

A Definition of Prosthetic Dentistry

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Purpose: A more precise and up-to-date definition of prosthetic dentistry is warranted. The aim of the present review is to present a new core definition of the discipline on the basis of a discussion of existing definitions. **Materials and Methods:** Clinical textbooks in prosthetic dentistry and dental implantology, as well as medical and dental glossaries were reviewed. **Results:** Two main categories of definitions of prosthetic dentistry were identified: first, definitions that emphasized the technologic aspects of the discipline, ie, the fabrication of prostheses; and second, definitions that incorporated some reference to the objectives or aims of prosthetic treatment, ie, the restoration of one or more aspects of oral function. Slightly more than half of the citations contained such aim-related references, and this aspect tended to be most pronounced in recent publications.

Conclusion: The following definition is ventured: prosthodontics is the discipline of dentistry concerned with the consequences of congenital absence or acquired loss of oral tissues and with the methods for and assessment whether more good than harm is done by inserting artificial devices made from alloplastic materials. *Int J Prosthodont* 1998;11:295–301.

An updated register of scientific research originating from the prosthodontic departments of Scandinavian dental schools has recently been introduced on the Internet (<http://www.odont.uio.no/prosthodont/sspd.htm>). An evaluation of this material revealed that much activity had been focused on subjects that could hardly be labeled as prosthodontic research in a narrow sense of the term. One could of course define *prosthodontic research* pragmatically as research carried out in prosthodontic departments. On the other hand, the organization

of clinical departments in dental schools is primarily the result of historic, logistic, academic, and economic factors and restraints. As a result, the scope of borderline disciplines will vary among clinical departments. Accordingly, such a pragmatic definition of prosthodontic research will necessarily be rather vague and does not answer the question, "is there a common core?"

A review of several clinical textbooks and glossaries indicated a wide spectrum of definitions of the discipline of prosthetic dentistry. The majority of these definitions emphasize the discipline as a provision of a technology rather than a form of therapy. This reflects the outdated technocratic view of patient care as proposed in the Flexner reports early in this century¹ that has frequently been questioned by medical practitioners and scientists.² Finally, the various definitions reflect a semantic incoherence, and few definitions include terms used in current biomaterials science.

Prosthodontists experience the need for the exchange of specialized knowledge in a combined operation with other fields of clinical dentistry. It is therefore essential that the dental community have

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Table 1 Definitions of Prosthetic Dentistry Primarily Focusing on the Technologic Aspects of the Discipline

Definition	Reference	Year
Dental prosthetics Deals with the replacement of tissues of or pertaining to the masticatory apparatus	Turner ³	1907
Dental prosthetics That branch of dental science which treats the various methods of providing suitable substitutes for the lost organs of the mouth in whole or in part, the artistic and mechanical processes involved in such restoration, together with a description of the physical properties and peculiarities of the various materials employed.	Schlosser ⁴	1939
Dental prosthetics, prosthodontics, prosthetic dentistry Subdivision which deals with its application to the mouth. It includes the replacement of any lost tissue and therefore embraces the filling of teeth and fitting of artificial crowns. In actual practice, however, the term has come to mean the fitting of appliances such as artificial dentures, bridges, obturators, and surgical prostheses.	Fenn et al, ⁵ eds 1 and 2; MacGregor, ⁶ ed 3	1953 1989
Prosthodontics The division of the science and art of dentistry concerned with the replacement of missing oral structures.	Dykema et al ⁷	1969
Prosthodontics, prosthetics That branch of dentistry concerned with the design, construction, making, insertion, and maintenance of artificial appliances intended to replace one or more teeth and associated tissues.	FDI, Federation Dentaire Internationale ⁸	1984
Dental prosthetics Branch of dental science dealing with the artificial replacement of one or more natural teeth or associated structures by a denture or bridge.	Harty ⁹	1994
Prosthodontics Branch of dental science concerned with removable dental prostheses. This definition is applicable to UK only.		
Prosthodontics The branch of dental art or science that treats specifically the replacement of missing dental and oral tissues.	Henderson and Steffel, ¹⁰ eds 3 to 8	1969 to 1994
Prosthodontics A discipline of dentistry concerned primarily with the replacement of lost dental parts.	Manhold and Balbo ¹¹	1985
Prosthodontics, prosthetic dentistry Branch of dentistry dealing with construction of artificial appliances for the mouth. A prosthodontist is a dentist who specializes in the mechanics of making and fitting artificial teeth.	Thomas ¹²	1997
Prosthodontic dentistry Replacing defective or missing teeth through the use of artificial appliances such as bridges, crowns, and dentures.		

a clear understanding of what the discipline of prosthetic dentistry includes. A more precise and up-to-date definition of prosthetic dentistry is warranted. The aim of this report is to present a new core definition of the discipline on the basis of a review of existing definitions.

Materials and Methods

Clinical textbooks in prosthetic dentistry and dental implantology, as well as medical and dental glossaries, were reviewed. All publications were in English and were printed in this century. The terms *prosthetic dentistry*, *dental prosthetics*, *prosthodontics*, and *prosthodontia* were regarded as analogous and their definitions were recorded. In contrast, various definitions of maxillofacial prosthetics and implant prosthetics were not recorded.

The definitions were sorted into groups on the basis of the formulation and content of the defini-

tion. An evaluation of the various definitions was then undertaken.

Based on the review a new definition of the discipline of prosthetic dentistry was constructed.

Results

Two main categories of definitions of prosthetic dentistry were identified: (1) definitions that emphasized the technologic aspects of the discipline, ie, the fabrication of prostheses (Table 1); and (2) definitions that incorporated some reference to the objectives or aims of prosthetic treatment, ie, the restoration of one or more aspects of oral function (Table 2). Slightly more than half of the citations contained such aim-related references, and this aspect tended to be more pronounced in recent publications.

The definitions from the *Glossary of Prosthodontic Terms* (GPT)¹³⁻¹⁵ and from the American Dental Association (ADA)²⁰ were frequently used

Table 2 Definitions of Prosthetic Dentistry Described in Textbooks and Glossaries Incorporating Functional Aspects of the Discipline

Definition	Reference	Year
Prosthodontics, prosthetic dentistry, prosthodontia That branch of dental art and science pertaining to the restoration and maintenance of oral function by the replacement of missing teeth and structures with/by artificial devices.	Glossary of Prosthodontic Terms, ¹³ eds 1 to 4 (Acad Denture Prosthetics)	1956, 1960, 1967, 1977
Prosthodontics, prosthetic dentistry The branch of dentistry pertaining to the restoration and maintenance of oral function, comfort, appearance, and health of the patient by the restoration of natural teeth and/or the replacement of missing teeth and contiguous oral and maxillofacial tissues with artificial substitutes.	Glossary, ed 5 ¹⁴ (Acad Denture Prosthetics) Glossary, ed 6 ¹⁵ (Acad Prosthodontics) McGivney and Castleberry ¹⁶	1987 1994 1995
Prosthodontics, prosthetic dentistry, dental prosthetics That branch of dentistry pertaining to the restoration and maintenance of oral function, comfort, appearance, and health of the patient by the restoration/replacement of natural/missing teeth and contiguous tissues with artificial substitutes.	Jablonski ¹⁷ Boucher's ed 4 ¹⁸ Dorland's Medical Dictionary, ed 28 ¹⁹	1992 1993 1994
Prosthodontics, prosthetic dentistry, dental prosthetics The science or/and art of providing suitable substitutes for the coronal portions of teeth, or for one or more lost or missing/natural teeth and their associated parts, in order that (impaired) function, appearance, comfort, and health of the patient may be restored.	Denton GB (American Dental Association) ²⁰ Boucher's, ed 1 ²¹ Stedman's Medical Dictionary, ed 26 ²²	1958 1963 1995
Prosthodontics, prosthetics That branch of dentistry which is concerned with the functional and aesthetic rehabilitation of the masticatory system by artificial replacement of missing teeth and associated tissues.	International Organization for Standardization (ISO) ²³	1983
Prosthetic dentistry The discipline in dentistry concerning itself with the diagnosis, prevention, and treatment of problems caused by tooth loss, with the aim of maintaining a functional dentition for life.	Öwall et al ²⁴	1996

in various clinical textbooks on fixed and removable prosthodontics. None of the other definitions of prosthetic dentistry/prosthodontics were used in more than one textbook. Interestingly, the ADA definition appeared also in Boucher's first edition in 1963²¹ and in some of the earliest editions of GPT,¹³ but was excluded in later editions. Similarly, the ADA definition²⁰ could not be identified in any other clinical textbooks or dictionaries, except in the Steadman's Medical Dictionary,²² where it has remained in the various editions.

Some key terms prevailed in the definitions of the prosthesis itself. Three definitions used the word *replacement* only, without further describing the type of substance to be used for the replacement. The term *suitable substitute* was recorded in one instance, whereas the term *artificial*, ie, "not natural, made in imitation of something natural," was recorded in 12 definitions in combination with other terms. None of the definitions included any reference to the use of alloplasts or other terms used in current biomaterials science.

Discussion

The ultimate reason for even considering prosthodontic therapy is the absence or lack of hard and

soft oral tissues. It would therefore seem logical that a large part of prosthodontic research would be concerned with the consequences of absence or lack of oral tissues on, for example, appearance, stomatognathic function, comfort and social well-being, and the local and general health of the patient. This assumption is supported by a review of the dental literature, which shows that the research focusing on such questions is generated mainly by investigators working in prosthetic dentistry departments. However, these aspects are seldom included in definitions of the discipline of prosthetic dentistry. Only one definition has been identified that includes these research topics as part of the discipline by including the statement "concerning itself with the diagnosis . . . of problems caused by tooth loss. . . ."²⁴

The definition suggested by Öwall et al²⁴ appears to be the most up-to-date and precise (Table 2). However, the definition refers to "problems caused by tooth loss." This is inaccurate because problems and functional impairment related to congenital disorders are not uncommonly encountered in the prosthodontic clinic. Another terminology problem arises from this distinction. Prosthetic treatment after acquired tooth loss in most cases aims to *rehabilitate, restore, replace, or substitute* something that

has been previously present. In contrast, prosthetic therapy for patients with congenitally absent tissues aims to habilitate, ie, to enable the patient to perform activities or expose structures previously absent. The distinction between congenital absence and acquired loss is of clinical importance because seemingly similar defects may present very different therapeutic challenges. Both aspects should therefore be referred to in the definition, viewed in the light of adaptation processes paramount for the success or failure of prosthetic treatment. Another argument for not using the term *rehabilitation* is that this term is not specific to prosthetic treatment. Rehabilitation may include any dental treatment program and thus involve all disciplines of clinical dentistry, ie, anything from the placement of a single restoration to a complete maxillofacial reconstruction by means of orthodontic, surgical, and extensive prosthetic therapy.

In 1961, Krogh-Poulsen²⁵ published a textbook in prosthetic dentistry in which he emphasized that the central issue of prosthetic treatment was not to reconstruct an impaired morphology of the dental arches, but to look upon the masticatory system as a functional unit. Accordingly, the author advocated that indications for prosthetic treatment were present when the masticatory system could not adequately adapt to the loss of oral tissues, and that the aim of applying prosthodontic therapy was to reconstitute the function of the masticatory system.²⁵ This close relationship between oral physiology, occlusion in the broad sense, and prosthodontic concepts is still reflected in the organization of departments in many dental schools. Some of the hypothetical associations between occlusion and oral dysfunction from Krogh-Poulsen's textbook are considered invalid today.²⁶ Nevertheless, the textbook was one of the first to suggest that the indications for and treatment goals of prosthetic treatment should be determined by the patient's functional status and needs, rather than by the absence of morphologic integrity of the dental arches.

The first edition of the GPT (1956)¹³ included a definition of prosthodontics that links the discipline to "oral function" (Table 2). A review of the prosthodontic literature from that period reflects that limited research had been carried out to elucidate this association. Seemingly, the reference to "oral function" reflected the traditional concept that the replacement of all missing teeth was considered a prerequisite for achieving adequate functional operations of the masticatory system.^{27,28} The original definition has been changed several times, with major modifications made in the fifth edition in 1987¹⁴ (Table 2). The term *device* (something contrived for a specific pur-

pose) was replaced by *substitute*. In addition, "comfort, appearance and health of the patient" was added in context with "oral function." These modifications reflect a change of focus from the technological fabrication of the prostheses toward more therapeutic aspects of prosthodontic treatment.

However, the later versions of the GPT definition include aspects of prosthetic work that may seem questionable as core parts of prosthetic dentistry that distinguish it from borderline disciplines. Thus, the introduction of "oral and maxillofacial" next to "tissues" might be regarded by some as crossing the line between dentistry and medicine. Also the inclusion of "the restoration of natural teeth" appears to present difficulties as it confuses rather than clarifies a distinction between prosthetic and restorative dentistry.

It seems that for many years prosthetic dentistry has been considered more as a discipline of dentistry that concentrated on providing a technology rather than on providing a therapy. That is, prosthetic dentistry is the provision of foreign objects that, when constructed according to a number of criteria, could be accommodated in the oral cavity, and which the patient could more or less adapt to. There are probably several explanations for this situation. Historically, "goldsmith dentistry" is a comparatively recent discipline of the health sciences, with two historic roots: medicine and handicraft. The actual making and fitting of tooth substitutes (prostheses) seem to originate from the latter. For many years the prosthodontic literature focused on how to optimize the technology, ie, to design and fabricate the prostheses. Less attention was paid to the treatment itself or to the treatment outcome, ie, the therapeutic effects. Obviously, the therapeutic outcome of a prosthodontic treatment may only be evaluated after the prosthesis has been installed in the mouth. Only then may any short- or long-term benefits derived from its fabrication and use be appraised. The outcome of prosthetic treatment is not only the result of the technical quality of the end product, but also of the biologic, psychologic, and preventive factors and how these factors are integrated in the anamnestic, diagnostic, and postoperative phases of the therapy. Most dentists would agree that the *raison d'être* for any prosthetic treatment is how it will help the patients cope with the deficiencies or absence of teeth and/or adjacent structures. It therefore seems peculiar that so many definitions of prosthetic dentistry have omitted any references to what prosthodontists wish to accomplish by fabricating these "artificial substitutes." It seems appropriate to describe a prosthodontist as a dentist who has special qualifications that enable

him or her to distinguish the optimal treatment for the patient among many treatment modalities on the basis of a correct diagnosis and other relevant factors. The contrast is a dentist who is capable of creating, for example, 137 different and sometimes exquisite technical solutions but who cannot perceive the short- and long-term benefits and outcomes of the various prosthodontic treatment alternatives. In the authors' opinion, this way of reasoning should also be reflected by the definition of the discipline prosthetic dentistry.

The notion of many years that prosthodontic treatment seems to have been regarded as a procurement of technology rather than therapy is also reflected by the subdivision of some dental schools into various departments. In medical hospitals the organization of units reflects the patient's particular type of illness or the anatomic location of the affected body organ, eg, internal medicine, ophthalmology, ear-nose-throat, etc. Units in dental schools are seldom organized according to this principle. In contrast, several dental schools have organized their clinics on the basis of the technical treatment modality provided, eg, separate departments for fixed, removable, and implant-based prostheses. Hopefully, the patients in these schools are scrupulously diagnosed and their treatment needs evaluated on a general level before referral to such departments. If the aim of prosthetic dentistry is to improve the patient's oral function, the inherent risk of losing sight of this goal by defining and organizing the discipline according to the technical approach seems obvious.

An implant is "a biomaterial or device made of one or more biomaterials, biologic or alloplastic, that is surgically inserted into soft or hard tissues to be used for functional or cosmetic purposes."²⁹ Another definition of an implant is "any device which is intended to be totally introduced into the human body . . . by surgical intervention which is intended to remain in place after the procedure."³⁰ However, an alloplast (an inert foreign body used for implantation within tissue¹⁵) introduced into living tissue is by itself nothing but a prosthesis. Therefore, a term such as *prosthetic implant* is meaningless.

From a medicolegal point of view, introducing something into the mouth is analogous to introducing something into the human body. From this viewpoint it can be argued that dentists have always "implanted" alloplastic materials into the oral cavity. Moreover, filling materials placed in oral tissues such as enamel, dentin, pulp, and oral mucosa can be characterized as "implants," although some regard it practical to limit the term *implant* to biomaterials inserted into jawbone. Most if not all materials used in dentistry are alloplasts, and the differ-

ence between an implant and other biomaterials placed by dentists into the oral cavity can be questioned. Today, several biomaterials are being placed both into and onto the jaw, under or over the periosteum, to augment or reform the jaw shape and improve the local conditions (bone substitutes, osseosynthesis devices, guided tissue regeneration, etc). Furthermore, the distinction between inert and noninert materials is obscure, and may even be modified by variations in the surface treatment of the materials. The only totally inert material available is, perhaps, diamond. There is considerable discussion, at least in Europe, related to definitions and use of terms such as *biocompatibility*, *bioactivity*, *inertness*, *bioacceptability*, and *biofunctionality*. Thus, the precision and exact meaning of the term *implant* is unclear.

Implant prosthetics is defined in the glossary of the American Academy of Implant Dentistry as "that portion of implant dentistry that concerns itself with the construction and placement of a fixed or removable prosthesis on any implant device."^{15,30} The definition is a mere description of a technical solution with the focus on the traditional alternatives, fixed or removable, applied in combination with a specific third technical means: the implant. This glossary also defines the terms *implant dentistry*, *dental implantology*, and *oral implantology* as "that area of dentistry concerned with the diagnosis, design and insertion of implant devices and restorations which provide adequate function, comfort and esthetics for the edentulous or partially edentulous patient."³⁰ It is not surprising that the definition could have been applied to define prosthetic dentistry if *implant* was substituted by *prosthetic*. However, this definition narrows the description of the "discipline" to the procurement of a technical solution to solve patients' problems. As discussed in the previous section, it is improper to define a discipline of dentistry according to particular technical treatment solutions that are being used. The term *implant prosthetics* should be regarded as a technical term for fabricating a specific type of prosthesis, in line with the terms *fixed* and *removable dental prosthetics*. One can seriously question whether implant dentistry should be regarded as a separate discipline in dentistry at all. The only difference between implant dentistry and prosthetic dentistry is that one specific technical alternative is advocated in the former, ie, the support and/or retention for the prosthesis is derived from implants rather than from teeth or muscular and physical forces.

Maxillofacial prosthetics has been defined as "that branch of dentistry which provides prostheses or devices to treat or restore tissues of the stomatognathic system and associated facial structures that

have been affected by disease, injury, surgery, or congenital absence, to provide all possible function and esthetics."²² This definition differs from the definition of dental prosthetics by widening the scope of tissues and structures to be considered for prosthetic treatment. The aim is similar to prosthodontic treatment, while the difference lies in the type of tissues to be replaced, and accordingly, the scope of materials and techniques employed. Some colleagues regard it as important to define maxillofacial prosthetics as a part of (prosthetic) dentistry. For example, in the latest GPT,¹⁵ maxillofacial prosthetics is defined as "the branch of prosthodontics." However, maxillofacial prosthetics encompasses also the fabrication and fitting of devices imitating structures outside the oral cavity, often situated rather far from it, and with quite different biofunctional tasks, eg, ears, eyes, and noses. Although treatment of such defects may require skill and knowledge similar to that required for the (re)habilitation of teeth and jaws, it does not automatically follow that maxillofacial prosthetics should be defined as a "branch of" (prosthetic) dentistry.

Since the primary aim of prosthetic dentistry is to provide care for people lacking teeth and/or adjacent structures, the discipline must be based on a thorough understanding of what the lack and/or loss of these structures means in terms of patient suffering, and/or in terms of development and progression of disease. A definition should reflect the dualities inherent in lack/loss and in suffering/disease, and at the same time be kept in terms as general as possible. Furthermore, a definition should also refer to the fact that prosthetics can only modify the consequences of tissue loss, since the insertion of a prosthesis will not alter the fact that biologic structures are still missing. Moreover, as for all other health care interventions, good versus harm must be evaluated,³¹ ie, negative as well as positive consequences of inserting prostheses must always be anticipated. Finally, in this age of biologic engineering, a definition of prosthetic dentistry should include reference to the kind of material employed. This reference helps to distinguish dental prosthetics from related disciplines like oral surgery and orthodontics, which may strive towards the same goals using different techniques.

Conclusion

A definition should reflect the activities within prosthodontic departments focused on both the assessment of the consequences of lack of oral tissues, as well as the outcome of modifying these conditions. Since the primary aim of prosthodontic

treatment is to improve the appearance, function, comfort, and oral health of the patient, emphasis should be made on these factors in the definition.

The authors venture that a definition should be adjusted accordingly to include:

The discipline of dentistry concerned with the consequences of congenital absence or acquired loss of oral tissues (on appearance, stomatognathic function, comfort, and local and general health of the patient), and with the methods for, and assessment whether more good than harm is done by inserting artificial devices made from alloplastic materials (to change these conditions).

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Literature Abstract

Retentive capacity of fiber-reinforced crown- and bridgework Targis-Vectris in relation to dental cementing.

This study evaluated the effect of different cementing methods on the retention of fiber-reinforced castings. The cementing systems used were phosphate cement (Harvard), ionomer cement (Fuji), carboxilate cement (Durelon), and adhesive (IPS Empress). Under standardized conditions, 32 natural teeth were prepared with diamond burs. The preparations illustrated natural conditions. The crowns were randomly assigned for one of the cementing systems. Fabrication of the crowns and cementations were performed according to the manufacturers' recommendations. The teeth with cemented crowns were subjected to standardized thermo- and load cyclings. The retention was then measured. There was no statistically significant difference in retention force between the phosphate and the adhesive cementing method. The mean values were 270 N for phosphate cement and 261 N for IPS Empress. Somewhat lower mean values were found for carboxilate (185 N) and ionomer (159 N) cements.

Körber KH, Körber S. *Zahnärztliche Welt Rundschau* 1998;107:32-41. (In German with English summary.) **References:** 14. **Reprints:** Prof Dr K. H. Körber, Dipl.-Phys. S. Körber, Klinik für Zahnärztliche Protetik, Propädeutik und Werkstoffkunde des Klinikums der Universität Kiel, Arnold-Heller-Str. 16, 24105 Kiel, Germany.—*J. Kihl*

Literature Abstract

Patient satisfaction with dentures made by dentists and denturologists.

This study compared patient satisfaction with complete dentures made by dentists or by denturologists. The participants in the study had answered advertisements for recruiting patients to clinical trials. They were interviewed by telephone using a questionnaire made by a dentist, a dental student, and a denturologist. There were 410 subjects aged 30 to 74 years; 91 treated by dentists and 319 by denturologists. No significant differences in sociodemographic characteristics were found between the two groups except a small difference in mean age. Both groups had paid approximately the same amount for their complete prostheses. Most individuals were satisfied with their maxillary prostheses but dissatisfied with their mandibular prostheses. Significantly more subjects in the denturologist treatment group compared to the dentist treatment group gave their mandibular prostheses a poor rating for general satisfaction ($P = .003$), comfort ($P = .04$), and stability ($P = .016$).

Morin C, Lund JP, Siouifi C, Feine JS. *J Can Dent Assoc* 1998;64:205-212. **References:** 14. **Reprints:** Dr Joycelyne S. Feine, McGill University, Faculty of Dentistry, 3640 University Street, Montreal, QC H3A 2B2, Canada.—*SP*