European Prosthodontic Association

Curriculum Guidelines for the education and training of specialists in Prosthodontics in Europe

Prepared and adapted in accordance to the curriculum proposal published by the International College of Prosthodontics in 2013

Table of Contents

Introduction

This document sets out guidelines for a curriculum, which may be considered the minimum requirements for a specialty course in Prosthodontics in terms of experiential and theoretical learning needs. Each University will, of necessity, also separately provide (considering the special oral healthcare needs of the country and according to its rules and regulations) its own comprehensive study guide setting out the organizational structure of the entire program, the academic program, the timing of presentation of the courses, requirements of the students, infrastructure available, assessment schedules, etc.
Other accreditation documents are available. For example, documents for the USA may be accessed at http://www.ada.org/pro.f/ed/accred/index.asp and for Canada at http://www.cda- adc.ca/english/dentistry_in_canada/cdac/default.asp

Recommended Program Structure

In addition to necessary didactic and clinical facilities, unlimited access to the dental literature via a well-equipped library or internet access facilities may be considered mandatory. A three-year full-time program or a complete two-year program followed by a one-year complementary program with a total of 120-180 ECTS credits would be considered to constitute a minimal program duration for all the aspects included. Extension to a longer period would be at the individual institution's discretion dictated by full or part-time considerations, extended periods for complex case completion, research project completion, and inclusion or exclusion of certain aspects depending on regional requirements. An additional one or more years for an additional maxillofacial program (and in some countries an Endodontic program) may be advocated in some regions.

Curriculum Recommendations

Didactic and clinical requirements are often divided in a time ratio of 60%/40%. This may vary between institutions. Didactic requirements may be provided in various formats from formal courses or seminars with prescribed curriculum and outcomes at prescribed levels of knowledge as for example i) in-depth ii) understanding iii) familiarity.
The courses outlined below are guides to content rather than requirements in terms of their course titles. Indeed, where a country may certify specialists with a scope of practice limited to, for example, fixed prosthodontics or maxillo-facial prosthodontics, then these courses would not apply. Similarly, when a country has a specialty of endodontics or of "implantology" (the use of the term "implant dentistry" is preferable), these aspects may be modified.
This document includes all such aspects in order to provide a minimum definition of the wider scope of prosthodontic practice. It is recognized that regional and health policies and priorities will dictate a specific focus for prosthodontic rehabilitation, and those priorities will, of necessity, define the expected scope of practice.

1. Exit level Outcomes / Competencies

1.1 Overall objectives

The objective is to produce knowledgeable and skilled specialists who have developed and formulated their own philosophy through exposure to a wide spectrum of prosthodontic principles, concepts and practices.

It is suggested that learning should be significantly self-directed, and be promoted through provision of resources, discussion and training. Seminar topics should be allocated to individual students to prepare written and oral presentations.

Advanced clinical training will take place with due respect for (1) individual students and with an awareness of the various approaches to clinical decision-making. The implication is, however, that students will embark upon their post-graduate studies with an acceptable clinical background and a responsible professional attitude. They are expected to strive for perfection in all that they do; and (2) patient-specific requirements and be provided as patient-specific treatment following informed consent.

1.2 Competencies

- To understand the evolutionary and embryological development of the oral and cranio- facial structures, the stomatognathic system and the natural dentition from a bio-functional perspective.
- To know the biological (including anatomical and physiological), and functional principles to be followed in designing appropriate prostheses for the replacement of the oral and cranio-facial structures.
- To appreciate the changes in the form and function of the mouth and jaws brought about by loss of teeth and/or oral and cranio-facial structures and the social and behavioural consequences of this loss.
- To understand and manage the impact of frailty on the oral health and prosthodontic needs of elderly people.
- To understand and be capable of informed discrimination when evaluating the merits of conflicting philosophies with regard to the biological and physical rationale for the clinical and laboratory procedures employed in the construction of different types of prostheses.
- To be able to critically evaluate the influence of prostheses on the remaining soft tissues and the underlying supporting structures.
- To understand the scope and limitations of different types of prostheses together with the bio-compatibility and physical properties of all materials used in Prosthodontics.
- To be able to evaluate the need for prosthodontic intervention and the long-term consequences of any technologies used, and to demonstrate effective use of technology applicable to a given clinical situation.
- To be able to document and present, for peer review, evidence-based reviews of the prosthodontic literature.
- To acquire and assimilate scientific knowledge and associated clinical experience appropriate to the discipline to be applied in patient assessment.
- To demonstrate professional clinical reasoning and judgement, and the technical skills required to competently diagnose relevant systemic, oral and dental diseases including oral and cranio-facial defects and anomalies pertaining to the specialty.
- To acquire an ability to render an evidence-based best practice comprehensive service to patients who require complex prosthodontic treatment, by managing

a multidisciplinary health team involving other disciplines, and to produce carefully documented case reports supported by photographic evidence.

- To gain an understanding of basic research methodology, and to be able to conceive, develop, and carry out an independent research project, which ideally could be published.
- To have an understanding of the socio-economic consequences of the provision of a comprehensive prosthodontic service for all types of communities, and of the socio-political role of the specialty in relation to national oral health policy and other relevant national legislation.
- To be able to evaluate the alternative procedures available for the provision of a prosthodontic service based on appropriate technology for communities with different socio-economic resources.
- To know and apply learning techniques and strategies, including assessment and examination techniques.
- To know how to engage in lifelong learning through well-developed self-directed learning skills to maintain continued professional development and competence and show a continuous interest in new developments in the specialist field.
- To demonstrate professional and ethical behaviour.

2. Primary Courses

Note: these topics may be presented as part of integrated courses but are set out here separately in order to ensure that the individual topics are covered.

2.1 Anatomy

An Anatomy course would include the following topics: anatomy of the head and neck including the cranial nerves; the principles of human genetics; the histology of the primary tissues and of oral structures; and oro-facial embryology.

2.2 Physiology

A Physiology course would aim to provide an overview of the clinical physiology relevant to the practice of dentistry and include: basic neurophysiology; autonomic nervous system; respiration; cardio-vascular system; immunology and wound healing; vitamins and minerals; saliva; muscle physiology; mastication; deglutition; and oral sensation.

3. Major Courses

3.1 Techniques (pre-clinical) Courses

The preclinical courses are not obligatory but are considered helpful in order to homogenize the postgraduate students who may be from different educational backgrounds.

3.1.1 Fixed Prosthodontics

Restorations:
The construction of at least the following restorations from preparation to delivery preferably including all laboratory work:

- Indirect partial restoration
- All-ceramic crowns or fixed dental prosthesis (FDP)s
- Metal-ceramic crowns or FDPs
- Implant-supported crowns or FDPs
- CAD/CAM restorations including digital workflow.

Provisionals:

- The construction of provisional crowns and FDPs by direct and indirect methods as well as the necessary skills to modify the emergence profile over teeth, implants and pontic areas.

Cores:

- The construction of a direct and indirect posts and cores.

Occlusion:

- The programming of a variety of articulators.
- Occlusal analysis exercise on casts mounted on a semi-adjustable articulator, and methods for occlusal equilibration.
- Occlusal waxing exercises building up stable, static and dynamic occlusal relationships.
- Knowledge of current electronic jaw tracking motion and occlusal registration devices.

3.1.2 Removable Prosthodontics

Complete dentures:

- To carry out all the laboratory work for at least one case of complete dentures.
- To provide characterization of gingiva, flange and teeth.
- To be familiar with conventional and digital workflows

Removable dental prostheses (RDPs):

- The production of design drawings for RDPs
- The laboratory procedures for the processing of at least one polymer-based RDP incorporating pre-formed wire components
- The observation of all stages in the construction of a cast metal base.
- To be familiar with conventional and digital workflows

3.1.3 Implant Dentistry

- Prosthetically-driven diagnostics and planning of the implant cases
- The laboratory procedures for at least one case of an implant supported overdenture.

3.2 Clinical Courses

3.2.1 Complete Removable Dental Prostheses (RDP) produced either conventionally or using digital workflow

Note: Numbers are not mentioned as they are only a guide and will vary widely from country to country;

- Complete Removable Dental Prosthesis, with a difficulty factor (for example: extreme residual ridge resorption, neuromuscular disorders, following trauma or cancer, children, immediate dentures, etc.).
- Competence must be demonstrated in different ways of achieving jaw registration positions using extra-oral and intra-oral registration methods.
- Understanding of different occlusal schemes, in particular cusped articulation and lingualized occlusion, for different skeletal jaw relations and according to clinical indications.
- Different techniques (for example impression making, registration) should be demonstrated.
- In addition, a single maxillary denture opposing natural teeth is recommended, as well as the implementation of the denture duplication technique during denture construction.

3.2.2 Partial RDP produced either conventionally or using digital workflow

- Conventional metal-frame RDP using different techniques such as altered cast, dual path of insertion.
- At least one attachment retained RDP.
- Polymer-based RDP
- Overdenture of different designs (telescopic, perio-overdenture).

3.2.3 Fixed Prosthodontics produced either conventionally or using digital workflow

- The use of face-bow recordings and appropriate inter-occlusal recording materials and methods to mount models on a semi-adjustable articulator, to appropriately adjust the articulator, and to use custom incisal guide tables and diagnostic wax-up procedures.
- Using current electronic jaw tracking motion and occlusal registration devices
- The use of a suitable scheme to analyze a natural dentition and carry out a systematic adjustment of the natural occlusion to produce an optimum and harmonious occlusal scheme within the patient's stomatognathic system.
- Make appropriate recordings, construct, fit, and adjust a Michigan type occlusal splint.
- Understanding of the treatment steps in digital and conventional workflow fabricating fixed dental prostheses and single crown restorations (impressions, fabrication methods)
- Understanding minimally invasive treatment concepts for example resin-bonded FDPs

At least 5 completed cases demonstrating total patient care and interdisciplinary management incorporating the following aspects:

- The rehabilitation of posterior occlusal surfaces using indirect restorations
- The restoration of missing teeth by means of resin-bonded FDPs, metal or ceramic based, as well as with the use of polymer impregnated fibers.

- Rehabilitation of the complete dentition with combinations of individual crowns and FDPs.
- Rehabilitation of the dentition with minimally invasive treatment concepts
- Rehabilitation of the dentition for a periodontally compromised patient
- Restoration of function for severe loss of tooth structure
- Restoration of a dental trauma case
- Restoration of function for severe bone loss
- Cases including the use of implants

3.2.4 Implant Dentistry

- Interdisciplinary, prosthetically-driven planning for the placement of implants, including the use of special techniques such as imaging, rapid prototyping, templates, interim prostheses.
- Participation in the surgical procedures and where possible for the placement of implants. The design and placement of implant-retained prostheses for complete and partial tooth loss.
- The use of implant-retained RDPs, such as individual retainers, bar and clip retainers, ball and precision-attachment retainers.
- The restoration of missing teeth with single and multiple implants. The fixed restoration of the severely resorbed maxilla and mandible.
- Exposure to different technologies for the construction of implant supported prostheses using conventional or digital workflow protocols such as digital impressions CAD/CAM, milling, casting, 3D printing.
- The management of complications by treating patients in an implant maintenance clinic.

3.2.5 Dental Geriatrics

Dental geriatrics is concerned with the management of oral health and related issues in people who are old and frail. Proficiency in dental geriatrics includes:

- Knowledge of the physiology of aging and the influence of medications and disease on oral healthcare for a geriatric population;
- Understanding of the delivery of oral healthcare to frail elders;
- Management of oral healthcare in geriatric clinics, long-term care facilities, palliative care, and other supportive environments for in-patients and out-patients;
- Delivery of oral healthcare to a range of abled and frail elders;
- Collaborative practice on inter-professional teams with other healthcare providers in the medical and social services associated with the needs of frail elders.

Clinical competence includes:

- The modification, adaptation and use of appropriate techniques in the treatment of the elderly patient with a partial or transitional dentition, as well as in the provision of complete dentures for the elderly patient

3.2.6 Dental Biomaterials

Understanding the mechanical and physical properties of different materials used for prosthetic dentistry (such as impression, bite registration and restoration materials). Recognizing the indications of use, requirements for material thickness and mastering the adhesive procedures of each material.

3.2.7 Cranio-mandibular disorders and orofacial pain
The completion of several cases of interdisciplinary care, managed and documented.

3.3 Research Report/Mini thesis/Minor dissertation
Throughout all years of the course, the student will be exposed to aspects of research methodology including the critical appraisal of research papers, an understanding of systematic reviews and how to undertake them, the role of evidence-based dentistry, and the use of statistical analyses. A research methodology course is considered to be a part of this component.
A research report must be produced which shows evidence that the student has gained an understanding of basic research methodology, and was able to conceive, develop, and carry out independent research.
This requires the development of a suitable protocol, which must conform to the University's guidelines, and which must be submitted at the appropriate time for approval, prior to conducting the research. The report, in appropriate form, must be acceptable to external examiners according to the rules of the University. It does not necessarily receive a mark, but must have been declared acceptable before the final clinical assessment is taken and before the degree can be awarded.

4. Additional / Subsidiary Courses

Note: these topics may be presented as part of integrated courses but are set out here separately in order to ensure that the individual topics are covered. The titles of the courses may be changed. It is recommended that they be assessed.

4.1 Oral Biology/Physiology
This course includes topics such as the evolutionary and embryological development of the oral and cranio-facial structures, stomatognathic system and the natural dentition; form and function in the stomatognathic system; mastication; oro-facial feedback and defence mechanisms; tissue responses in the oro-facial region; bone growth; orthognathics; etc.

4.2 Oral Pathology and Oral Medicine
This includes topics such as oral mucosal diseases; salivary gland disorders; pathology of dental tissue; pathology of bone and synovium; age changes in the oral tissues; histological diagnostic criteria for hard and soft tissue diseases; radiological signs for differential diagnoses; treatment of the medically compromised patient; etc.

4.3 Periodontology
Topics include the clinical appearance of oral mucosal diseases; surgical and non-surgical treatment of routine and periodontally-involved cases; use of surgical techniques for crown lengthening, recession coverage and hemi-section; the relationship between periodontal health and prosthodontic treatment; peri-implant tissue management; etc.

4.4 Endodontics

This course includes current endodontic treatment protocol, prognosis of the root canal treated teeth, indications and methods for re-treatment, indications for surgical root tip resection, use of surgical techniques for root tip resection, the relationship between the endodontic health and prosthodontic treatment, evaluation of the need for root canal post; etc.

4.5 Oral Microbiology

This course includes: bacteriology; virology; bacterial pathogenic mechanisms; microbial techniques; sterilization and disinfection; immunology, etc.

5. Attendance Courses

Note: these topics may be presented as part of integrated courses but are set out here separately in order to ensure that the individual topics are covered. It is recommended that these be attendance courses, as it is not considered necessary to formally assess them.

5.1 Research Methodology

Introduction to research methods; Elementary statistics; computers in research; laboratory animal science; experimental design; research protocols; critical appraisal of research papers; research reports, dissertations and theses for different levels of degree; grant writing; presentation of papers at congresses; ethics and honesty in research.

5.2 Radiographic Diagnosis

The normal anatomy of the maxillofacial region including the anatomy of the temporomandibular joint as seen on computerized tomography and magnetic resonance imaging.

The concepts of the panoramic image, cephalometric and implant radiography, digital imaging and cone-beam volumetric tomography.

The application of diagnostic imaging in the interpretation of lesions of the maxillofacial region.

Recognition of the more common abnormalities affecting the maxillofacial region as well as the signs and symptoms of important malignant lesions to inform an acceptable differential diagnosis.

5.3 Speech Therapy

This course covers the basic aspects of speech, the articulators of speech as they apply to prostheses and in particular the effect on speech of defects in the cranio-facial region and the rehabilitation of speech along with the rehabilitation of the area with prostheses.

5.4 Maxillo-Facial and Oral Surgery

This course is provided to give the student in Prosthodontics an understanding of the surgical procedures involved in such aspects as orthognathic surgery, trauma, oncology, implantology, augmentation, etc.

5.5 Orthodontics

The interdisciplinary aspects of appropriate treatment planning and management with respect to the need for orthodontic repositioning as adjunctive therapy together with Prosthodontic rehabilitation is taken together with students in Orthodontics to gain an

understanding of the procedures that will assist both disciplines in effecting an appropriate outcome for the patient.

6. Adjunct / Integrated Topics

It is recommended that these topics be integrated into the major courses where and when appropriate: they are listed here for completeness, and individual study guides will provide more detailed information.

- Behavioral science
- Educational methodologies
- Dental Ethics
- Public health

7. Ancillary Courses

Although not compulsory, students are strongly encouraged to undertake additional courses, which will contribute to their overall professional development, and enable them to acquire additional skills and experiences. The recommended courses, which the students are expected to arrange for themselves and in their own time, are as follows:

7.1 Dental Photography

Dental Photographic skills must be acquired in order to help the student in case documentation and case presentation of their clinical work.

7.2 Dental Laboratory Workflow

The students should be familiar with the Dental laboratory's conventional and digital workflow. Where resources are available the students should gain experience in the laboratory digital scanning, digital design, using a variety of laboratory software (i.e. 3shape, InLab or Exocad software)

8. Final Assessment

It is not the purpose of this curriculum document to dictate the methods of assessment of all courses, other than to expect that sound pedagogy will underlie all assessment practices.