosthet Dent* 2001; 85:268-75
7. Block MS, Kent JN. *Implants in Dentistry*, W. B. Saunders Company
8. Misch CE. *Contemporary Implant Dentistry*. 2002 Elsevier Mosby publication

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