# Guidelines in Prosthetic and Implant Dentistry


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# Guidelines in Prosthetic and Implant Dentistry


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*Honorary Curator, BSSPD*


### Guides to Standards in Prosthetic Dentistry - Complete and Partial Dentures.

Produced by a working party from BSSPD and approved by the Council of BSSPD. R M WINSTANLEY (CHAIRMAN) M J BARSBY A R OGDEN R D WELFARE

### Guidelines on Standards for the Treatment of Patients using Endosseous Implants.

Produced by a joint working party from BSSPD and the British Association of Oral and Maxillofacial Surgeons (BAOMS) and approved by the councils of BSSPD and BAOMS.

BAOMS: J I CAWOOD (CHAIRMAN), S H FOREMAN, M O HINDLE

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### Prosthetic Dentistry Glossary (Revision 1995)

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# Foreword

It is now over 10 years since the first Guides to Standards in Prosthetic Dentistry were published in the UK. The publication, which originally incorporated only complete and partial dentures, has now been revised and is presented in this volume along with a Glossary of Prosthodontic Terms and also a Guide to Standards in Implant-based Prosthodontics. This edition is most timely since implantology is now a well tried addition to our armamentarium in the management of the edentulous and partially dentate patient. However, there are many indications that practitioners are employing implants without adhering to any appropriate code of practice. There are now a multiplicity of different implant systems on the market and a clear knowledge of these and the principles behind their handling is essential before formulating treatment plans.

The working parties of the British Society for the Study of Prosthetic Dentistry who have formulated these comprehensive guides have widely consulted the Council of the Society and members experienced in the clinical management of patients. They strongly recommend that all practitioners involved in the prosthetic care of patients adhere to these guides. The Council would further urge practitioners to attend appropriate programmes of continuing education in the fields of prosthodontics in an effort to stay up-to-date and ensure confident and successful treatment.

The Council and members of the British Society for the Study of Prosthetic Dentistry trust that these comprehensive guides to standards in prosthetic dentistry will assist and encourage practitioners in the pursuit of ever higher clinical standards in the treatment of patients.

Professor Ian Benington
BSSPD President 1995-96

# GUIDES TO STANDARDS IN PROSTHETIC DENTISTRY - COMPLETE AND PARTIAL DENTURES

## A Report by the British Society for the Study of Prosthetic Dentistry

R M WINSTANLEY (CHAIRMAN) M J BARSBY A R OGDEN R D WELFARE

# Foreword

At the request of the Council of the British Society for the Study of Prosthetic Dentistry in 1990, a Working Party was convened to review the Code of Practice formulated for prosthetic dentistry by the Society in 1981. We are pleased to report that very few changes were considered necessary. This is a tribute to the foresight and hard work of the original Working Parry whose remit was set out in their report [1].

The revised guidelines relate to the practice of complete and partial prosthodontics including the technical aspects of denture construction. They refer to the minimum acceptable standards appropriate to the United Kingdom. It was agreed by Council that standards for implant retained prostheses should form the remit of another

# The Construction of Complete Dentures

Complete dentures are constructed to restore normal speech, provide occlusal and facial support and adequate masticatory function. They should have a pleasing appearance, be comfortable to wear, and not prejudice the health of the supporting tissues. There can, however, be no guarantee that they will satisfy all these criteria for patients who have poor denture control skills, inadequate foundations, or intolerance to prostheses. Preparation of the mouth prior to treatment and the design of complete dentures is the responsibility of the dentist.

## A) CLINICAL PROCEDURES

### Diagnosis and treatment plan

In order to formulate the treatment plan a medical and dental history should be taken and a clinical examination carried out, in conjunction with radiographs where necessary. Previous dentures should be examined in conjunction with any complaints from the patient. Any pathological conditions should be investigated and appropriate treatment provided in order to render the oral tissues healthy before final impressions are made. Any elective surgery should be carried out at an appropriate stage.

### Primary impressions

The requirements of the primary impressions are that they should accurately record clinically relevant landmarks of the edentulous mouth without excessive tissue distortion. They should be taken in rigid stock trays modified as necessary to fit the form of the denture bearing area.

Maxillary impressions should record the following:

i) The residual ridge, tuberosities and hamular notches.
ii) Functional labial and buccal sulci, including the fraena
iii) The hard palate and its junction with the soft palate.

Mandibular impressions should record the following:

i) The residual ridge and retromolar pads.
ii) Functional labial and buccal sulci, including the fraena and the external oblique ridges.
iii) The lingual sulcus, lingual fraenum, mylohyoid ridge and retromylohyoid area. The impression should be recorded with the mylohyoid muscle in a functional raised position.

Where the impression is over-extended in relation to the functional depth of the sulcus, a clear indication should be made on the impression or resultant cast to help the technician in the construction of special trays.

Appropriate spaced or close fitting rigid trays should be requested in the laboratory prescription, depending on the type of impression material and technique to be used and the anatomy of the denture bearing area. The site for any stops as well as the amount of spacing should be stipulated by the clinician.

**Working impressions**

These should record the entire functional denture bearing area to ensure maximum support, retention and stability for the denture during use. Each special tray should be examined in the mouth and adjusted as necessary to satisfy the above requirements.

To ensure adequate lip and cheek support the maxillary impression should show an intact rounded record of the labial and buccal sulci, together with the fraena. It should extend posteriorly to the hamular notches and just beyond the junction of hard and soft palates. The mandibular impression should show an intact rounded record of the labial, buccal and lingual sulci, including the fraena. It should extend posteriorly to cover the retromolar pads.

Impressions should be boxed or the borders marked appropriately before the casts are poured in order to preserve an accurate record of the functional depth and width of the sulci.

**Recording jaw relation (maxillo-mandibular relation)**

The bases which carry the occlusal rims should be rigid and stable. The upper rim is modified to give correct lip support. The incisive papilla provides a useful biometric guide to the prominence of the rim, its centre lying 8-10mm palatal to the labial surfaces of the maxillary central incisors (in the natural dentition). Patients' wishes, or previous satisfactory dentures, may dictate otherwise.

The length of the upper rim should be adjusted to indicate the level for the upper anterior denture teeth and the antero-posterior (occlusal) plane made parallel to the interpupillary and alar-tragal lines (unless facial irregularities warrant an alternative).

A centre line should be marked on the upper rim. This will usually be coincident with the midline of the face.

The occlusal vertical dimension should provide for most patients a minimum inter-occlusal clearance (freeway space) of 2-4 mm in the premolar region. It is established by adjustment of the lower occlusal rim and verified using various techniques of clinical measurement.

Failure to provide sufficient freeway space may lead to discomfort, pain, and bone resorption while excessive freeway space may lead to discomfort from the temporomandibular joints, cheekbiting, angular cheilitis, and poor appearance. Progressive incremental additions of acrylic resin to the occlusal surfaces of existing or diagnostic dentures may be necessary before a satisfactory occlusal vertical dimension can be established.

The horizontal jaw relationship to be recorded at the established occlusal vertical dimension is retruded contact position (RCP). This is a reproducible position at which the denture teeth are placed in intercuspal position (ICP). Once this position can be reproduced, the bucco-lingual width of the occlusal rims should be adjusted to identify the "denture space" (neutral zone). This is important in order to provide tongue space, facial soft tissue support, and denture stability. In some instances functional recording of the mandibular denture space may be appropriate using a suitable impression material on a stable base.

The occlusal rims must be located securely together in RCP in the mouth using an accepted technique. The use of a facebow may be desirable with a semi-adjustable articulator, although in the majority of situations an average value articulator will suffice. In this latter case, any change in

occlusal vertical dimension will require new records to be taken.

The prescription accompanying the registration should give details of mould, shade, material, and manufacturer's brand of chosen teeth. A diagram may help the technician with the arrangement. The cusp form, material, and size of posterior teeth should be selected. The number of teeth to be used and their anatomical type should be recorded. When setting up the teeth it is usual to limit the lower occlusal table to the horizontal part of the ridge and to avoid placing teeth over an inclined plane.

An impression of a previous denture may be helpful to the technician where a particular form of anterior tooth arrangement is to be repeated.

**The trial insertion**

The occlusal plane, occlusal vertical dimension, and RCP should be verified as correct. Tooth position and arrangement should provide adequate lip and cheek support and tongue space, allow clear speech, and give a pleasing appearance to the patient. Where alterations are required to the horizontal or vertical jaw relationship, a new recording will be required and a re-try necessary.

The position of the posterior palatal border of the maxillary base should be examined to ensure it is correctly extended just beyond the junction of hard and soft palate. The foveae palati act as a useful landmark, lying 2-3 mm behind the posterior margin of the hard palate. It is the clinician's responsibility to mark or cut a post dam on the master cast in the appropriate position unless a functional post dam was incorporated into the final impression. The patient should be given the opportunity to see the trial dentures in place at this stage. It is wise for them to agree verbally (and ideally in writing) that the appearance is satisfactory.

**Insertion of the dentures**

The denture bases should be inspected and any remaining surface blemishes or defects removed. Each denture should be inserted and assessed for retention, extension, appearance, and stability. Factors assessed at the trial stage such as lip support, speech, and horizontal and vertical jaw relationships should be reconfirmed as correct. Articulating paper or foil may be used to examine occlusion and articulation in the mouth, although this should be carried out with caution to avoid errors.

A pressure indicating paste or other suitable recording material may be used on the fitting surfaces of the dentures to indicate excessive tissue displacement.

A check record is a useful method for refining the occlusion, the dentures being remounted on the original articulator and adjustments carried out to provide correct articulation. It is recommended that the processed dentures are remounted on the articulator following deflasking (for example using the split-cast method), and the occlusion adjusted. A check record may not then be necessary at the insertion stage, but could be valuable at the review appointment after the dentures have been worn for a period and the supporting tissues have adapted to them.

Instructions (both verbal and written) on the use and care of dentures should be given to the patient, and a review appointment made approximately one week later.

**Inspection and review**

At the review appointment, any adjustments should be made to the dentures in

the light of the patient's experiences or complaints. The denture bearing areas should be examined for trauma even in the absence of patient complaints. The occlusion and articulation should be examined at this stage.

The importance of attending for regular review should be explained to the patient.

**Addendum**

The above guidelines are meant to cover techniques used in the different stages of complete denture construction. However, it is accepted that variations may occur, some of which are listed below:

1) Copy/duplication techniques are extremely valuable for many patients, particularly the elderly. The techniques have been well documented and enable replicas of previous satisfactory dentures to be made with a minimum of clinical visits.

2) Making working impressions in a patient's existing dentures may eliminate the need for primary impressions, special tray construction and occasionally jaw registration rims.

3) Using appropriate impression materials, and by modifying stock trays, acceptable working impressions can be made without the need for special trays in some situations.

NB Due regard should be given to the disinfection and sterilisation of all materials/prostheses which pass from clinician to laboratory and vice versa, according to health and safety requirements. British Dental Association advice sheets A32 and A123 should be followed routinely.

**B) TECHNICAL PROCEDURES**

The clinician is responsible for the provision of complete dentures. At each stage the dentist should provide a clear prescription for the laboratory. If the technical quality of the dentures is inadequate it is the clinician's responsibility to have the problem remedied

**Primary casts and special trays**

Surface moisture should be removed from the impressions after rinsing and before casting. Plaster of Paris and dental stone (50/50 w/w) are vacuum mixed with water. The impressions are cast using vibration to eliminate air bubbles and separated from the cast after 40 minutes. The cast should record the depth and width of the sulci and be surrounded by a "land" width of at least 3 mm. The base should be 1 cm thicker than the deepest part of the impression. The "land" area should always be recorded unless the extent of the special tray has been indicated on the impression by the clinician.

Special trays are made according to the clinical prescription, which will stipulate the amount of spacing (if any) and stops. Handles must be designed to avoid distortion of the tongue or lips. The periphery of the tray should normally extend to the deepest part (or slightly short if border moulding techniques are to be used) of the functionally recorded sulcus, or to the indication on the cast made by the clinician. In the maxilla it should extend posteriorly to the hamular notches and fovea palati; in the mandible to the distal aspect of the retromolar pads.

**Working casts and registration blocks**

Surface moisture should be removed from the impressions after rinsing and before casting. Dental stone in the correct measure is vacuum mixed with water and the impression cast. The thickness of the base and the width of the "land" is the same as for primary casts.

The base of the registration block should normally be made of a rigid material. Close adaptation of the base to the working cast is essential for stability in the mouth and accurate registration of jaw relations.

Registration rims are usually made of wax. The upper block should measure approximately 22mm in height from the deepest part of the sulcus adjacent to the midline fraenum. The equivalent dimension of the lower block should measure approximately 19mm.

Wax rims are positioned buccolingually in the same place as the lost teeth, according to the amount of resorption that has taken place. The occlusal surface of the lower rim passes posteriorly from its anterior edge to a point 2/3 up the retromolar pads. The upper rim usually passes posteriorly parallel to the surface of the maxillary ridge.

**Mounting and setting up**

The registration blocks are mounted on a semi-adjustable or average value articulator (according to clinical requirements), preferably using the split cast technique. After noting the prescription for tooth arrangement, the maxillary anterior teeth are set up in accordance with the marked centre line, always conforming to the contour of the wax rim.

Unless the prescription says otherwise, or a neutral zone technique has been used, the mandibular posterior teeth are placed to conform to the buccal contour of the wax rim. It is wise, particularly with flat lower ridges, to avoid the most posterior tooth being positioned over an inclined plane, and to achieve this the last tooth should be at the posterior extremity of the horizontal part of the ridge.

The teeth are adjusted to allow balanced articulation in lateral and protrusive excursions. Any part of the try-in base removed to facilitate registration is replaced unless this interferes with occlusal balance.

**Processing and finishing**

While in occlusion on the articulator, the try-in is sealed to the casts with wax around the denture periphery. Following processing, the dentures (still on casts) should be replaced on the articulator, by means of the split cast, and any processing errors removed by occlusal adjustment.

Finishing and polishing is carried out carefully to preserve the recorded periphery. Apart from the removal of imperfections, the fitting surface remains untouched. The completed dentures should be stored in clean water (with antiseptic as appropriate) after removal of traces of polish. Denture identification is a desirable option with complete dentures.

**Check record**

Where this is requested, it is preferably carried out on the original casts if possible. Failing this, the dentures may be remounted on an articulator using quick setting plaster and occlusal adjustments carried out.

# The Construction of Partial Dentures

Partial dentures should assist the mastication of food, be cosmetically pleasing, and help maintain normal speech. They may also be required to maintain oral health and prevent tilting and overeruption of natural teeth. They should never be made merely to "fill gaps" in the mouth and should be designed and constructed in such a way as to minimise oral damage. A high standard of oral hygiene is necessary on the part of the patient. The underlying principles of support, retention and stability should be understood whatever type of partial denture is to be made. Their provision should only be undertaken by registered dental practitioners.

## A) CLINICAL PROCEDURES

Diagnosis and treatment plan

In order to formulate the treatment plan a medical and dental history should be taken, noting the patients' complaints, dental experience, attitude and medical background. The natural teeth should be examined, their number, position and occlusal relations noted, and evidence of caries, plaque, periodontal diseases and tooth mobility recorded. The state of the mucosa should be examined and previous dentures inspected in relation to the natural teeth and the patient's experience. Radiographs of the teeth and supporting tissues are necessary. Pathological conditions should be investigated and treated appropriately.

Teeth which require extraction, periodontal treatment, conservative treatment, or any other necessary treatment should have this carried out prior to partial denture construction. However, the provisional design of the dentures should be made early in the treatment plan in order that the most appropriate restorations are placed in any natural teeth which will act as abutments for the partial denture. Dietary advice and attention to oral hygiene should be given as appropriate.

**Impressions for study casts**

Study casts are essential, along with clinical and radiographic examinations, in the assessment and planning of partial dentures.

A suitable elastic impression material in a rigid tray, modified where necessary, should be used to record the teeth, palate, edentulous areas and labial, buccal and lingual sulci. Casts should be poured in stone and, where the occlusion is selfevident, mounted on an articulator in the intercuspal position (ICP). In some instances it is possible to hand-hold the casts for analysis of the occlusion. Where the occlusion is not self evident, occlusal rims should be constructed and either ICP or the retruded contact position (RCP) recorded, depending on the natural teeth present and the position required. A facebow record may be taken where a semiadjustable articulator is to be used. The mounted casts should be examined and the occlusion compared with that of the patient. It is important that they exactly coincide unless alteration to the relationship is being made deliberately.

**Partial denture design**

The design of a partial denture is the duty and responsibility of the clinician. The dentist should survey the cast and choose the most appropriate path of insertion for the denture in relation to suitable guide planes, tooth and bone undercuts and appearance. However, restorative work involving technical procedures requires a close relationship between clinician and technician. Discussion of a proposed design with the technician can only be of benefit to the success of the treatment. The framework should be designed outlining the saddle areas, occlusal and other support, the direct retainers and any necessary indirect retention to prevent rotation. Resistance to lateral and anteroposterior displacing forces should be planned, and connectors should be rigid and strong with minimal gingival coverage.

Any tooth alteration procedures necessary to improve the effectiveness of the design should be noted. The design and written instructions should form a comprehensive prescription for the laboratory to follow, aided where possible by a design drawn on the study cast.

Where anterior teeth are being replaced, it is valuable at this stage (and certainly prior to construction of a metal framework) to try in a waxed up denture to determine the final position of the teeth so that the technician can place the retentive components for the teeth and saddle in the most favourable position.

**Working impressions**

After all tooth preparation and restorative procedures have been carried out according to the treatment plan, verification should be made that there is sufficient clearance for the denture base and components. Final impressions should be recorded using either a modified metal stock tray or preferably a rigid special tray. When a cast metal framework is to be constructed such impressions should be recorded in a dimensionally stable elastomeric material. Where alginate is used, stone casts should be poured immediately to minimise dimensional change. Each impression should be examined for defects and the surface should exhibit clear detail. No part should be detached from the tray.

Master casts should be treated with great care to avoid the risk of abrasion. Duplicate master casts should be made for use at a later stage.

**Recording jaw relationships**

The occlusion will already have been recorded as outlined under "Impressions for study casts". However, for greater accuracy, where a cast metal framework is to be constructed the jaw relationship should be recorded again using occlusal rims (if appropriate) constructed on a duplicate master cast. Where anterior teeth are being replaced, a wax trial denture should have been constructed on a duplicate master cast and tried in the mouth before construction of the metal framework in order to indicate to the technician the position of retentive components and/or any necessary "backings", as outlined previously.

**Construction of the metal framework**

It is essential that written and diagrammatic instructions are submitted to the laboratory on an appropriate prescription form. Both clinician and laboratory should retain a copy. The path of insertion, and the positioning of critical borders of major connectors, tissue relief (where necessary) and tissue stops for distal extension saddles

indicated by the clinician should be noted by the laboratory along with the rest of the design. Mounted duplicate casts should be returned to the laboratory at this stage to indicate occlusal relationships, as should wax trial dentures using anterior teeth.

**Try-in of the framework**

The framework should be presented on mounted master casts. On trying in the mouth, any minor errors may be located using a disclosing material and corrections made to ensure a precise fit. However it is wise to assume that if the casting fits the master cast accurately but does not fit the mouth (assuming there is no obvious reason), a new impression and remake will be necessary.

Occlusal relationships should be examined with the framework in the mouth and any interferences with the opposing teeth noted. Only minor interferences can be dealt with by altering the framework since excessive thinning increases the risk of subsequent fracture. There should be a minimum thickness of 1 mm at the rest/minor connector junction. Although adjustment of opposing teeth as part of the treatment plan to provide a satisfactory denture is acceptable, modification at the try-in stage because of lack of room demonstrates poor clinical practice.

An occlusal rim may be placed on the framework to record the jaw relationship again if this is found to be in error, provided the framework does not interfere with the occlusion.

With a distal extension saddle, the altered cast technique may be used to give a more stable denture.

The shade, mould and material of the denture teeth should be selected at this stage if not already recorded.

**Trial insertion**

The trial partial denture should be tried in the mouth to check occlusion, appearance and speech, and should be satisfactory to both clinician and patient. It is wise for them to agree verbally (and ideally in writing) that the appearance is satisfactory.

**Final insertion**

The finished partial denture, which has been processed on the blocked-out master cast, should ideally be presented to the clinician on the duplicate master cast mounted on the articulator. The occlusal relationship should be checked once again to ensure that there are even bilateral contacts at the correct horizontal and vertical jaw relationship and that the denture does not cause any occlusal interferences. No adjustment should be required, although it may be necessary to correct processing errors. The fitting surface of the saddles should be checked with a disclosing paste or other suitable material and any pressure areas relieved. Instructions are given to the patient on the use and care of the partial denture, in particular the need to maintain good oral hygiene and health of the natural teeth and soft tissues. The need for careful handling of delicate components should be stressed.

**Inspection**

After the denture is fitted, the patient should attend for inspection approximately one week later. Any adjustments may be carried out, and the need to attend for regular review stressed

NB Due regard should be given to the disinfection and sterilisation of all materials/prostheses which pass from clinician to laboratory and vice versa, according to

health and safety requirements. British Dental Association advice sheets A32 and Al 23 should be followed routinely.

## B) TECHNICAL PROCEDURES

The clinician is responsible for the provision of partial dentures. At each stage the dentist should provide a dear prescription to the laboratory. If the technical quality of the dentures is inadequate it is the clinician's responsibility to have the problem remedied.

### Primary casts and special trays

Surface moisture is removed from the impressions before casting. Plaster of Paris and dental stone in the proportions 50/50 (w/w) are vacuum mixed with water, the impression being cast using vibration to eliminate air bubbles and removed from the cast 40 minutes after setting. The base must be at least 1 cm thicker than the deepest part of the impression. Special trays are made according to the clinician's prescription which will stipulate the amount of spacing (this will depend on the type of impression material to be used for the working impression) and position of any stops.

### Working casts and registration blocks

The surface of the impression is rinsed with water and dried with air. Dental stone for acrylic resin dentures, and class 4 diestone for cobalt chromium dentures, in correct measure, is vacuum mixed with water and the impression cast in the same way as for primary casts. The tray should be carefully removed and may need to be sectioned to avoid fracture of teeth on the cast.

The casts should be surveyed using the path of insertion already indicated by the clinician on the primary casts. Unwanted undercuts should be blocked out using appropriate materials and the cast duplicated.

The base of the registration block is made from a suitable rigid material. Good adaptation of the base to the working model is essential for stability in the mouth and accurate registration of the jaw relations. Wax registration rims are positioned onto the saddle areas to be level with and no wider than the remaining standing teeth, and should be constructed on the duplicate master cast in the case of a metal framework.

### Mounting, metal work construction and set-up

The master casts are mounted with the aid of the registration rims on a semi-adjustable or an average value articulator, preferably using the split-cast technique.

The metal partial denture framework is constructed on a duplicated investment master cast, after the master cast has been prepared. The metal framework should fit accurately with no sharp edges, ensuring that clasp arms will not impinge on the mucosa and will terminate in the correct depth of undercut. It should also be highly polished on the non fitting surface.

### Altered cast technique

The clinician may at this stage have used an additional impression technique where free-end saddles are present. On receipt of the new saddle impression the old saddle area should be removed from the master cast, the denture framework seated and a new saddle cast (the new master cast will then need to be reduplicated).

After noting the prescription for tooth arrangement, the maxillary and mandibular teeth are set up to conform to the contours and occlusion of the remaining natural teeth.

**Processing and finishing**

While in occlusion on the articulator the try-in is sealed to the cast with wax around the edges of the saddles. After processing, the denture (still attached to the cast) is remounted on the articulator and any occlusal processing errors adjusted. Smoothing and polishing is carried out taking care to preserve the recorded periphery. Apart from the removal of surface imperfections, the fitting surface must remain untouched.

After completion, the denture is thoroughly cleaned of traces of polish before being placed in antiseptic to maintain the water balance and prevent cross infection. The denture should be presented to the clinician on the duplicate cast.

**Check record**

If the occlusion was recorded incorrectly the clinician will make a new registration. The dentures should be remounted onto the articulator using the new occlusal record provided and the occlusal surfaces of the artificial teeth adjusted until an even occlusion is achieved (where severe modification of the denture teeth is needed to achieve this, it may be necessary to replace them).

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M J Barsby, A R Ogden, R D Welfare

March 1994

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# GUIDELINES ON STANDARDS FOR THE TREATMENT OF PATIENTS USING ENDOSSEOUS IMPLANTS

**Produced by a working party from BSSPD and the British Association of Oral and Maxillofacial Surgeons (BAOMS)**

| | | | |
|---|---|---|---|
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This report first appeared as a supplement to the British Dental Journal: 178:(6), March 25 1995 and the text is reprinted by kind permission of the Editor of the BDJ and of the British Association of Oral and Maxillofacial Surgeons. It gives Pilot Guidelines which are in accordance with the custom and practice of the day.

# Foreword

**1** The need for guidelines on standards in the use of dental implants was recognised by the councils of the British Association of Oral and Maxillofacial Surgeons (BAOMS) and the British Society for the Study of Prosthetic Dentistry (BSSPD).

**2** A joint working group was convened in 1992 to draft guidelines which have been approved by the councils of both the BAOMS and the BSSPD.

**3** Members of group

**BAOMS:**

Mr J I Cawood (chairman)
Mr G H Forman
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**BSSPD:**

Mr R A Howell
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Professor R M Watson

**4** This document will relate to the intra-oral application of endosseous implants.

## 1. Introduction

**1.1** The aim of these guidelines is to inform both those offering advice and those providing treatment of the objectives and standards of care expected.

**1.2** The guidelines encompass treatment for the edentulous patient and the partially dentate patient, including those requiring single tooth replacement.

**1.3** An endosseous implant is a device that may be inserted into a jaw bone and is intended to support, retain and stabilise a fixed or removable prosthesis. Such implants have extended the range and effectiveness of preprosthetic surgery, and should be considered as a valuable adjunct in oral rehabilitation.

**1.4** The aim of oral rehabilitation involving implants is the restoration of oral function and facial form, which is rendered deficient as a consequence of loss or absence of teeth and related structures, and may be attained by a combination of surgical and prosthetic means.

**1.5** Published data, in refereed journals indicate that this aim may be achieved by placement of selected endosseous implants, which are of scientifically proven efficacy, either alone or in combination with other surgical procedures, depending on the degree of jaw bone loss, mucosal condition, opposing jaw relations and the state of the dental occlusion.

**1.6** These guidelines should be updated regularly to take account of continuing research and development.

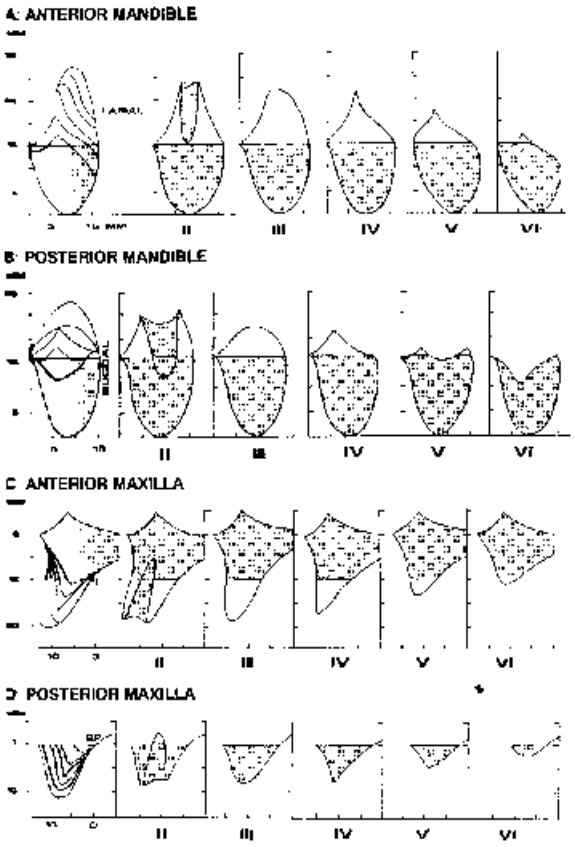


**Table 1 Classification of jaw form**

A: classification of anterior mandible

(anterior to mental foramina)

B: classification of posterior mandible (posterior to mental foramina)

C: classification of anterior maxilla

D: classification of posterior maxilla

I. Dentate

II. Immediate post extraction

III. Convex ridge form

IV. Knife edge ridge form

V. Flat ridge form

VI. Loss of basal bone that may be extensive but follows no predictable pattern

## 2. The consequences of tooth loss and jaw classification

**2.1** It is recognised that loss of teeth results in progressive loss of jaw bone.

### 2.2 The edentulous jaw

Loss of bone in the edentulous jaws leads to:

reduction of support for a prosthesis
alteration of the maxillomandibular jaw
encroachment of some muscle attachments in relation to the denture bearing area.

**2.3** The effect of these changes, combined with ageing, is circumoral hypotonia and collapse. This results in changes in facial form and appearance.

### 2.4 The partially dentate jaw

There are similar local changes to those occurring in the edentulous jaw, but in addition there is a potential for unfavourable changes in the remaining dentition.

**2.5** A classification of jaw form following tooth loss exists which assists communication and enables rationalisation of treatment. (Table 1 and Reference 1)

## 3. Criteria for the use of endosseous dental implants

**3.1** Successful application of implants depends on:

a favourable anatomical form and environment
biocompatability
favourable long-term biomechanical conditions.

**3.2** There must be adequate bone volume (height and width) to place implants safely without interfering with adjacent anatomical structures (such as the neuro-vascular bundle, maxillary sinus, floor of the nose and adjacent teeth)

The implants should not impinge or interfere with the function of the lips, tongue, and floor of the mouth.

**3.3** There must be enough bone volume to allow placement of implants of a sufficiently large dimension to withstand functional loading. It should permit optimal axial inclination to fulfil the functional and aesthetic requirements.

**3.4** The implant giving the maximum surface contact with bone should be placed to achieve optimal load distribution.

**3.5** The vertical, transverse and antero-posterior interjaw relationship should be favourable.

**3.6** If the foregoing conditions do not prevail, adjunctive surgical procedures, such as osteotomy, bone grafting and vestibuloplasty, should be undertaken.

**3.7** There must be adequate access for the surgical procedure. There must also be adequate space for prosthesis construction and for subsequent oral hygiene measures by the patient.

## 4. Assessment of the patient

**4.1** General assessment should include: patient's complaint
medical assessment
psychological
assessment social history
dental history.

**4.2** Local assessment should consist of both extra-oral and intra-oral

The extra-oral examination should include assessment of facial asymmetry, facial form tooth display, jaw relations and jaw function The intra-oral examination should include assessment of:

- the oral mucosa and the saliva
- the remaining dentition and periodontium
- the original ridge form, related muscle and soft tissue attachments,
- the amount and quality of attached mucosa
- the inter-occlusal and inter-ridge relations (vertical and horizontal).

**4.3** Radiological assessment should indicate:

- retained roots, unerupted teeth or any pathological conditions
- the jaw form and jaw relations
- quality of bone (sclerotic, porotic).

Standard diagnostic views are:

- panoramic tomography
- lateral cephalogram
- intra-oral films.

**4.4** Study casts, mounted on an articulator, are an important diagnostic aid.

**4.5** A detailed assessment of the jaw bone dimensions of quantity (height and width) and quality can be assessed using:

- radiographs with magnification markers (in conjunction with panoramic tomography and cephalogram)
- tomography
- ridge mapping techniques for assessing bone width multi-planar computerised tomography.

**5. Treatment planning**

**5.1** The restoration is influenced by the type, size, number and orientation of implants that can be planned in relation to anatomical, surgical and prosthetic considerations. If implants are to be placed in one jaw only, the prosthesis should be designed to take account of the remaining and opposing dentition or prosthesis.

**5.2** The final treatment plan is based on a combination of:

- patient assessment (see section 4)
- radiological analysis
- analysis of study models
- analysis of diagnostic wax-up/trial prosthesis
- patients' preferences.

**5.3** Radiographs indicate:

- adequacy of bone and/or the need for bone augmentation
- related anatomical structures
- jaw relationships
- orientation of potential implant placement relative to the jaw bone, adjacent teeth and the opposing teeth or jaw.

**5.4** Study casts should:

- where appropriate be mounted on an articulator, preferably using a face-bow, indicate jaw and occlusal relationships, both vertically and horizontally, and indicate the position and arrangement of any remaining natural teeth
- help decide the possible position and number of implants and the orientation of implants relative to the jaw bone and natural teeth. They may also act as a guide when bone augmentation may be indicated.

**5.5** Diagnostic wax-up/trial prosthesis relates tooth position in the restored arch to:

the residual ridge

any remaining natural teeth implant position

the opposing dentition or residual ridge

the necessity for a labial flange for optimal lip/cheek support

orientation of implants to allow a functional and aesthetic prosthesis to be constructed.

**6. The maxilla**

**6.1** With careful patient selection, endosseous dental implants can be used in the Class II and Class III ridge form.

**6.2** In selected patients with Class IV, V and VI edentulous maxillae, implants should be combined with augmentation of the maxilla using onlay techniques, inlay gfafting of the sinus and interpositional bone graft techniques. No literature is available, as yet, to attest to a 10-year, long-term validity of these methods. There is a need for controlled prospective clinical research to determine the effectiveness of these combination procedures.

**6.3** The choice of a fixed or removable prosthesis that is implant supported, retained or stabilised in the maxilla is influenced by the functional and aesthetic requirements, the patient's ability to maintain the prosthesis, and treatment cost.

**7. The mandible**

**7.1** With careful patient selection, endosseous dental implants can be used in the Class II, III ridge form, both anteriorly and posteriorly.

**7.2** It is recognised that surgical interference with the inferior alveolar nerve may lead to neuro-sensory alteration or loss.

**7.3** In the Class IV ridge form in the anterior mandible, contouring to remove a narrow ridge crest or an onlay bone grafting procedure may be required to achieve sufficient bone volume to accommodate an endosseous implant.

**7.4** In the Class V ridge form in the anterior mandible, an interpositional bone grafting procedure may be required to prevent unfavourable soft tissue encroachment that would interfere with prosthetic function.

**7.5** In selected patients with a Class VI ridge form in the anterior mandible, implants may be combined with augmentation bone grafting techniques to provide adequate bone volume for implants.

**7.6** Conclusive, long-term data on the use of implants with bone grafting procedures are not yet available.

**8. The implant team**

**8.1** Within the UK, few individuals have sufficient training, experience and expertise in both the surgical and prosthodontic disciplines to provide a comprehensive range of treatment necessary to rehabilitate the patient and deal with complications.

**8.2** A team approach is to be recommended. The implant team normally comprises surgeon (responsible for the implant treatment), prosthodontist (responsible for restorative or prosthetic treatment), technician, hygienist and nurse/DSA.

**8.3** Cooperation should exist between the prosthodontist and the surgeon during the assessment and treatment planning, be

maintained through the various stages of treatment. and prevail through the follow-up care of the patient. The prosthodontist and surgeon should be aware of the objectives and possible limitations of each treatment.

**8.4** In order that a functional prosthesis can be constructed, the implant position and inclination should be decided between prosthodontist, surgeon and technician. Most importantly, lack of cooperation could result in the placement of implants in positions,and with inclinations, which make them unusable.

**8.5** The overall responsibility for the design, function and the long-term after-care of the prosthesis rests with the prosthodontist. Monitoring of the implants would normally be carried out by the prosthodontist, but both surgeon and prosthodontist share a continuing responsibility for the success or failure of implant treatment.

## 9. The patient

**9.1** The patient has a duty to cooperate fully with all aspects of the treatment and after-care. Patient selection should be restricted to those patients who show a need and motivation for the implant procedures. Patients should have a realistic expectation of treatment and must be capable of maintaining an appropriate standard of oral health.

**9.2** The benefits of treatment must outweigh any risks. The treatment itself should not jeopardise unduly the existing dentition and should take into account the condition of the remaining dentition, its prognosis for survival and likely future treatment. Active periodontal disease and caries must first be controlled.

**9.3** The patient must be given a comprehensive explanation of the treatment, be aware of possible complications and feasible alternatives, and valid consent must be obtained.

## 10. General principles for surgical treatment

**10.1** Surgical treatment should be conducted according to established protocol. In particular, the surgical field should be suitably isolated and free from contamination at the time of preparing canals in the bone and the positioning of implant fixtures in the jaws. Sterile implants, packed and prepared by the manufacturer should be used in association with the recommended instrumentation. The careful preparation of bone to avoid overheating is an essential feature of the operation and for this copious irrigation, sharp instruments and low drill revolutions are necessary.

**10.2** The positioning of implants should be carried out according to an established treatment plan, avoiding vital structures (such as the inferior dental canal) and the roots of adjacent teeth. A surgical template, identifying the planned implant position and likely position of the artificial tooth crowns of the future prosthesis, is recommended for use in most cases. It is, however, desirable for the surgeon and prosthodontist to have considered the consequences of revising implant positions resulting from unfavourable bone quality or quantity in intended sites.

**10.3** Many systems recommend a two-stage procedure in which the endosseous component (fixture) remains isolated for several months within the jaw bone, in order to promote integration with the healing bone. This is the preferred technique

In single-stage procedures it is advised that the implant should not be loaded immediately.

## 11. General principles for prosthodontic treatment.

**11.1** Any temporary prosthesis should be designed to avoid pressure over implant sites.

**11.2** A definitive prosthesis may be:

Supported entirely by implants and may be fixed or removable by the patient depending on aesthetic, functional and maintenance considerations

supported by implants and residual ridge. This is removable by the patient (over-denture)
supported by implants and natural teeth (see paragraph 17.7).

**11.3** Leverage should be kept to a minimum and the extent of any cantilever should take into account the number, size and distribution of the implants and the rigidity of the superstructure.

**11.4** Selection of the appropriate occlusal scheme should be based on sound restorative principles and take into account the type of opposing dentition/prosthesis.

**11.5** An implant supported fixed prosthesis, used to restore the dentition of an edentulous jaw, should be retained by implants of appropriate size and number: a minimum of five in the mandible and six in the maxilla.

**11.6** An over-denture prosthesis used to restore an edentulous jaw normally requires a minimum of two implants in the mandible and four implants in the maxilla placed appropriately for effective support, retention and stability, together with maximal coverage of the denture bearing area.

**11.7** A partial, fixed prosthesis may be constructed on two or more implants. Due to the different behaviour of the attachment of the implant and natural tooth to bone, it is generally considered inappropriate to link implants and natural teeth with a prosthesis unless a device allowing for differential movement is incorporated.

**11.8** An implant restoration may be chosen as an alternative to a conventional replacement for an individual tooth. In the anterior maxilla, careful assessment and planning is needed to avoid producing an unsatisfactory appearance.

## 12. Follow-up maintenance

**12.1** Appropriate instruction in oral hygiene measures and care of the implants and prosthesis should be given during treatment, and reinforced at follow-up visits. Effective monitoring of the implants and the associated prosthesis is an essential part of treatment. Following delivery of the prosthesis, the patient should be reviewed regularly to ensure that they are maintaining a satisfactory standard of oral hygiene and that the prosthesis is functioning as intended. In particular, the tightness of fixing should be checked after one month.

**12.2** Regular inspection at yearly intervals is recommended after the first year.

**12.3** Assessment at review appointments is by:

assessment of plaque and calculus deposits

clinical evaluation of the mucosal cuff around implants including:
visual assessment (gingival index, and, if indicated, bleeding on probing and sulcus depth)

assessment of mobility of each implant by: percussion, application of rotational forces to the implant and electronic mobility tester

radiological examination, preferably using a long cone periapical radiograph to assess the level of marginal bone and to evaluate the implant bone interface.

**12.4** Resilient connectors and other components should be replaced as necessary according to the manufacturer's instructions.

**12.5** Inspection of the superstructure/prosthesis should be carried out to identify cracks or fractures which may indicate an inexactness of fit between the prosthesis and implants. Marked occlusal wear facets may indicate imbalance in the occlusion or parafunctional habits. Such damage should be corrected by a modification of the prosthesis and/or the occlusion.

## 13. Criteria for success

**13.1** Success must be judged over a long time span, which implies that patient follow-up must be regular, continuing and consistent, including clinical and radiographic examinations.

**13.2** To be judged successful the outcome of implant treatment should meet the criteria proposed by Albrektsson et al. These are:

that an individual, unattached implant is immobile when tested clinically

that a radiograph does not demonstrate any evidence of peri-implant radiolucency

that vertical bone loss be less than 0.2 mm annually following the implant's first year of service

that individual implant performance be characterised by an absence of persistent and/or irreversible signs and symptoms, such as pain, infections, neuropathies, paraesthesia, or violation of the mandibular canal.

**13.3** High success rates for implants in the anterior edentulous jaw have been recorded with one implant system after a 10 year period. This goal should be recognised, while accepting that the outcome may differ for implants placed in other sites or involving bone grafts and with different implant systems. Caution is recommended in anticipating outcome when advising patients.

In the future, it is likely that the success rate will continue to improve. It is therefore suggested that the criteria for success be reviewed at regular intervals in the light of the results achieved.

## References


1 Cawood J I, Howell R A. A classification of the edentulous jaws. *Int J Oral Maxillofac Surg* 1988;1:232-236

2 Terry B C, Zarb G A. Report on 4th International Congress on Preprosthetic Surgery, Palm Springs, USA 1991. *Int J Oral*

3 Albrektsson T, Zarb G, Worthington P, Eriksson A R. The long-term efficacy of currently used dental implants: a review and proposed criteria of success. *Int J Oral*

# PROSTHETIC DENTISTRY GLOSSARY (Revision 1995)

**Produced by a working party from BSSPD and approved by the Council of BSSPD**

**R I NAIRN AND M M J SHAPIRO**

# Foreword

This glossary is a replacement for BS4492 (1983) which is no longer official, having been displaced by ISO 1942. Unfortunately the ISO1942 Dental Vocabulary is often unhelpful when the need arises to clarify the meaning of many of the terms which we use in prosthodontics.

We have made many changes to the definitions appearing in BS4492. Most are grammatical, and made in the cause of clarity. Some new terms have been added, following suggestions or selected from the "Glossary of Prosthetic Terms" produced by the Academy of Denture Prosthetics and published in the Journal of Prosthetic Dentistry of December 1987.

We have tried to avoid straying into the realm of the textbook by excluding descriptions of devices or procedures that are extensions of the basic conceptual term included in the Glossary. Where a term appears within a definition it is italicised to aid cross reference.

It must always be remembered that "What is the meaning of such and such a term?" is really the wrong question. The correct question is "What shall we call such a concept or object?" Where arguments arise they should be directed to the validity of the concept or the clear description of the object.

Robert Nairn
Monty Shapiro
October 1994

**Footnote 1995**

Sadly, Monty Shapiro died before this work could be published. Without him this would have been a poor thing. His scholarship and knowledge of languages was extraordinary. An accompanying text *in eleven languages* was in preparation but will have to remain incomplete. Preparing this English version with him was a delight and I hope it can be seen as a lasting memorial. He is greatly missed. RN

# PROSTHETIC DENTISTRY GLOSSARY

## A

**abrasion (dental)** Loss of tooth substance or of a restoration, caused by wear not due to tooth contact.

**abrasive** A substance used for abrading, grinding or preparing a surface for polishing.

**absorption** The taking up of fluids or other substances into the body of a material or tissue.

**abutment** A tooth, root, or superstructure of an implant used for the *support* or anchorage of a fixed or removable *dental prosthesis.*

**adhesion** The physical force that attracts certain dissimilar mole cules when in close approximation.

**adjustable articulator** An *articulator* that can be adjusted to accommodate records of positions or movements of the mandible.

**alar-tragal line** Camper's line A line passing through the inferior border of the ala of the nose and the superior border of the tragus of the ear. [This line is approximately parallel to the *occlusal plane* of the natural teeth]

**alginate** hydrocolloid impression material Irreversible hydrocolloid consisting of sols of alginic acid with a physical state that is changed by an irreversible chemical reaction to form an insoluble calcium alginate.

**altered cast** A master *cast* that is altered by partial replacement with a cast of an additional impression.

**alveolar ridge** residual ridge The remaining part of the bony process and the covering tissues which once supported the teeth.

**alveolectomy** Surgical reduction of the residual alveolar process.

**alveolotomy** The fracturing and moulding of the alveolar process following the removal of the septa.

**anatomical tooth** An artificial tooth with a crown form simulating that of a natural tooth.

**angular cheilitis** — Inflammation of the corners of the mouth. [Often occurs when the dentures fail to provide adequate lip support.]

**anodontia** — Total absence of the teeth due to developmental failure.

**arcon articulator** — An articulator in which the condylar analogue is carried on the mandibular element, and the condylar track on the maxillary component. [This contrasts with the common adjustable articulator, in which the condylar analogue is attached to the maxillary component and the track to the mandibular element]

**arrow-point tracing**
gothic arch tracing
needle-point tracing — A horizontal tracing, which resembles an arrowhead or a gothic arch, made by a tracing device. [This represents the posterior *border movement* of the mandible and its apex the most retruded position of the mandible.]

**articulation** — See *dental articulation.*

**articulator** — A hinged instrument, to which the maxillary and mandibular *casts* are attached, and which reproduces recorded relations of the mandible to the maxilla. [Certain articulators reproduce recorded movements of the mandible.] Articulators assist the study of *occlusion* and the formation of the *occlusal surfaces* of prostheses and restorations.

**attrition (dental)** — The loss by wear of tooth substance or of a restoration resulting from *mastication* or from contact between occluding or approximal surfaces.

**autopolymerizing acrylic resin**
self-cure acrylic resin — inaccurate: see cold curing acrylic resin

**average value articulator**
semi-adjustable articulator
(deprec) — An articulator with a fixed condylar guide angle.

## B

**backing** — A metal component covering the palatal or lingual surface of a *denture* tooth or artificial crown.

**balanced articulation** — Simultaneous contacts of the *occluding surfaces* of the teeth during function.

**balanced occlusion** — Simultaneous contacts of the *occluding surfaces* of the teeth in various jaw positions.

**balancing side** — See *non-working* side.

**bar connector** — A bar joining two or more parts of a *partial denture.*

**bar attachment** — A bar joining two or more teeth, roots or *implant superstructures* and supporting and retaining a denture.

**baseplate** — The temporary or permanent *denture* base on which an occlusal rim is built or on which a *trial denture is* set up.

**Bennett angle** — The angle between the sagittal plane and the path of the advancing condyle during lateral mandibular movement as viewed along the horizontalplane.
[BENNETT N G (1908) Proc. R. Soc. Med.1.1979]

**Bennett movement**
Lateral bodily shift — The lateral translation of the mandible during a *lateral excursion.*
[BENNETT N G (1908), Proc. R. Soc. Med. 1. 1979]

**Bonwill triangle** — A 4 inch (102 mm) equilateral triangle postulated by Bonwill. It isformed by the medial contact-point of the mandibular central incisors and the centres of the condyles. [BONWILL W G A (1899). Dent. Items Int. 21.617]

**border moulding**
muscle trimming (deprecated) — The shaping of the impression material by the manipulation or activity of the soft tissues adjacent to the borders of the *denture* bearing area.

**border movement** — A movement of the mandible along the extremity of its range, in any direction.

**border seal**
**peripheral seal** (deprecated) — The contact between the *denture* border and the adjacent tissues which prevents the passage of air.

**bounded saddle** — A *saddle* limited at each end by a natural tooth .

**boxing** (of an impression) — The provision of a wall, usually of wax, attached to the perimeter of an impression, to contain the *cast* material until it is set.

**bracing** — Resistance to horizontal components of force.

**bracing arm**
**lateral resisting arm** — A component of a partial *denture* used to resist lateral displacing forces.

**buccal** — Pertaining to or adjacent to the cheek.

## C

**Camper's line** — eponym - see alar-tragal line

**canine guidance** — The guidance provided during the movement of the mandibular canines over the palatal surfaces of the maxillary canines.

| | |
|---|---|
| **cast** (dental, oral or facial) | A reproduction of the surface form of oral or facial tissues obtained from an impression. |
| **cast** (verb) | To form a *cast* from an impression or to form a *casting* in a mould. |
| **casting** | An object, usually of metal, formed in a mould. |
| **casting ring** | A metal tube in which a refractory mould is made to cast metal restorations or appliances. |
| **central bearing device** | A device that provides a central point of bearing or support between the maxillary and mandibular arches. [Used in making intraoral or extraoral mandibular tracings] |
| **central bearing point** | The stylus of a *central bearing device.* |
| **centric jaw relation**<br>centric relation (deprec) | see *retruded jaw relation.* |
| **centric occlusion** | see *intercuspal occlusion.* |
| **check record**<br>check bite (deprecated) | An *interocclusal record* made to verify a previous interocclusal record. |
| **Christensen's phenomenon**<br>Christensen's cleft | A gap which appears between the posterior ends of opposing flat occlusal rims when the mandible is protruded. NOTE. Reference: CHRISTENSEN C. 'A rational *articulator',* Ash's Circular, 1901, pp 409-420. |
| **cingulum** | A bulbous convexity near the cervical margin of the crown of a tooth, typically found on the palatal or lingual surfaces of incisors and canines. |
| **circumferential clasp**<br>occlusally-approaching clasp | A *clasp* lying in contact with the surface of the tooth which originates on the occlusal side of the *survey line* and passes across it. |
| **clasp** | A metal arm that, when in contact with a tooth, retains and/or stabilizes a *partial denture.* |
| **cohesion** | The attraction of like molecules within a substance. |
| **cold curing acrylic resin** | An acrylic resin whose *polymerization is* initiated by a chemical activator without applying heat. |
| **compensating curves** | The curvatures of the *occlusal plane* of *dentures* created to compensate for the effects of *Christensen's phenomenon* |
| **complete denture** | A *denture* replacing the entire maxillary or mandibular *dentition* and the lost associated tissues. |
| **condylar path angle**<br>condylar angle (deprec) | The angle between the sagittal projection of the condylar path and the Frankfort plane. |

**condylar axis** Any line through either mandibular condyle, about which the mandible may rotate.

**condylar guide** That part of an articulator which guides its condylar element.
condylar track

**condylar guide angle** The angle of inclination of the *condylar guide* to the horizontal plane or other reference plane.
condylar track angle

**condylar path** Any path travelled by the mandibular condyle during the various mandibular movements.

**connector** A part of a partial *denture* that unites other components.

**coronal plane** Any plane passing through the body at right angles to the *sagittal* plane.
frontal plane

**curve of Monson** The curve of occlusion of natural teeth in which each cusp and incisal edge touches or conforms to a segment of the surface of a sphere 4 inches (102mm) in radius with its centre in the region of the glabella.

**curve of Spee** An arc of a circle of 65mm to 70mm radius that touches the tips of all the mandibular teeth when the skull is viewed laterally; when continued it touches the anterior surface of the condyles.

**cusp angle** The angle between the slope of the cusp and the horizontal plane. [According to this definition the higher the cusp angle the steeper the cusp].

## D

**deflective occlusal contact** A tooth-to-tooth contact that changes the direction of mandibular movement during closure.

**dental arch** The curved structure incorporating the *dentition* or the residual ridge.

**dental articulation** The contact relations between maxillary and mandibular teeth during jaw movement.

**dental bar** A major *connector* which lies on the lingual surfaces of the anterior teeth
**lingual dental connector**

**dental implant** An endosteal or subperiosteal implant used to support a crown, bridge or *denture.*

**dental prosthesis** An artificial replacement for one or more teeth and/or associated structures.

**dentate** Having natural teeth.

**dentition** — The natural teeth in the *dental arches.*

**denture** — A *removable dental prosthesis* replacing natural teeth and their associated tissues.

**denture adhesive** — A material used to improve the *denture retention* effect.

**denture base** — That part of the *denture* which rests on the *denture-bearing area* of the oral mucosa.

**denture-bearing area** — Those surfaces of the teeth and *edentulous* ridges covered by a denture

**denture border** — The periphery of the *denture base* lying at the limits of anatomical extension.

**denture retention** — Resistance of a *denture* to vertical movement away from the tissues.

**denture space** — A potential space in the mouth which the *denture* should occupy.

**denture stability** — The resistance of a *denture* to displacement by functional forces.

**diastema** (pl diastemas) — A space between two adjacent teeth in the same *dental* arch.

**direct retainer** — A component of a *partial denture* that resists dislodgement along the path of withdrawal.

**direct retention** — The *retention* of a *partial denture* by the use of *direct retainers.*

## E

**eccentric jaw relation** — see *lateral or protrusive jaw relation.*

**eccentric occlusion** — see *lateral or protrusive occlusion.*

**edentulous** — Without natural teeth.

**embrasure** — The space between two teeth which opens out from their contact point.

**endosteal implant**
endosseous implant — An implant, usually made of metal, which is inserted into bone. [An endosteal implant usually has three parts:
1. a **body** which is surgically placed in the bone.
2. an **abutment** which supports and/or retains the prosthesis or superstructure.
3. a **superstructure** to which other components are attached.]

**envelope of function** — The three-dimensional space contained within the envelope of motion that defines mandibular movement during masticatory function and/or speech.

**envelope of movement** — The three-dimensional space circumscribed by *border movements* of a given point of the mandible.

**extra-coronal attachment** — A *precision attachment* joined to a restoration and situated outside the coronal contour of an abutment tooth.

**extra-oral tracing** — An *arrow-point tracing* made on a *tracer,* part of which extends outside the mouth.

## F

**face-bow** — An instrument used to record the relation of the maxillae to the *hinge axis* of rotation of the mandible. [It enables a similar relation to be established between the maxillary *casts* and the *hinge axis* of the *articulator.]*

**facial seal** — The seal created by contact of the lips and cheeks with the *polished surface* of a *denture.*

**final impression**
master impression
working impression
second impression — The impression used for making the master *cast.*

**fit** (of a denture) — This word is commonly used to describe the adaptation of the *dentures* to the supporting tissues or to identify the stage at which the patient receives the *dentures.*

**fitting surface** — See *tissue* surface.

**fixed dental prosthesis** — A *dental prosthesis* which is attached to natural teeth, tooth roots or implants, and cannot be removed by the patient.

**flange** (denture) — That part of the *denture base* which covers the labial, *buccal* or lingual surfaces of the alveolar ridge and is limited by the sulcus reflection.

**flask** (denture) — (1) (noun). A sectional case that contains and supports the mould in which *dentures* are formed.
(2) (verb). To *invest* a *denture pattern* in a flask.

**foveae palatini**
foveae palati — Pits situated near the junction of hard and soft palates, usually one on either side of the mid-line.

**framework** (denture) — A metallic *partial denture* base to which other components are attached.

**Frankfort plane**
A plane passing through the lowest point in the margin of the left orbit (orbitale) and the highest point in the margin of each external auditory meatus (porion). [It approximates to the horizontal when the head is in a normal upright position].

**free articulation**
unobstructed articulation
*Articulation* that is unobstructed by cuspal interference.

**free-end saddle**
distal extension saddle
distal extension base
A *partial denture saddle* having no natural tooth distal to it.

**frenum (Lat n pl frena)**
A fibrous tissue band, covered by mucous membrane, which passes between the alveolar process and the lip, cheek or tongue.

**functional impression**
An impression modified by masticatory loads and adjacent muscular activity. [See also mucodisplacing impression.]

## G

**gerodontics**
The treatment of dental problems of aging persons.

**gingivally-approaching clasp**
bar clasp
Roach clasp
A *clasp* whose arm approaches a tooth from the direction of the gingivae.

**gnathodynamometer**
An instrument for measuring the force exerted in closing the jaws.

**gnathology**
The study of the functions of the jaws and related disorders.

**group function**
Multiple contacts between the maxillary and mandibular teeth on the *working side* during lateral movements.

**guiding planes**
Two or more parallel tooth surfaces which determine the *path of insertion* and withdrawal of a *partial denture.*

## H

**high lip-line**
The highest level which the margin of the upper lip achieves in function.

**hinge articulator**
plain-line articulator (deprec)
An articulator with a hinge joint and which permits only vertical movement.

**hinge axis**
A transverse axis about which the mandible can rotate without translatory movement of the condyles.

**hinge axis locator**
kinematic face-bow
adjustable axis face-bow
hinge bow
A device, with adjustable side arms, which is attached to the mandible and used to locate the retruded *hinge axis.*

**hinge movement**
An opening or closing movement of the mandible about the *hinge axis.*

**horizontal overlap**
overjet
A *buccal* or labial projection of the maxillary teeth beyond the mandibular teeth.

**hypodontia**
oligodontia
partial anodontia (deprec)
Absence of some teeth.

## I

**immediate replacement denture**
A *denture* fitted immediately after the removal of natural teeth.

**implant denture**
A *denture* that is fitted to an *implant denture* superstructure.

**implant abutment**
*see endosteal implant*

**implant body** implant fixture
*see endosteal implant*

**implant superstructure**
*see endosteal implant*

**impression**
A negative imprint from which a positive reproduction, or *cast,* can be made.

**impression compound**
A thermoplastic *impression* material.

**impression surface**
See *tissue surface.*

**impression tray**
A metal or plastic receptacle used to transport, control, and support an *impression* material.

**incisal angle**
The angle formed with the horizontal plane by the line between the incisal edges of the maxillary and mandibular central incisors when the teeth are in *intercuspal* occlusion.

**incisal guidance**
The guidance provided by the surfaces of the maxillary incisors in lateral and protrusive movements of the mandible.

**incisal guide incisal table**
That part of an *articulator* which maintains the *incisal* angle.

**incisal guide angle**
*The angle to which the incisal guide is* set.

**indirect retention**
The *retention* obtained by the extension of a *partial denture* base to provide the fulcrum of a class II lever. [The *retainer(s)* providing *direct retention* lie between the fulcrum and that part of the *denture* which is subject to the displacing force]

**infra-orbital pointer**
infraorbital indicator
The component of a *face-bow* that records the infra orbital margin and thereby aligns it with the Frankfort plane.

**initial contact**
The first meeting of *occluding surfaces.*

**interalveolar distance**
inter-ridge distance
The vertical distance between specified positions on the maxillary and mandibular alveolar ridges at the *occlusal vertical dimension.*

**intercondylar axis**
The line joining the rotational centres of the condyles.

**intercuspal occlusion**
maximum intercuspation
centric occlusion
Maximal contact between opposing teeth.

**intercuspal position**
tooth position (deprec)
The position of the mandible when the teeth are in *intercuspal occlusion.*

**intercuspation**
The interdigitation of cusps of opposing teeth

**interocclusal**
Between opposing *occlusal surfaces.*

**interocclusal clearance**
freeway space
The space between the maxillary and mandibular *occlusal surfaces* when the mandible is in the *rest position.*

**interocclusal record**
A record of a specified relation of opposing *occlusal surfaces.* [The records may be intercuspal, retrusive, protrusive, lateral, and either contact or pre-contact.]

**infra-coronal attachment**
A *precision attachment,* one part of which is totally embedded in a restoration.

**infra-oral tracing**
A tracing made within the oral cavity, usually by a *central bearing device.*

**invest**
To surround or embed in an investment material.

## J

**jaw relation**
A relation of the mandible to the maxilla.

## K

**Kennedy bar**
continuous clasp (deprec)
A narrow bar lying in contact with the lingual surfaces of the teeth and occlusally to the cingula. [This may provide *indirect retention* for a ***partial*** *denture*.]

## L

**labial bar**
A *major connector* of a *partial denture* which is placed between the gingival margin and the reflection of the labial sulcus

**lateral excursion**
A lateral movement of the mandible with the opposing teeth in contact.

**lateral interocclusal record** An interocclusal record made with the mandible in a lateral position.

**lateral or protrusive jaw relation** Any jaw *relation* that is lateral or protrusive to the retruded *jaw relation.*

**lateral or protrusive occlusion** Any *occlusion* that is not the *intercuspal* occlusion.

**lingual bar** A major *connector* of a mandibular partial *denture* which is placed between the gingival margin and the floor of the mouth.

**lingual plate** A major connector of a partial *denture* which covers part of the lingual surfaces of the crowns of the lower anterior teeth and the lingual gingival tissues.

**lingual rest** A rest placed on the lingual surface of an anterior tooth.

**lip line** A line denoting the position of the upper lip margin.

## M

**major connector** A plate or bar which unites partial *denture saddles.*

**mandibular lateral translation** The non-rotational component of lateral mandibular movement.

**marginal ridge** A ridge situated at the mesial or distal border of the occlusal surface of a premolar or molar tooth. It may be found on the lingual surface of an anterior tooth.

**master cast** A *cast* produced from a *final* impression.

**mastication** Chewing.

**masticatory system** The oral structures engaged in mastication.

**matrix** 1. The female component of a precision attachment.

2. An overcast.

**minor connector** The connecting component between the major connector or base of a partial *denture* and other units, such as clasps and rests.

**model** A positive likeness, at any scale, of some form. [The word model should not be used as a synonym for a dental cast]

**modiolus** The decussation of facial muscles distal to the corners of the mouth. [It stabilizes the cheeks and lips during oral function. Reference: LIGHTOLLER(1925) J.Anat.110, pp 1-85.]

**mould** A form in which an object is cast or shaped.

**mount** (a cast) — To attach a cast to an articulator.

**Mounting** (of a cast) — The means of attachment of a cast to an articulator.

**mouth guard** — An appliance worn to protect the teeth from injury arising from an impact.

**mucodisplacing impression** — An *impression* made with the intention of displacing soft tissues under the *denture-base.* [See also *functional impression.]*
mucocompressive impression (deprec)

**mucostatic impression** — An *impression* made with the intention of minimizing mucosal displacement

## N

**neutral zone** — A zone in which the forces of the cheeks and lips are said to be in equilibrium with those of the tongue.

**non-anatomic tooth** — A prosthetic posterior tooth whose main features do not correspond to human dental anatomy.
cuspless tooth
inverted cusp tooth
zero-degree tooth

**non-working side** — The side opposite to the *working side.*
**balancing side**
**contralateral side**

**non-working side contacts** — The contacts between maxillary and mandibular teeth or *denture bases* on the *non-working side,* or posteriorly in a protrusive occlusion.
balancing contacts

**obturator (dental)** — A *dental prosthesis,* or part of a *dental prosthesis,* used to close a congenital or acquired opening.

**occlude** — To bring the mandibular and maxillary teeth into contact.

**occluding surfaces** — Those surfaces of the teeth, or tooth substitutes, which make contact with those in the opposing jaw. [See also *occlusal surfaces.]*

**occlusal analysis** — The examination of the contacts of opposing teeth.

**occlusal correction** — The improvement of occlusal contacts.
occlusal adjustment
occlusal equilibration

**occlusal interference** — An undesirable contact between opposing teeth.

**occlusal overlay** — An appliance, or part of an appliance, that covers the occlusal surfaces of the teeth.
bite guard (deprec)

bite raising appliance (deprec)

**occlusal path** — The path of movement of one *occluding surface* over the other.

**occlusal pivot** — An elevation artificially developed on the *occlusal surface,* usually in the molar region.

**occlusal plane**
plane of occlusion — A common plane established by the incisal edges and *occlusal surfaces* of the teeth. [This is usually curved and is therefore not strictly a plane]

**occlusal rest** — See *rest.*

**occlusal surfaces** — The surfaces of molar or premolar teeth which would normally *occlude* with an opposing tooth.

**occlusal table** — The *occlusal surfaces* and incisal edges of the *dental arch.*

**occlusal vertical dimension**
occlusal face height — Any *vertical dimension* with the teeth or occlusal rims in contact.

**occlusion** — Any contact between teeth of opposing *dental arches.*

**occlusion rim**
bite block (deprec)
bite rim (deprec) — Mouldable material attached to a temporary or permanent *denture base* for the purpose of recording *jaw relations* and indicating tooth positions.

**onlay** — A metal *casting* which covers and is fixed to the entire occlusal surface of a tooth.

**open bite**
incomplete occlusion — (1) A failure of some opposing teeth to *occlude* when the other teeth are in *intercuspal occlusion.*
*(2)* (deprec) An *occlusal vertical dimension* that is too large.

**overclosure** (deprec) — An *occlusal vertical dimension* that is too small.

**reduced occlusal vertical dimension**

**osseointegrated implant** — An implant with direct connection between its surface and host bone.

**overcast** — A plaster covering applied to a dental *cast.*

**overdenture** — A *denture* the base of which covers one or more teeth, prepared roots or implants.

**overlay** — A metal or acrylic covering on the *occlusal surfaces* or incisal edges of natural teeth.

**overlay denture**
bite raising appliance (deprec) — A *denture* or appliance incorporating an *overlay.*

## P

**packing** (denture) — Filling a mould with a plastic material in order to construct a *dental prosthesis.*

**palatal bar** — A major *connector* of a maxillary partial denture frame work.

**pantograph** (oral) — A set of tracing devices attached to the mandible and maxilla which records mandibular movements in three planes.

**partial denture** — A *denture* provided for a dental arch in which some, but not all, natural teeth are missing.

**partial denture saddle** — That part of the base of a partial *denture* which rests on, or covers, the *edentulous* ridge.

**path of insertion** — The path followed by a *denture* from its first contact with the teeth or soft tissues until it is fully seated. [The path of withdrawal is the converse of this.]

**patrix** — The male component of a *precision attachment.*

**pattern** — A form used to make a mould.

**pear-shaped pad** — The most distal portion of attached keratinized mucosa overlying the crest of the mandibular ridge at the extraction site of the third molar and situated anterior to the retromolar pad.

**piezograph** (oral) — A form moulded in a plastic material by the tongue, lips and cheeks. [It is intended to represent the minimum pressure zone in *edentulous* areas.]

**polished surface** — A surface of the *denture,* usually polished, which is in contact with the lips, cheeks or tongue.

**polymerization** — The joining of molecules of small molecular weights into a compound of large molecular weights.

**posterior palatal seal** — The seal developed at the posterior border of a maxillary denture.

**post dam** — A ridge of *denture base* material on the posterior border of the maxillary denture impression surface. [It usually displaces the supporting soft tissues in order to create a seal.]

**precision attachment** — An interlocking device, one component of which is fixed to an abutment, while the other is incorporated into a *denture* or bridge.

**prefabricated attachment** — A manufactured precision *attachment.*

**premature contact** — An undesirable occlusal contact prior to intercuspal occlusion. [See also initial contact.]

**primary impression**
preliminary impression
first impression — An impression made for treatment planning or the construction of an *impression* tray.

**process** (verb) cure — To polymerize denture base resin in a mould.

**procline** — To tilt anterior teeth labially

**prosthesis** — An artificial replacement of a part of the human body.

**prosthodontics**
prosthetic dentistry — That part of restorative dentistry concerned with removable prostheses. [The exact definition of this term in the U.K. dif fers from that generally accepted elsewhere in Europe. This is given by the International Dental Federation/ International Organization for Standardization (FD1/ISO) definition, as `That branch of dentistry which is concerned with the functional and aesthetic rehabilitation of the *masti catory system* by artificial replacement of missing teeth and associated tissues.']

**prosthodontist**
**dental prosthetist** — A dentist engaged in the practice of *prosthodontics.*

**protrusive interocclusal record** — An *interocclusal record* made with the mandible in a protruded position.

**protrusive record** — A record of a protruded relation of the mandible to the maxilla.

**provisional denture** — A *dental prosthesis* to be used for a short time prior to the construction of a definitive replacement.

## R

**rebase** — The partial or complete removal and replacement of the *denture base.*

**reciprocal arm** — A component of a ***partial denture*** used to oppose forces applied to a tooth by a *direct retainer.*

**relief area** — 1. An area on the *cast* on which a spacer is placed to provide relief of the *denture base* from the underlying mucosa.
2. A recess in the *fitting surface* of a *denture base.*

**reline** — The addition of material to the fitting surface of a denture base.

**removable dental prosthesis** — A *dental prosthesis* which can be removed by the patient.

**rest** — (1) A component of a *partial denture* used to support the *framework* against vertical load. [Specific types are occlusal, incisal and *cingulum* rests]
(2) A state of physiological relaxation. [See also rest position.]

| | |
|---|---|
| **rest jaw relation** | The relation of the mandible to the maxilla when the mandible is in the rest position. |
| **rest position** (of the mandible) | The position that the mandible passively assumes when the mandibular musculature is relaxed and the patient is upright. |
| **rest seat** | A portion of a tooth that has been prepared to receive a rest. |
| **rest vertical dimension**<br>resting face height | The vertical *dimension* with the mandible in the rest position. |
| **retainer** | A component of a partial *denture* that uses a natural tooth to secure the *denture* against dislodgement. |
| **retention** | See *denture retention.* |
| **retentive arm** | A flexible component that engages an *undercut* on a tooth to retain a *denture.* |
| **retrocline** | To tilt an anterior tooth palatally or lingually. |
| **retromolar pad** | A mass of glandular tissue, covered by non-keratinised epithelium, situated on the mandible posterior to the third molars. |
| **retromylohyoid fossa** | A fossa on the lateral wall of the lingual sulcus posterior to the mylohyoid muscle. |
| **retruded arc of closure** | The arc described by any point on the mandible during a closing movement made with the condyles in their most posterior positions. |
| **retruded contact position**<br>ligamentous position | The position of the mandible on the *retruded* arc of closure when tooth contact first occurs. |
| **retruded jaw relation**<br>centric jaw relation<br>centric relation | The relation of the mandible to the maxilla with the mandible in its most retruded position. |
| **reverse curve**<br>anti-Monson curve | A curve of the occlusal *surfaces* of the posterior teeth that is convex upwards in the coronal *plane.* |
| **reverse horizontal overlap** | A buccal or labial projection of the mandibular teeth beyond the maxillary teeth. |
| **reverse occlusion**<br>cross bite (deprec) | An occlusal relationship of the posterior teeth with a reverse *horizontal* overlap. |
| **ridge augmentation** | A procedure for increasing the size of an atrophic ridge by means of alloplastic or bone grafts. |

## S

**saddle** denture saddle — See *partial denture saddle*

**sagittal plane** — An antero-posterior plane generally in, or parallel to, the median plane of the body.

**sectional denture** — A *denture* consisting of two or more partially or separable sections.

**sectional impression** — An *impression* that is made in segments.

**selective grinding**
spot grinding
grinding in(deprec) — The planned adjustment of the occlusal forms of teeth grinding.

**silicone impression material** — An impression material based on an organo-siloxane polymer, in which silicon-oxygen links form the basic structure.

**skeleton denture** (deprec) — A unacceptable synonym for a *partial denture* with a metal base.

**split mounting** — A method of attaching the *cast* to an *articulator so* that it can be separated from the mounting material.

**stability** — See *denture stability*

**stress breaker** — A device intended to relieve abutment teeth of load.

**stud attachment** — An attachment having a stud-shaped *patrix.*

**study cast** — A *cast* used as an aid to diagnosis and treatment planning.

**sub-lingual bar** — A *major connector* which is placed on the floor of the mouth, occupying the functional width and depth of the sulcus.

**subperiosteal implant**
substructure — A metal *framework* that lies in contact with bone and beneath the periosteum.

**support** denture support — A term used to describe the resistance of a *denture* to occlusally-directed loads.

**survey** — The procedure carried out on a *surveyor* to determine *guiding planes* and mark the *survey line.*

**survey line** — The line on a *cast* indicating the maximum convexity of tooth or the alveolar process in relation to a planned *of insertion.*

**survey path** — The direction of the *surveyor* rod in relation to the *cast* orientation.

**surveyor** — An instrument used to *survey casts.* [It may also be used to prepare parallel surfaces on restorations]

## T

**tissue-borne** — Supported by the *edentulous* alveolar ridge.

**tissue conditioning material** — A temporary denture lining material intended to assist the return of denture-bearing tissues to their normal condition.

**tissue surface**
impression surface — The surface of the *denture* which is in contact with the *denture-bearing area.*

**tooth-borne** — Supported by teeth.

**tracer** — A device with a marking point attached to one jaw and a tracing plate attached to the other. [It is used to record jaw positions or movements]

**transitional denture** — A *partial denture* that is progressively enlarged by adding replacements for extracted teeth until it becomes a com-*plete denture.*

**trial denture**
trial insertion
try-in (deprec)
setup(deprec) — The arrangement of teeth in wax for trial prior to completion of the *denture.*

## U

**undercut**
infra-bulge (deprec) — That area of a tooth or soft tissue surface which is beyond the *survey line* when viewed along the *survey path.*

## V

**vertical dimension**
(of the face) — A measurement of the face made between any two selected points, one above and one below the mouth, usually in the mid-line.

**vertical overlap**
**overbite** — The extension of the maxillary teeth over the mandibular teeth in a vertical direction when the opposing teeth are in the *intercuspal position.*

**vibrating line** — The line of junction between the moving tissues of the soft palate and the static tissues anterior to them.

## W

**wax wafer** — A strip of wax used in making *interocclusal records.*

**wear facet** — A shiny surface on a tooth produced by moving contact between tooth surfaces.

**Willis gauge** A device for measuring dimensions of the face.

**working side** ipsilateral side The side towards which the mandible moves in a lateral movement.

**working side contacts** The contacts between maxillary and mandibular teeth or *denture bases* on the *working side,* or anteriorly in a protrusive occlusion

## XYZ

**zinc oxide-eugenol** impression paste A rigid-setting impression material mixed with two pastes: one contains zinc oxide together with an oil, such as liquid paraffin; the other comprises a resin such as colophony dissolved in eugenol.