

# Oral Prosthetics from a Nordic Perspective

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**Purpose:** The purpose of this study was to describe oral prosthetics in a context intended for other, primarily Nordic, health professionals and health authorities. **Materials and Methods:** An article describing oral prosthetics for the general public was formulated on the basis of recent data and publications in prosthodontics from Scandinavian authors. A draft was presented to the educational committee of the Scandinavian Society for Prosthetic Dentistry for verification and consensus. Following modifications and amendments by representatives from the 11 dental schools in the Nordic countries, the educational committee has approved the present article. **Results:** The report consists of four sections describing oral prosthetics, prosthetic therapy, undergraduate teaching in oral prosthetics, and advanced oral prosthetics, from a Nordic perspective. The report appraises the various factors in context with demographic, cultural, and professional circumstances and suggests strategies for improvement of present conditions. **Conclusion:** The relationship between the undergraduate curriculum in oral prosthetics and the public need for advanced oral prosthetics must continuously be monitored so that patients can obtain optimal care from the profession. *Int J Prosthodont* 2002;15:145–153.

The panorama of health professionals is becoming increasingly complex in both dentistry and medicine. This leads to difficulties for the general public's ability to recognize characteristics and particulars of specific dental specialities. The objective of this report is to describe oral prosthetics in a context intended for other, primarily Nordic, health professionals and health authorities.

## Oral Prosthetics

Oral prosthetics is a specific discipline within dental education, treatment, and research. A long list of definitions of oral prosthetics can be identified.<sup>1</sup> Three modern and comprehensive definitions<sup>1–3</sup> of the discipline are presented in Table 1. A traditional, but rather trivial, definition of oral prosthetics is "the art and science of fabricating crowns, bridges, and dentures." In contrast, modern definitions focus on the

objectives of prosthetic therapy, that is, to improve anatomic, physiologic, and functional states using an artificial substitute (prosthesis).

Oral prosthetics is synonymous with the terms "prosthetic dentistry," "prosthodontics," "dental prosthetics," or "prosthodontia." In some European countries, the term "oral rehabilitation" is applied as identical to or mainly consisting of oral prosthetics. In Sweden, the discipline is often referred to as "oral prosthetic rehabilitation" in accordance with the description put forward by the Swedish health authority.<sup>4</sup>

Characteristic of prosthetic therapy is an integration of a thorough appraisal of the patient's subjective and objective treatment needs, with a practical performance based on a combination of theoretical knowledge, critical treatment decision analyses, clinical proficiency, and experience. Added to this is the necessity to understand and manage the multistep production process in cooperation with a dental technician.

Research activities in oral prosthetics are mostly aimed at exploring the issues described above. Other concerns are effects and consequences of oral tissue loss, on both individual and population levels, as well as benefits and harm of prosthetic therapy on the individual level. Prosthetic treatment is to a large extent

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**Table 1** Recent Definitions of Oral Prosthetics

Researcher	Definition
Jokstad et al <sup>1</sup>	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 of whether more good than harm is done by inserting artificial devices made from alloplastic materials to change these conditions
Öwall et al <sup>2</sup>	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; in cases where a sufficient natural dentition cannot be preserved, artificial substitutes should be used to restore essential functions
Academy of Prosthodontists <sup>3</sup>	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 craniofacial tissues with artificial substitutes

based on a practical application of biomaterials and biomechanical principles. Accordingly, studies directed toward development and evaluation of new biomaterials, including their basic physical and chemical properties, are an important part of prosthodontic research.

### ***Similarities and Differences with Other Disciplines in Dentistry***

Various disciplines can be identified in dentistry and dental research. Some clinical disciplines reflect activities and resource allocations with respect to a specific disease. Within dentistry, the primary diseases are caries, apical and periodontal periodontitis, oral medical conditions, and temporomandibular disorders. Research and management of patients with these diseases and disorders are organized within the disciplines cariology, endodontics, periodontics, oral medicine, and clinical oral physiology. Alternatively, clinical disciplines are defined according to patient-group characteristics (eg, pedodontics, gerodontology) or according to type of diagnosis or therapy (eg, radiology, orofacial diagnostics, orthopedics, and prosthetics).

Oral prosthetics has, in relation to other clinical disciplines in dentistry, many characteristics similar to orofacial orthopedics. A common trait for oral prosthetics and orofacial orthopedics is that therapy is not primarily aimed at pathology in the oral cavity, but rather at the consequences of congenital defects, pathology, or trauma. Thus, the indications and criteria for defining treatment needs, as well as evaluation and reasoning behind choice of treatment strategies applied to solve complicated clinical problems, are often similar. Furthermore, the appraisal of treatment results and consequences of not commencing treatment are fairly similar. Instead of using a conventional indicator for treatment success, such as absence of pathology, other indicators are used, eg, biologic consequences, improved esthetics, patient satisfaction, quality of life, and improvement of oral function (chewing capability,

speech, bite force). The apparent difference between orofacial orthopedics and oral prosthetics is the methods applied to reach the treatment objectives. Remaining teeth can be rearranged to achieve a desired harmony using orthopedic techniques, or the same goal can be obtained by insertion of foreign bodies imitating teeth and/or adjacent tissues, ie, prosthodontic methods. Obviously, complicated cases may require a combination of orthopedic and prosthodontic methods.

A characteristic of oral prosthetic therapy is a close and extensive collaboration between the dentist and the dental technician. The result of the treatment is markedly influenced by the quality of the dental technician's work. A prerequisite for adapting a technical appliance to the individual patient is good routines for communication between the dentist and the dental technician, since direct contact between the latter and the patient is often not feasible.

In many countries, maxillofacial prosthetics is defined under oral prosthetics and incorporated in the university clinics of oral prosthetics. This varies in the Nordic countries. In Denmark, a close cooperation has been established between the odontologic institute in Copenhagen and several local hospitals. A similar situation exists in Finland (for the dental faculty in Oulo), as well as for some dental educational institutions in Sweden. In Norway, maxillofacial prosthetics is managed by general prosthodontists assigned to a few large hospitals, which work independently or in cooperation with external dentists. General dental practitioners carry out maxillofacial prosthetic treatment in Iceland.

## **Prosthetic Therapy**

### ***Indications for Prosthetic Therapy***

An indication for prosthetic therapy exists if the patient is dissatisfied with their oral conditions for esthetic, functional, or social reasons. It is important to stress that lack of teeth, either congenital or acquired, is not per se a criterion for the need for therapy. In fact, very few objective criteria for prosthetic treatment need have

been identified. One exception is extreme tooth wear, which calls for some sort of intervention to avoid damage to the pulp and other ensuing consequences.

There is little evidence that loss of one or more teeth has any consequences for the general health.<sup>5</sup> Numerous epidemiologic surveys focused on oral health status and diet indicate a relationship between tooth loss status and nutritional intake. Several clinical studies show that edentulous patients in whom poorly fitting dentures are replaced with implants or new well-adapted dentures clearly improve their masticatory effectiveness, as indicated by indirect measurements. Common indirect measurements are bite force, effectiveness of food breakdown, determination of chewing cycle variables, etc. In contrast, clinical studies are in conflict regarding effects on changes or improvement of food selection and nutritional status among patients treated with a fixed or removable prosthesis. Indirect measurements have also been used to appraise possible improvements after rehabilitation of partial tooth loss, but the results are contradictory.

For many patients, the stomatognathic system, with its many varied functions, strongly influences their psychologic well-being. Some individuals, particularly within professions such as modeling and the performing arts, place much emphasis on having a socially "ideal" look. They can be esthetically very demanding and thus a challenge for any general practitioner. Most individuals will adapt relatively easily to various forms of tooth defects, while among others the loss of even a single tooth can create emotional reactions and a desire for orthodontic or prosthodontic treatment. Several treatment needs indices, especially in the orthodontic literature, reflect this aspiration for intact tooth alignments. Edentulousness represents an even bigger psychologic trauma and a handicap that many individuals never come to terms with or accept only with great difficulty. In exceptional cases, this aversion to edentulousness is so strong that conventional dentures have little or no improving effect.

A contraindication for prosthetic therapy is present if apparent risk elements associated with treatment or adverse effects following such treatment overshadow the possible positive benefits of treatment. Another contraindication is if the patient has adapted to the preexisting situation without any problems and there is no implicated pathology or risk of such.

### ***Patient Groups with Need for Prosthetic Therapy***

Congenital defects may be an indication for oral prosthetic therapy for social reasons, to avoid an inadequate development of a normal functional face, to restore lacking teeth, or to prevent a potentially unwanted occlusion. Most therapies are compli-

cated and require special qualifications in oral prosthetics.

Lip-jaw-palate clefts previously often required therapies that were finalized by some sort of oral prosthetics. Today, alternative treatment concepts are preferred, although most patient management teams still include a specialist in oral prosthetics. Surgery and orofacial orthopedics implemented at an early stage seem to give acceptable results in most cases, minimizing the need for subsequent prosthetic therapy.<sup>6</sup>

Agnesis of teeth fairly often leads to prosthetic therapy. In most situations, an appraisal is made of what is best for the patient, be it orofacial orthopedics, prosthetics, or both. Conventional tooth-supported or implant-supported prostheses are the most frequently used alternatives. Treatment centers that are specially organized to manage patients with congenital defects stress the importance of including prosthetic competency when alternative solutions for therapy are evaluated for these patients.<sup>7,8</sup>

Other congenital conditions include a heterogeneous group of rare conditions, such as anodontia, oligodontia, hypodontia, microdontia, connective tissue diseases, amelogenesis/dentinogenesis imperfecta, inadequate osteosynthesis, etc, which usually create oral problems. Dental treatment centers exclusively for patients with rare diseases have been established in Norway,<sup>9</sup> and later in Sweden<sup>10</sup> and Denmark.<sup>8</sup> In all three centers, the treatment teams include specialists in oral prosthetics.

Acquired loss of oral tissues is primarily the consequence of caries or periodontitis and, less often, tooth wear, dental erosion, or trauma. When a tooth is so damaged that a conventional restoration is not possible, single crowns or a prosthetic solution may be the alternative to extraction (or no treatment at all).

Color changes in one or more teeth can be restored using various methods including different bleaching techniques, tooth-colored restoratives, veneers, and crowns.

Toxicologic or allergic problems associated with existing restorations or prostheses, or wariness of such problems, are frequent indications for prosthetic therapy in Scandinavia.

Iatrogenic causes are related to, eg, inadequately designed restorations or existing prostheses that are unacceptable for technical/mechanical or hygienic reasons. Damage to oral soft or hard tissue following oral surgery may also require subsequent prosthetic treatment.

### ***Treatment Need and Oral Prosthetics***

The individual treatment need is basically associated with the status of the stomatognathic apparatus.

**Table 2** Estimates of Partial or Complete Edentulousness in the Nordic Populations (%)

Age (y)	Denmark (Bøge Christensen et al <sup>14</sup> )	Finland (Suominen-Taipale et al <sup>15</sup> )	Iceland (Ragnarsson <sup>16</sup> ; data from 1990)	Norway (Axéll <sup>17</sup> )	Sweden (Österberg et al <sup>18</sup> )
<b>Completely edentulous</b>					
> 16	12	6 (< 65 y)	29 (> 25 y)		3
55–65	24	23	40		8
65–75	40		68	60	18
> 75	55				29
<b>Partially or completely edentulous</b>					
18–75					13
60–65					25
65–70	71			50	42
70–75					55
75–80	88				65
> 85					82

However, subjective need is a complex issue that comprises the patient age, constitution, health condition, and social environment, in addition to the patient's desire for and attitude toward treatment.<sup>11</sup> The last factor is important, and it explains the large variations in use of dental services, as well as choice of type of prosthesis in both partial and complete edentulousness in different population groups.<sup>12</sup>

Treatment need on the population level is to a large extent reflected by the fact that there is an increasingly larger proportion of elders today who retain their teeth. The reason is a considerable improvement of oral health, probably because of use of fluorides in addition to improved general knowledge of the benefits of adequate oral care. The large majority of elders today wish to restore and conserve their teeth, whereas previously, extractions were chosen when problems developed. Studies in Sweden concluded that the biggest difference between dental conditions among elders today compared with previously is that, instead of being edentulous, the elders have teeth with many fillings, crowns, and fixed partial dentures.<sup>13</sup> A series of cross-sectional, cohort, and time series studies indicate the same trend in other industrialized countries. However, the most recent epidemiologic surveys<sup>14–18</sup> in the Nordic countries show that there are still large proportions of the population with partial or complete edentulousness (Table 2).

These estimates are probably slightly low, since cross-sectional studies often are associated with selection bias, ie, older and edentulous individuals are less apt to volunteer to participate in such studies.<sup>19</sup> From an epidemiologic viewpoint, one can assume that there is an increased latent need for prosthetic therapy compared to previously. However, it is difficult to precisely compute the amount of this objective treatment need.

### **Prosthetic Therapy, Main Principles**

The main objective of oral prosthetic therapy is to advance, create, and retain for the patient with congenital or acquired defects the various functions of the stomatognathic systems as best as possible within an oral physiologic and social context. Oral prosthetic treatment comprises separate phases with specific aims:

1. Identify individuals' problems related to the stomatognathic system, followed by an attempt to solve these (psychologic problems, lack of information, harmful habits regarding oral and prosthesis hygiene, as well as diet, chewing habits, tooth clenching, etc) without operative interventions.
2. Remove all pathologic conditions in the oral hard and soft tissues. Normally, it is not clinically acceptable to initiate a rehabilitative treatment phase before all pathologic processes are identified and treated.
3. With an individually made and adjusted prosthesis, attempt to preserve or restore (eventually compensating for negative changes) in the stomatognathic system the (1) social function, ie, phonetics and appearance; and (2) chewing function, ie, biting and chewing ability and efficiency, stability in jaw relationship, and neuromuscular control of a harmonic joint-muscle function.
4. Create and maintain the best possible situation for adequate oral and prosthesis hygiene.
5. Establish adequate hygiene and control routines to avoid subsequent complications.

### **Oral Prosthetic Treatment Results**

Oral prosthetic treatment will always change the patient's appearance and function, aspects that are

often difficult, and sometimes impossible, to quantify objectively. Therefore, the patient's opinion of the treatment outcome has traditionally been regarded as an important measure for evaluating treatment success in oral prosthetics. Other typical criteria used to describe treatment outcomes and consequences are, eg, biologic effects, esthetic measures, prosthesis stability and/or longevity, improvement in chewing effectiveness and bite strength, and various measurements of chewing and swallowing of foods.

The primary functions of the oral cavity are influenced by an intraoral prosthesis. This effect can be deliberate or unintended and can work positively (improved function) or negatively (impaired function) (Fig 1).

### Undergraduate Teaching in Oral Prosthetics

The objective of undergraduate teaching is to transfer to students basic knowledge to enable them to carry out uncomplicated prosthetic therapy. This requires (1) understanding of physiologic and non-physiologic functions of the stomatognathic system; (2) awareness of fundamental biomechanics; (3) substantial knowledge about possibilities and limitations of dental biomaterials; (4) practical training, experience, and sufficient clinical skills; and (5) familiarity with all details relative to the multistep phases (both the dentist's and dental technician's) in a long and sometimes complicated treatment process.

### Undergraduate Clinical Training in Oral Prosthetics

The curriculum in oral prosthetics consists of core subjects included in general dentistry as well as more specific oral prosthetic topics. Since prosthetic therapy requires a holistic approach to treatment planning, competency in other clinical dental disciplines such as periodontics, cariology, endodontics, and oral physiology is required. Adequate prosthetic therapy further requires that the operator have theoretical knowledge to appraise the biotechnologic and biomechanical limitations and possibilities enabling the design of prostheses. Finally, to obtain the best possible treatment outcome and prognosis, additional knowledge is needed relative to psychology, phonetics, esthetics, and even nutrition.

Since oral prosthetics thus is a clinical discipline in which all these factors must be integrated and transferred to practical patient treatment, it is apparent that clinical experience is important. Prosthetic therapy cannot be learned from a textbook, and clinical qualifications in the field can only be acquired through practical training under competent

#### Passage/intake of substances

Gaping\*  
 Catch and hold parts\*  
 Sucking\*  
 Breathing, inhalation of vapors, smoke, etc  
 ↓  
 Sensory apparatus for taste, temperature, structure\*  
 Mechanical degradation by biting and chewing\*  
 Saliva lubrication\*  
 Detection of foreign particles/damaging substances\*  
 ↓  
 Spitting  
 Mucosal absorption (eg, snuff)  
 Swallowing\*  
 Vomiting

#### Neurophysiologic functions

Communicating: phonetics, speech, singing\*  
 Kissing\*  
 Whistling\*  
 Sensory pleasures\*  
 Emotional expression\*  
 Bruxism, teeth clenching\*  
 Yawning  
 Sneezing, coughing

#### Instrumental functions

Blowing  
 Instrument playing\*

**Fig 1** Functions related to the oral cavity. \* = functions that an oral prosthesis definitely or probably influences.

instructor supervision. For more than 25 years, the teaching institutions in the Nordic countries have cooperated closely through the Scandinavian Society for Prosthetic Dentistry to coordinate their curricula and adopt common requirements and objectives in undergraduate training in oral prosthetics.

### Basic Competency in Oral Prosthetics

The aim of the undergraduate training program in oral prosthetics is to bring the students to a level of skill, knowledge, and understanding that enables them to take care of simple treatment cases involving fixed and removable prostheses. Most of the teaching institutions in the Nordic countries largely limit their teaching to crowns, fixed partial prostheses, removable partial prostheses with conventional clasps, and dentures.

The teaching of implant-based prosthetics varies among the Nordic dental schools. In Århus, Denmark, and partly in Umeå, Sweden, the students produce implant-based prostheses, while the other institutions

concentrate on the theoretical basics and limit clinical training to organization of clinical demonstrations. More complex types of prostheses are more summarily dealt with in the undergraduate curriculum in oral prosthetics. This is partly due to lack of suitable patients, and partly due to the fact that time in the curriculum will not allow the students to reach an acceptable level of clinical experience and manual dexterity to proceed with more technically complicated treatments.

Several dental schools have experienced practical teaching problems due to lack of patients requiring some forms of prostheses, eg, fabrication of removable dentures. Advertising in newspapers with a focus on low-price treatment has partly solved this problem. It is a dilemma that the pool of patients needing removable partial dentures and complete dentures is low in urban areas, where the dental schools are located, while in rural areas there is an extensive demand for dentists with skills in fabricating and adjusting removable dentures.

## Advanced Oral Prosthetics

### ***Complicated Problems and Need for Referring Patients***

In many complicated patient situations, advanced solutions for oral prosthetic treatment are needed. These are usually selected after conferring with or in cooperation with other dental and medical specialists. In these situations, special requirements regarding the dentist's clinical expertise are required. The legislation is fairly similar in the Nordic countries, in that a dentist is required to refer a patient to a specialist in a situation in which he or she recognizes a limitation of competency relative to a complex task. Examples of patients with complicated treatment situations are listed below, ranked by estimated prevalence. It must be emphasized that there are no data to support these estimates, and that there are probably regional and national variations.

1. Adults with an extensively reduced occlusion with combinations of tooth spaces and endodontic, periodontic, and cariologic problems, eventually also with supraeruption of antagonists, tooth mobility, inclined teeth, etc, where alternative technical solutions of fixed and removable partial dentures and implant-based prostheses must be considered
2. Adults with advanced tooth wear and uncertainty as to whether there is a need for establishing a new vertical occlusal dimension
3. Adults with edentulous jaws and advanced bone resorption, where the bone quality hinders or

limits the possibility to select an implant-based prosthetic solution

4. Adults with a greatly reduced support after periodontal diseases, where the objective is to retain the remaining teeth
5. Patients in all age groups with a combined orofacial orthopedic and oral prosthetic treatment need
6. Children and adolescents with agenesis, where alternative treatment modes need to be appraised
7. Patients in all age groups with traumas, where complementary treatment solutions need to be considered
8. Patients in all age groups with postsurgical lesions after orofacial cancer
9. Patients in all age groups in need of implants as support for prostheses, where the general medical situation or other relevant factors may jeopardize the success of implant surgery
10. Children and adolescents with congenital deficiencies or need for orthognathic surgical corrections of jaw-relation anomalies

Several anecdotal reports suggest that referrals of patients with a need for oral prosthetic therapy vary considerably from country to country. In Sweden, where oral prosthetics is recognized as a separate dental specialty, dentists may refer their patients to oral prosthetic specialists working in county dental competency centers. Dentists working in the public dental health system in particular use this service extensively.<sup>20</sup> In a fairly recent survey among general practitioners in Norway, a large majority answered that very few patients were referred to oral prosthetic specialists, and it was felt that the need for such service was minimal.<sup>21</sup> This may indicate that many general practitioners regard their clinical competency as adequate for treating the patients listed in the categories above. Unfortunately, a more probable situation is that patients in these groups run the risk of receiving treatment of suboptimal or even unacceptable quality unless a national system for referring such patients to specialists in oral prosthetics has been established and used.

An indirect measure of the quality of various forms of dental treatment can be appraised from characteristics of malpractice reports. Several reports during the last decades from different countries show that the majority of patient complaints are associated with fixed and removable prosthodontic treatment. Several theories have been proposed to explain the phenomenon, and the relatively high cost factor is probably important. However, more detailed analyses of these malpractice cases reveal the disquieting fact that in many situations the quality of prosthetic treatments was simply not acceptable, eg, in reports from

Norway,<sup>22</sup> Sweden,<sup>23</sup> and Denmark.<sup>24</sup> It is not unreasonable to assume that many of these malpractice cases might have been avoided if dentists to a much larger extent had made use of the service offered by oral prosthetic specialists for examinations and diagnosis or management of their patients.

Adequate treatment of patients with complicated clinical problems can be organized in various ways. The only health authority in the Nordic countries that has established national guidelines for oral prosthetics is the Swedish health authority, Socialstyrelsen. In these guidelines, the obligations of the oral prosthetic specialist are to "function as a consultant; coordinate and appraise oral prosthetic rehabilitation performed by different dental professionals, and to contribute during the planning and treatment outcome appraisal phases."<sup>4</sup>

### **Improving Competency Among General Practitioners**

The great majority of prosthetic treatments are completed by general practitioners with minor problems. After some time in practice, most practitioners gain enough clinical experience and skills to carry out acceptable prosthetic treatment in most situations. In addition to the competency and skills improved by trials and failures in their own clinical practices, courses are available from various sources. Courses in oral prosthetics have for many years been among the most popular topics in organized continuing dental education curricula, which indicates a continuous demand for renewal of knowledge within the discipline. In addition, both the dental materials and implant industries frequently offer training in which invited clinicians present their proficiency and experiences, often combined with "hands-on" or workshop sessions. An advantage of these types of activities is that they may generate new enthusiasm and restoration of work satisfaction for the general practitioner. A disadvantage is that the courses invariably aim at improving manual skills and/or knowledge about treatment solutions limited to one specific commercial product or producer.

### **Specialty Training in Oral Prosthetics in the Nordic Countries**

Clinical specialty training in oral prosthetics aims to improve special competency that enables the dentist to:

- Diagnose potential causal factors for the patient's problems and appraise the benefit versus harm of alternative prosthetic interventions, including no intervention

- Plan and manage prosthetic treatment of patients with extensive and complex needs for rehabilitation and, when required, establish cooperation with other specialists in carrying out optimal treatment
- Function as a consultant for colleagues
- Present lectures and tutor on a postgraduate level for dentists and auxiliary dental health personnel
- Plan and carry out treatment with all varieties of oral prostheses
- Critically appraise new information, both scientific and nonscientific, concerning materials, instruments, and principles related to oral prosthetics
- Plan and carry out research, especially clinical research, on topics related to oral prosthetics, thus contributing to the knowledge basis for, and improving the scientific validity of, oral prosthetic therapy

Specialty training in oral prosthetics varies in the Nordic countries. Denmark does not recognize the discipline as a specialty, and there are no systematic postgraduate training programs offered by the dental schools. In Finland, oral prosthetics is incorporated into a wider specialty titled clinical dentistry, and the training period is 3 years. Iceland has no postgraduate program in oral prosthetics. A dentist who applies for a specialty certification in oral prosthetics in Iceland has to document 3 years of postgraduate training. In Norway, the postgraduate training program is 3 years, and is closely adapted to other postgraduate programs, eg, periodontics, pedodontics, and oral surgery regarding theoretical courses, patient treatment, clinical tutoring, etc. Completion of these 3-year postgraduate programs entitles the dentist to be registered as a specialist. An exception is for the oral prosthetic program, where the Norwegian Dental Association has determined that graduates are only allowed to advertise under the heading "specialty trained in oral prosthetics." In Sweden, the training period is 3 years, organized as one core educational part plus a special clinical component. Upon completion of the program, the dentist is entitled to be identified as a specialist in oral prosthetics.

The dental schools in Finland, Norway, and Sweden, as well as some of the competency centers in Sweden, offer a program for systematic postgraduate training in oral prosthetics. The contents of the postgraduate programs vary among the three countries, although the training period is at least 3 years. To a variable degree, the education consists of theoretical courses in basic sciences, specific clinical disciplines and supportive sciences, literature appraisals, seminars on central oral prosthetic topics, treatment of patients with complicated problems, clinical teaching for undergraduates,

written papers in terms of a scientific publication, review or teaching programs, and final exams.

In many countries, passionate discussions are going on about specialization in dentistry. All arguments aside, the line should be whether this is for the advantage of our patients. Two views are shared by many colleagues. The first is that the building of clinical competency and manual skills in advanced oral prosthetics should be carried out in controlled forms and under the supervision of experienced clinical teachers and researchers. The second is that advanced training is required to learn how to manage the most appropriate intervention for the individual patient on the basis of a correct diagnosis, recognition of patient values, defined treatment objectives, prognosis, and other relevant factors, and to appraise the short- and long-term benefits and intervention outcomes relative to alternative treatment solutions. Specialization is not primarily about learning how to do things correctly—it is about learning how to do the right things at the right time for the right patient.

### **Specialties and Oral Health in Populations**

It is assumed that the dental conditions in populations to some extent reflect how national dental health care systems are organized.<sup>25</sup> The need for oral prosthetics as a clinical specialty may be argued for by the need for complicated patient treatment or vice versa, ie, a widespread need for prosthetic treatment in the population speaks against specialization. In the past, this issue has not been appraised, but recent studies comparing dental conditions among middle-aged and older people in Denmark and Sweden may indicate that the latter explanation is plausible.<sup>26,27</sup> Denmark and Sweden are two countries with a similar standard of living but with different national dental care policies for adults. Danes pay more money for dental care out of their own pockets than Swedes, but in spite of this fact, poorer dental conditions (measured as number of missing teeth) are seen in the Danish population. A significantly higher proportion of Danes wear removable dentures compared to the Swedes, and vice versa for fixed partial dentures. The study may of course have been influenced by unidentified confounding factors like population differences regarding attitude toward use of removable versus fixed appliances and the presence of clinical denturism in Denmark. Also, the fees for fixed prosthodontics are much higher in Denmark than in Sweden, making it possible only for wealthier people to demand expensive treatment. Further clinical studies are needed to clarify the relationships.

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*Literature Abstract*

### **Position of the teeth on the edentulous atrophic maxilla.**

The purpose of this study was to determine landmarks that can assist in the positioning of anterior teeth in the edentulous atrophic maxilla. Selected for this study were 335 postmenopausal women who were part of an osteoporosis study and aged 48 to 56 years. Of these patients, 230 had been edentulous for an average of 29.9 years; the remaining 125 patients were partially dentate, allowing determination of tooth position. Plaster cast models were obtained, and several measurements were taken to compare dentate models with edentulous ones. ANOVA was used to analyze the means. The incisive papilla serves as a good determinant for the sagittal position of the anterior teeth in the presence of a severely resorbed labial wall. Its labial edge appears to be unaltered even in the edentulous patient, and its distance from the anterior teeth is usually equivalent to twice its length. The position of the canines can also be determined with the use of the incisive papilla by indicating the position of the alveolar wall. An average of three quarters of the body of the canines is usually positioned outside the alveolar wall in the transverse position. The first premolar position can be determined by placing it at one third the length of the palate measured from the labial edge of the incisive papilla. The first molar position can be placed at two thirds the length of the palate measured from the same landmark. The buccolingual position of these posterior teeth can also be determined with the use of a scar line, which is usually a remnant of the extracted teeth. The premolars and molars are usually dissected by this scar line buccolingually. The buccal surfaces of these posterior teeth are located 5 to 6 mm buccal to this scar line on average.

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