

Faculty of Dental Surgery (FDS) Royal College of Surgeons of England

Syllabus for Higher Specialist Training in Prosthodontics

Specialist Advisory Committee for Restorative Dentistry

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Foreword

This clinical syllabus sets out the competence required for the attainment of the award of the Certificate of Completion of Specialty Training (CCST) and admission onto the Specialist List for Prosthodontics and associates with the General Dental Council's (GDC) specialty training curriculum for Prosthodontics¹. It was developed in collaboration with the British Society of Prosthodontics (BSSPD).

The focus of the syllabus is competence-based. Competence refers to the trainee's capability to perform the specialist's responsibilities and is a move away from the previous task orientated delivery based on a competency framework focussing on the trainee's actual performance in a situation. This change in practice is aimed at meeting the standards expected of a specialist to deliver high quality patient care that is safe, and patient centred amid managing increasing demands and expectations of today's patients within the United Kingdom based provision of health care.

The syllabus maps to the domains of the Membership in Prosthodontics Examination of the Royal College of Surgeons in the UK².

Introduction

This clinical syllabus is underpinned by the generic professional content of the speciality curriculum as listed by the GDC¹, with all professionals expected to be cognisant and compliant with this framework throughout their training. It is assumed that trainees on entrance to specialty training have achieved the basic standard of knowledge and skills in dentistry and the emphasis of the training is becoming a Specialist in Prosthodontics which is a three-year full-time training programme or four-year part time. Although the focus of the clinical syllabus is Prosthodontics, trainees involved in this training should be exposed to the range of specialities that underpin the discipline thus preparing them to meet the complex and integrated treatment needs of today's population.

Training providers will be expected to fulfil the quality standards established by the GDC² and trainers should be familiar with the contents of this clinical syllabus to ensure that the trainee achieves the necessary requirements. The essential components are outlined with an indication of the expected standards and capabilities from all providers. The domains are deliberately kept broad to allow for variation in training opportunities in different institutions whilst recognising the differing experience of trainees at the start of training. Each domain is divided into the Knowledge and Clinical Skills required to demonstrate competence in that domain.

The syllabus sets out a guide for training, encompassing the contents of the specialty curriculum, to ensure that the trainee progresses through a journey of progressive development. Year 1 focuses on acquisition and understanding of core knowledge, skills and behaviours which form the foundations, essential for the development of the trainee's personal learning experience and growth. During year 2 this is consolidated and integrated into the acquisition of skills in analysis, application, adaptation and judgement gaining higher learning towards the end of the year. By year 3, the emphasis will be more on analytical synthesis and critical evaluation of information gathered to predict evidence-based treatment outcomes whilst excelling in clinical expertise. Trainees' performance throughout will be underpinned by attributes and behaviours that foster lifelong learning beyond the completion of the training.

The simplicity of the syllabus lay out is aimed at making it user friendly for both trainees and trainers. The syllabus is mapped to the speciality specific higher learning outcomes from the GDC curriculum¹. See Appendix 1 on page 38 below for the full list of the Specialty-Specific Higher Learning Objectives (HLOs) from the GDC specialty curriculum for Prosthodontics.

Training Progression

Training progression will be monitored throughout the 3 years. The longitudinal evaluation will be undertaken using programmatic assessment with low and high stakes, thus enabling the development of trainee capabilities and learning experience to be monitored continually throughout training. Formative assessment tools will provide the supporting evidence showing trainee progression moving away from a skill-based approach to a trainee centred/trainee led capability/competence evaluation mentored by the trainer over training duration.

Portfolios incorporating clinical case, learning and reflective logs are mandatory for monitoring the trainees learning. Completed case, learning and reflective logs which contribute to the trainee's self-awareness will underpin their personal development plans and are essential for monitoring personal growth. Supervised Learning Events (SLEs) which highlight the gaps in learning supported with workplace-based assessments (WPBAs) are essential for tracking the trainee's progressive learning and should include the following:

- Mini Clinical Evaluation Exercise (Mini CEX)
- Case Based Discussions (CBD)
- Directly Observed Practice Skills (DOPS)
- Evaluation of Clinical Events (ECE)
- Care Assessment Tool (CAT)
- Multisource Feedback (MSF)
- Multiple Consultant Reports (MCR)
- Entrustable Professional activities (EPAs)

Where appropriate the summative assessment at the end of each year will be the Annual Review of Competence Progression (ARCP) with submission of the documentation required onto the Intercollegiate Surgical Curriculum Programme. The end of training will be marked by the satisfactory completion of the Speciality Membership Examination of the Royal Colleges³.

Evidencing competencies

Theoretical Knowledge

- As evidence of their theoretical knowledge, trainees can use WBAs to record discussions involving specific topics.
- Trainees can also provide evidence of attendance at relevant courses and learning sessions with thorough reflection on the competencies achieved.
- Where available, specialty membership examination outcomes and ARCP feedback may also be provided as evidencing competencies.

Clinical Skills and Experience

As evidence of their clinical experience, trainees should record all treatment cases in their clinical logbook.

- It should be supported with a suitable number and range of Work Based Assessments (WBAs), which comprise most of the evidence that trainees will upload to their ISCP portfolio. Case Based Discussions (CBDs) and Clinical Evaluation Exercises (CEXs) are particularly useful as evidence of the competencies gained.
- Other WBA assessments include Assessments of Audit (AoA), Clinical Evaluation Exercises for Consent (CEXC), Direct Observations of Procedural Skills (DOPS), Observations of Teaching (OoT), and Procedure Based Assessments (PBAs).
- Further evidence can be provided by Multisource Feedback (MSF), patient surveys and Staff feedback from interdisciplinary planning and case review sessions.
- Where available, specialty membership examination outcomes and ARCP feedback may also be provided as evidencing competencies.

Domains

The key clinical domains outline the standards and describe the capabilities a trainee is expected to achieve over the duration of the three-year period of training demonstrating a longitudinal progression of learning and personal development in knowledge, skills and capabilities using an evidence-based approach.

The generic capabilities, which focus on professionalism, communication and leadership, underpin the specialty focussed clinical domains and the trainee must recognise and demonstrate an appreciation of their importance throughout their training. Trainees must also be familiar with the GDC's professionalism principles⁷ and embed and abide by them in their day-to-day practice. Trainees should also remember that where possible all assessment and management plans and strategies undertaken at patient or professional level should be evidence based and informed by relevant guidelines.

Each domain has subdomains with descriptors that provide guidance on the expected minimum standard of attainment a trainee should be aiming to achieve. The descriptors are intentionally left broad to allow flexibility within the training catering for the range of skill sets and capabilities of trainees. During year 1, it is expected that trainees will be more at the competency level where they are acquiring the set of knowledge, skills and abilities understanding their application and consolidating these as he/she progresses into the second and third years. During these years, it is expected that the trainee will gain competence in analysis and synthesis of information making judgements, decisions and evaluating outcomes, demonstrating that they are competent and capable by the end of their training to deliver services at the level of a specialist Prosthodontist. The trainee's learning journey should follow a spectrum of synchronous and asynchronous experiences to enrich their learning embedding the principles of lifelong learning into daily practice underpinned by professional attributes defined by the GDC's professionalism principles⁴.

The trainer will support and guide the trainee throughout their training, moving from a trainer supported journey during year one to a trainee led journey by year three. At the

end of the training, trainees will be proficient in the synthesis and analytical approach to the delivery of clinical patient care (figure 1):

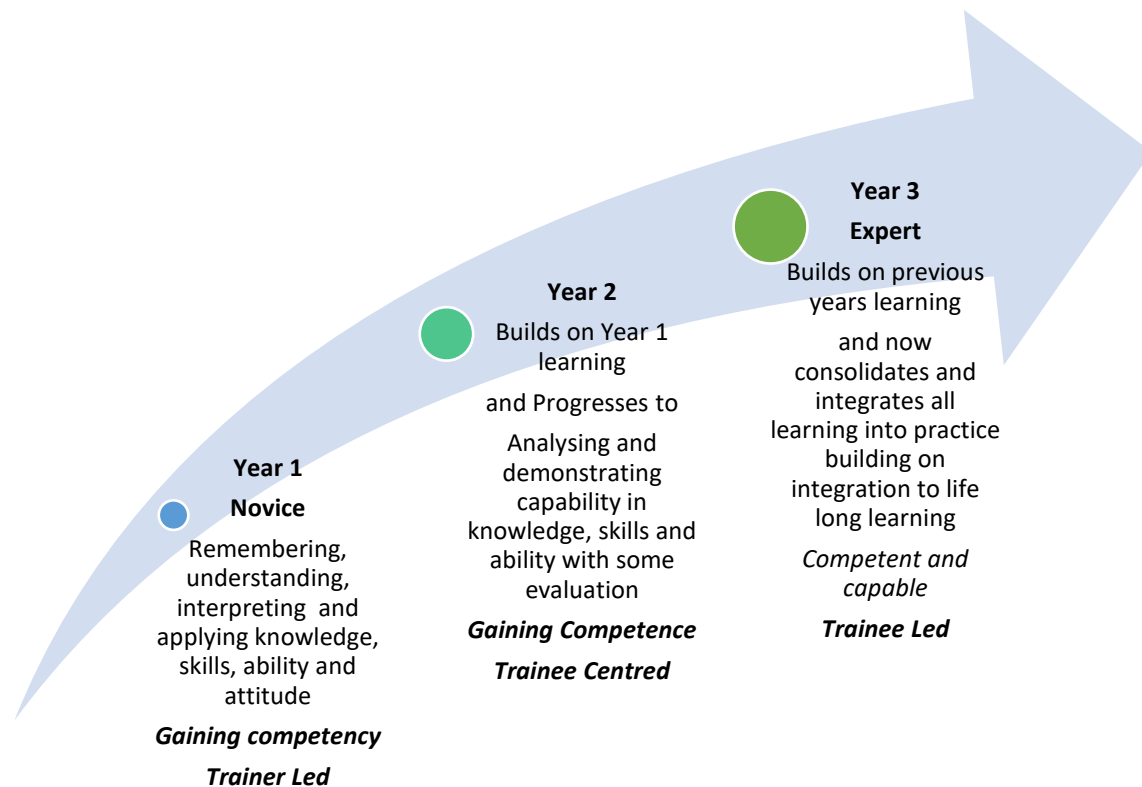


Figure 1: diagrammatic representation of trainee progression through training

The syllabus should ideally be delivered using a combination of theoretical, simulated and clinical placements. The balance of this will vary by provider accepting these variances as long as the end-product of a specialist in Prosthodontics, with the requisite knowledge, skills, abilities and capabilities to manage patients with specialist Prosthodontic treatment needs, is achieved. The contents of this clinical syllabus has encompassed some of these recommendations which also include the move towards a continuous longitudinal assessment of trainees.

1. Examination and Diagnosis

1.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe the biology, anatomy and physiology of the following, in both health and diseased states:
 - Relevant intra- and extra-oral structures including Enamel, dentinal-pulpal complex, periodontal and peri-implant tissues, alveolar bone, and occlusion.
 - Sequelae of congenital, developmental, and acquired conditions (namely caries, erosive tooth wear and tooth loss) on the dentition and supporting tissues.
- Discuss the influence of health and diseased states on:
 - Patient aesthetics and appearance
 - Function and stability of the natural dentition
 - Potential retention/support/stability of fixed/removable/implant Prosthodontics.
- Demonstrate knowledge and understanding of:
 - Relevant systemic factors that may impact Prosthodontic treatment provision.
 - Pain, physiology and clinical presentations of relevant oro-facial conditions namely hypoplastic/hypomineralisation conditions, caries, erosive tooth wear and acquired/congenitally missing teeth.
 - Clinical, radiological, and histological presentations of relevant conditions
 - Limitations, sensitivity and specificity of diagnostic tests for relevant conditions.
- Correlate health of intra- and extra-oral structures, tissues and prostheses to disease states and apply knowledge of basic sciences when assessing patients.

1.2 Clinical Skills and Experience

Trainees should be able to:

- Take a comprehensive patient history including presenting complaint and related history, and consider any relevant dental, medical and social factors.
- Complete a thorough examination of intra- and extra-oral structures and tissues including:
 - Extra-oral: TMJ, cervical and submandibular lymph nodes, muscles of mastication, assessment of swellings, changes in temperature, colour, or sensation.
 - Intra-oral: Soft tissues, muscles of mastication, assessment of swellings, mucosal colour or sensation, periodontal and peri-implant status, Erosive Tooth Wear, tooth colour, Dental Caries, occlusion, parafunction, restorability, risk assessment for oral cancer.

- Full assessment of the biological, functional and aesthetic quality of any existing fixed, removable or implant prostheses/restorations and the related structures.
 - Full occlusal examination, where appropriate using mounted study casts/intra-oral scans.
- Make an appropriate assessment of prognosis of teeth/restorations and restorability of teeth.
- Assimilate and synthesise information gained from the history, examination, clinical and special tests including radiological and digital imaging to arrive at diagnoses and prognoses of Prosthodontic care.

2. Clinical Investigation and Imaging

2.1 Underlying and Applied Knowledge

Trainees should be able to:

- Outline the related biology, anatomy, and/or physiology to know when clinical and radiological investigations are required.
- Explain the selection and justification of appropriate clinical and radiological investigation/s.
- Describe the value, relevance, and limitations of:
 - Periodontal and peri-implant examinations
 - Pulp vitality including sensitivity tests.
 - Crack detection techniques.
 - Clinical photography and smile/aesthetic analysis.
 - Occlusal examination including mounted study casts/diagnostic wax ups (or equivalent digital techniques)
 - Radiological imaging including 2D and 3D modalities.
- Explain the sensitivity and specificity of special tests and radiological imaging modalities.
- Explain the factors which may influence interpretation of special tests and radiographic images.

2.2 Clinical Skills

Trainees should be able to:

- Perform and interpret the findings of clinical investigations including:
 - Periodontal and Periradicular tests: palpation, percussion, tooth mobility, periodontal probing charting and indices, Pulp sensitivity tests: thermal and electric pulp testing and crack detection techniques.
 - Caries and Erosive Tooth Wear examinations and indices/screening tools.
 - Occlusal examination
 - Alveolar bone using appropriate classification systems and imaging techniques.

- Assessment of existing prosthesis, related tissues, and structures to evaluate the biological, functional and aesthetic outcome of the prosthesis.
- Perform/request and interpret the findings of radiographic investigations including:
 - Bitewing, periapical, and occlusal images.
 - Orthopantomograms
 - Cone beam computed tomography (with and without appropriate radiographic stents).
- Interpret radiographic images, intra-oral scans and clinical photographs to write accurate reports, and in producing standard sets of images to illustrate a course of treatment.
- Adhere to the relevant guidelines regarding the use of cone beam computed tomography.
- Use digital image technology and planning alongside conventional and digital imaging techniques for Prosthodontic diagnosis and care planning.

3. Development of Prosthodontic Treatment Strategies

3.1 Underlying and Applied Knowledge

Trainees should be able to:

- Explain the prognostic and risk factors for the various Prosthodontic treatment options and management strategies.
- Outline the likely outcomes for various treatment options in relation to healthcare system and financial constraints.

3.2 Clinical Skills

Trainees should be able to:

- Perform case selection based on risk assessment of various patient and tooth factors including medical history, patient compliance, and treatment complexity.
- Compare and communicate probable outcomes for various treatment options to the patient effectively, with respect to effect on oral health, quality of life, need for future supportive care, prevention, and maintenance.
- Choose the most appropriate dental materials, equipment and techniques based on current best available clinical evidence.
- Devise and implement treatment strategies for fixed and removable Prosthodontic treatment, including management of surgical and non-surgical options for Prosthodontic care.
- Work within a multi-disciplinary team with other clinicians involved in the care of the patient.
- Weigh treatment options against each other and communicate various options clearly to patients [and carers/parents] describing the pros and cons of each to enable the patient to be actively involved in informed and unbiased decision making, including appropriate management of patient expectations.
- Advise on the possible and probable outcomes of treatment options including the need for future supportive care, prevention and maintenance including the financial implications of this.

- Provide and communicate clear treatment plans for primary care practitioners and other dental specialists in relation to the provision of Specialist Prosthodontic treatment.
- Record contemporaneous and comprehensive clinical notes, including the patient history, results of clinical and radiological assessment, diagnosis, prognosis, restorability, discussion on risks and benefits of various treatment options, and treatment plan.
- Recognise personal limits, reflect, and seek help when necessary.

4. Health Promotion and Prevention of diseases

4.1 Underlying and Applied Knowledge

Trainees should be able to:

- Advise patients on appropriate preventive methods to manage primary dental diseases.
- Explain strategies to manage potential complications of primary diseases.
- Outline local, national, and international guidelines on prevention of primary dental disease and management of medically compromised patients.
- Describe the associations between oral and systemic diseases, including the connections between smoking, diet, and effective oral hygiene on the provision of specialist Prosthodontic care with stable and maintainable long-term outcomes.
- Demonstrate a thorough knowledge of the impact of general health on the future prognosis of oral structures and survival of restorations, including knowledge of how future growth might impact on Prosthodontic care for child patients.

4.2 Clinical Skills

Trainees should be able to:

- Communicate preventative advice for primary diseases including oral hygiene instruction (OHI), diet, parafunctional habits, and smoking cessation, with particular relevance to their importance in the disease prevention and long-term survival and maintenance of fixed, removable and implant Prosthodontics.
- Advise patients on the impact on their oral health status and quality of life following prevention and the need for supportive care and maintenance.
- Advise patients on the possible outcomes of non-compliance and the need for prevention, supportive care, and maintenance.
- Explain, motivate, engage and ensure patients' participation and compliance in their own oral care, including advice on how non-compliance affects outcomes and long-term oral health status.

- Recognise and manage common diseases/conditions of the peri-oral and dental hard and soft tissues, including dental caries, erosive tooth wear, denture related stomatitis, angular cheilitis and pulpal and periodontal involvement.
- Modify the demineralisation /remineralisation continuum with non-surgical preventative strategies.
- Make patient specific decisions for an appropriate care plan, taking patient-related factors into account including sensitivity to factors relating to ethnicity and diversity and how this may affect patient decisions and inclusivity for access to treatment.
- Use the evidence-base to inform strategies/decisions about caries removal/minimally invasive strategies and preventive management of Erosive Tooth Wear.
- Implement and, where necessary, discuss with the patient the relevant guidelines on prevention of primary dental disease and management of medically compromised patients.
- Plan treatment and manage medically compromised and special care patients as part of a multi-disciplinary team.

5. Interdisciplinary interfaces

5.1 Underlying and Applied Knowledge

Trainees should be able to:

- Explain patient and Prosthodontic treatment management for medically compromised patients.
- Describe, in relation to Prosthodontic-Periodontic interfaces:
 - Effect of periodontal disease and treatment on natural teeth and fixed/removable/implant Prosthodontics
 - Effect of relevant Prosthodontic conditions (namely caries and erosive tooth wear) on the periodontium and vice-versa
 - Assessment, diagnosis, and management of periodontal sequelae subsequent to Prosthodontic care.
 - Influence of periodontal and peri-implant disease and treatment on the outcome of fixed/removable/implant Prosthodontics.
 - The provision of aesthetic/functional crown lengthening surgery to facilitate Prosthodontic care.
 - Assessment of gingival and periodontal aesthetics in relation to planned Prosthodontic care.
- Describe, in relation to Prosthodontic-Endodontic interface:
 - The evidence for the use of endodontically treated teeth as bridge and partial denture abutments.
 - The biological rationale, and indications for non-surgical and surgical endodontic treatment prior to Prosthodontic treatment.
 - The role of endodontic treatment in preservation/regeneration of alveolar bone for future dental implants.
 - The principles of restoration of root filled teeth including the use of post and cores to retained fixed Prosthodontic restorations.
- Describe, in relation to the Prosthodontic-Orthodontic interface:

- Effect of orthodontic tooth movement on Prosthodontic care, including aesthetic issues, management of Erosive Tooth Wear, occlusal disorders and prior to dental implant therapy.
- Orthodontic management for traumatised teeth requiring Prosthodontic care.
- Prosthodontic management of teeth prior to or during planned orthodontic treatment.
- Role, indications, technique, and outcome of autotransplantation.
- Procedure for forced eruption of teeth for restorative needs e.g. management of fractured teeth, subgingival caries, and perforation repair.
- Effect of orthognathic surgery on Prosthodontic care.
- The role of combined orthodontic and Prosthodontic care for management of patients with developmental conditions namely hypodontia and microdontia.
- An understanding of Orthodontic Retention Strategies after completion of combined orthodontic and Prosthodontic care.
- Describe, in relation to Prosthodontic-Oral Surgery interfaces:
 - The indications, contraindications and technique for block grafting, socket preservation, sinus lift, and guided-bone regeneration, and associated complications.
 - Immediate provision of tooth, mucosa or implant supported restorations after exodontia.
- Explain, in relation to the multidisciplinary care, the management of patients with:
 - Special needs
 - Complex dental trauma
 - Temporomandibular disorders
 - Caries and Erosive Tooth Wear.

5.2 Clinical Skills

Trainees should be able to:

- Co-ordinate and manage patients requiring the input of other dental and/or medical specialist colleagues in the planning and delivery of integrated care with a specific focus on care required before, during and after Prosthodontic treatment.

- Assess of the restorability of teeth including endodontically and periodontally involved teeth, and plan and provide appropriate restoration of these teeth, bearing in mind how this may affect long term Prosthodontic outcomes.
- Communicate clear care plans to colleagues, including other dental specialists and primary care practitioners, where appropriate.
- Demonstrate holistic planning and management skills in dealing with teeth that are unrestorable and/or with uncertain prognosis, including assessment of teeth requiring pre-Prosthodontic endodontic or periodontal treatment or plan the extraction and appropriate Prosthodontic replacement.
- Plan and provide follow-up and oversight of long-term management of patients who have received Prosthodontic care, including appropriate liaison with primary care practitioners and the practice of monitoring and maintenance of the restored dentition.
- Communicate effectively with patients, including describing the advantages and disadvantages of interdisciplinary treatment options including the possible alternatives and potential complications, maintenance, and cost implications.

6. Fixed Prosthodontics

6.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe the relevant equipment, techniques, materials and technologies available for all types of direct and indirect dental restorations and fixed dental prostheses, in relation to both management of natural teeth requiring full and partial coverage restorations and restoration of dental implants with fixed Prosthodontics.
- Describe the principles of tooth preparation for direct and indirect restorations and fixed dental prostheses.
- Describe the indications, management options and expected outcomes for teeth requiring fixed Prosthodontics.
- Describe procedures involving caries management, endodontic treatment and periodontal therapy prior to restoration of natural teeth, including the restoration of root filled teeth.
- Describe the dental laboratory techniques and the supplementing clinical procedures required to produce fixed and removable prostheses, including the laboratory requirements for provision of inlays, onlays, crowns, bridges, partial and complete dentures.
- Describe the use of dental implants, adhesive and digital technology in fixed Prosthodontics and how appropriate materials selection relates to treatment options and tooth preparation and the response of the dental tissues to treatment.
- Describe the response of periodontium and dental pulp to fixed Prosthodontic procedures, dental materials, and coronal microleakage.
- Describes the relevant articulator type required for specific cases, including the need for semi-adjustable and fully adjustable articulators and a knowledge of digital technologies within the subject of articulation.
- Describes the provision of implant supported fixed restorations, including the importance of Prosthodontically led planning, the use of CBCT imaging, surgical implant placement and simple grafting techniques, and aesthetic and functional restoration of implants.

- Describe features of appropriate recall schedule following restoration of natural teeth and implants using fixed Prosthodontics.
- Describe features of a successful outcome following restoration of natural teeth and implants using fixed Prosthodontics.
- Explain the management options in the face of treatment failure or uncertainty.

6.2 Clinical Skills

Trainees should have the clinical skills to be able to perform fixed Prosthodontic procedures safely, competently, and effectively. In doing so they should:

- Prepare teeth to a high standard bearing in mind the material and design of the planned prosthesis, the biological cost and the mechanical principles involved, including a thorough knowledge of the use of adhesive techniques and how these may be employed to preserve tooth tissue
 - Manage soft tissues appropriately during operative procedures and whilst planning and designing restorations so as to safeguard periodontal health and create aesthetic and cleansable restorations, including implant supported restorations
 - Provide appropriate provisional restorations for intermediate stages of treatment
 - Obtain accurate impressions for manufacture of all types of indirect fixed restorations and understand when various techniques are applicable, including conventional and digital techniques
 - Assess and accurately record static and dynamic occlusion and have an understanding of how occlusion affects the design and survival of restorations
 - Competence in using facebow and articulation and in the production of diagnostic wax ups when planning either conformative or reorganised occlusal schemes. Be able to transfer this information usefully to a clinical situation for the planning and execution of simple to complex cases
 - Communicate clearly and effectively with laboratory technicians
 - Try-in, fit and adjust restorations using appropriate cements ensuring that appearance, occlusion and function are in harmony with the remaining dentition and patient's wishes. Monitor and evaluate the effectiveness of fixed Prosthodontic treatment.

- Communicate effectively with patients, including describing the advantages and disadvantages of treatment options, including the possible alternatives and potential complications, maintenance and cost implications.
- Assess the outcome of Fixed Prosthodontic Care including the need for further intervention in the face of an unsatisfactory or uncertain outcomes.
- Communicate and liaise effectively with general dental practitioners, specialist colleagues, and/or DCPs regarding the provision of Fixed Prosthodontic Care including the provision of treatment plans, recall schedules.

7. Removable Prosthodontics

7.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe the materials and technologies available for all types of removable dental prostheses.
- Describe the principles of partial denture design and the use of surveyed casts to plan retentive features such as clasps and connectors, bearing in mind the materials used for these and how these impact on design elements.
- Describe where implant supported removable prostheses may be indicated to improve outcomes.
- Describe the relevance and inter-relationship of removable Prosthodontic treatment to overall restorative care and long-term maintenance and function, with particular emphasis on the potential impact of removable prostheses on dental, mucosal implant and periodontal health and on patient well-being and self-esteem.
- Describe the laboratory requirements for restorations & show effective communication with laboratory technicians.

7.2 Clinical Skills

Trainees should have the clinical skills to be competent and able to performing Removable Prosthodontic treatment procedures safely, competently, and effectively. In doing so they should:

- Provide treatment plans for primary care practitioners in relation to provision of removable Prosthodontic treatment.
- Plan and provide dentures using appropriate clinical and technical procedures.
- Assess and accurately record static and dynamic occlusion and have an understanding of how occlusion affects the design, survival and function of removable restorations.
- Be competent in using facebow and articulation and in the production of diagnostic wax-ups when planning occlusal schemes, reorganised occlusion and planning fixed – removable solutions.

- Survey casts to optimise the design of removable prostheses.
- Communicate clearly and effectively with laboratory technicians.
- Transfer laboratory based information usefully to a clinical situation for the planning and execution of simple to complex cases.
- Plan and carry out appropriate tooth preparations or pre-prosthetic tissue management with reference to the design of the final prosthesis.
- Obtain accurate impressions of the hard and soft tissues in order to achieve optimal fit and comfort of removable restorations.
- Fit restorations ensuring that appearance, occlusion and function are in harmony with the remaining dentition, facial tissues and patient's wishes.
- Be able to effectively manage removable Prosthodontic complications, including denture related stomatitis.
- Communicate in an effective and timely manner with relevant clinicians and with patients on prognosis, appropriate replacement of removable prostheses, and the need for monitoring/supportive treatments.
- Communicate with the patient on aftercare including advice regarding analgesics, oral hygiene, and diet for the interappointment period and/or post-operatively.
- Advise and arrange further restorative or supportive treatments and appropriate recall schedules to monitor outcome of removable Prosthodontic treatment and associated abutment teeth / dental implants.
- Advise and arrange monitoring for uncertain outcomes, and further treatment for failure cases, including referral to other disciplines as appropriate.

8. Implant Prosthodontics

8.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe the importance of Prosthodontically led implant planning and surgical placement.
- Explain the evolution of dental implants, including endo-osseous implants, their differences and compare and contrast the range of systems including materials, types, design, configuration and components.
- Explain, describe and discriminate between the anatomy, biology and histopathology at the cellular level of peri-implant tissues and periodontal tissues.
- Describe the concept of osseointegration, differentiate between the factors affecting osseointegration and evaluate their impact on clinical outcomes.
- Describe and illustrate an understanding and application of the soft tissue healing around dental implants and their transmucosal components.
- Recognise and classify different surgical and prosthetic implant components, their rationale and application.
- Recognise and explain the anatomical limitations of, and shows an understanding of, the need for sinus augmentation to facilitate implant placement and the associated risks.
- Recognise and execute the appropriate non-surgical and surgical interventions to manage peri-implant disease.
- Demonstrate knowledge and applications of extra-alveolar implants e.g. zygomatic implants in the oral rehabilitation of patients.
- Formulate appropriate treatment plans for implant retained or supported fixed and removable prostheses, including working as part of a multi-disciplinary team to achieve optimum outcomes for the patient.
- Consider and apply the relevant theoretical and clinical techniques and principles in common with conventional Prosthodontics including materials science, occlusion, laboratory techniques and communication as outlined in the relevant sections.

- Demonstrate an understanding of the maintenance and cost implications of treatments involving implants and current guidelines applicable to provision of such treatment.
- Discuss the practical use of conventional and digital surgical guides to assist in optimal surgical implant placement.
- Describe different outcome measures following implant Prosthodontics, an appropriate recall schedule to monitor outcomes and further intervention in the case of failure or uncertainty.

8.2 Clinical Skills

Trainees should have the clinical skills to be able to demonstrate applied knowledge and clinical competence in the provision of fixed and removable implant procedures safely, competently, and effectively. In doing so they should:

- Perform a thorough implant assessment, evaluate case complexity including relevant patient, tooth-specific and implant site factors, and determine the prognosis to help select and plan patient care.
- Communicate with the patient explaining the indication, procedure, risk, challenges and expected outcome for implant Prosthodontics.
- Discuss with the patient alternative options for replacement of missing teeth including extraction without replacement, conventional fixed and removable Prosthodontics and their associated risks and limitations.
- Prescribe, justify, and interpret plain radiographic and CBCT imaging, including the design and construction of radiographic guides to aid planning of number, position of fixtures and the reporting and interpretation of the images acquired.
- Design, construct and deliver provisional and definitive implant-retained or implant-supported prostheses for optimal aesthetic and functional restoration of implants.
- Discuss the need for additional procedures such as managing the soft tissues around implants with the use of provisional restorations and abutments and evaluate the need for soft tissue augmentation procedures.
- Appropriately select implant components, instruments, techniques, and dental materials based on clinical and radiological findings, for laboratory and clinical stages

to minimise the risk of procedural errors and optimise the outcome of implant Prosthodontics.

- Perform surgical implant placement and simple grafting techniques including soft tissue management, obtaining accurate impressions of implants, and hard and soft tissues in order to achieve optimal fit of restorations.
- Differentiate between the types of augmentation, devising a plan that reflects knowledge and understanding of the predicted outcome.
- Formulate and undertake the agreed surgical treatment along with augmentation taking into consideration the patient-related factors.
- Prepare for and have the foresight and ability to manage unforeseen complications during surgical placement.
- Interpret and draw a mitigation plan and manage post-surgical complications.
- Effectively monitor and evaluate of the effectiveness of implant rehabilitations, including appropriate maintenance regimes and management of peri-implantitis and complications associated with restorations.
- Communicate in an effective and timely manner with relevant clinicians and with patients, including describing the advantages and disadvantages of implant treatment including the possible alternatives and potential complications, maintenance and cost implications.

9. Temporomandibular Disorders (TMDs)

9.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe the relevant biology, anatomy, physiology, pathology and radiology in provision of care and advice for TMDs.
- Describe the current and seminal literature on diagnosis and management of these disorders.
- Describe the different treatments available for TMD and recognises limitations (jaw exercises, inter-occlusal appliances, registration techniques, deprogramming devices, occlusal adjustment, conformative and reorganised approaches to oral reconstruction, psychological, pharmacological and surgical approaches).

9.2 Clinical Skills

Trainees should have the clinical skills to be able to diagnose and manage Temporomandibular disorders competently and effectively. In doing so they should:

- Communicate effectively and empathically with patients to identify potential aetiological factors and signs and symptoms of TMD and to provide behavioural advice for the management of these problem where appropriate.
- Communicate and work with colleagues on the multidisciplinary management of these problems.
- Diagnose oral parafunction and other factors in the development of dysfunction of mandibular movements and the TMJs.
- Construct appropriate occlusal appliances for the diagnosis and treatment of TMD problems.
- Recognise the relevance of treatment of TMD problems on overall patient care, long term function and survival of restorations and on patient well-being.
- Monitor and evaluate the effectiveness of treatment regimes in conjunction with other specialists/ dental care professionals managing the patient.

10. Erosive Tooth Wear

10.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe the relevant anatomy, physiology, pathology, microbiology and technical requirements in the management of erosive tooth wear.
- Describe the current and seminal literature on the risk assessment, aetiology and preventive management of erosive tooth wear.
- Describe the consequences of tooth preparation in the worn dentition and an applied knowledge of how to restore the worn dentition, bearing in mind the biological cost associated with this and how appropriate materials selection relates to treatment options.
- Describe the appropriate techniques, materials and technologies available to provide the relevant treatment to manage tooth wear, including the response of the dental tissues to treatment, and where appropriate surgical procedures such as crown lengthening may be indicated.
- Have an understanding of how occlusion affects the design, survival and function of fixed and removable restorations, and where occlusal changes can be employed.
- Describe the use of facebow and articulation and in the production of diagnostic wax ups when planning occlusal schemes, including reorganised occlusal schemes and planning fixed – removable solutions.
- Describe how to transfer this information usefully to a clinical situation for the planning and execution of restorations for complex tooth wear cases.
- Describe the effect of Prosthodontic treatment of Erosive Tooth Wear on pulpal and periodontal health and pathology and patient well-being and self-esteem
- Describe the laboratory requirements for indirect and direct restorations for Erosive Tooth Wear.

10.2 Clinical Skills

Trainees should have the clinical skills to be able to perform the surgical endodontic procedures safely, competently, and effectively. In doing so they should:

- Communicate effectively and empathically with patients to obtain an appropriate history in order to identify aetiological factors, signs and symptoms of erosive tooth wear and to provide behavioural advice for the prevention and management of aetiological factors involved in erosive tooth wear.
- Formulate appropriate care plans for the management of erosive tooth wear, bearing in mind patient wishes and concerns, a full assessment of the worn dentition, including an occlusal assessment and an appreciation of the factors which may affect the decision to select fixed or removable solutions, or a combination of these treatment modalities.
- Prescribe adhesive techniques to preserve tooth tissue, with an applied understanding of the relevance and inter- relationship of adhesive and conventional restorations in the Prosthodontic treatment of erosive tooth wear.
- Assess and accurately record static and dynamic occlusion to provide restorations to address the loss of tooth structure resulting from erosive tooth wear, and to minimise further destruction of tooth tissue.
- Prepare teeth for direct and indirect restorations and be able to execute this to a high standard.
- Plan and execute surgical crown lengthening procedures where appropriate or liaise appropriately with periodontal specialist colleagues the provision of this treatment.
- Provide appropriate provisional restorations for intermediate stages of treatment.
- Obtain accurate impressions for manufacture of all types of fixed and removable restorations and understand when various techniques are applicable, including conventional and digital techniques.
- Try-in, fit and adjust restorations using appropriate cements ensuring that appearance, occlusion and function are in harmony with the remaining dentition and patient's wishes.
- Monitor and evaluate the effectiveness of treatment for tooth wear and to devise maintenance plans following erosive tooth wear rehabilitation.
- Provide treatment plans for primary care practitioners in relation to provision of removable Prosthodontic treatment.

- Communicate effectively with colleagues and provide treatment plans for primary care practitioners in the management and prevention of erosive tooth wear.
- Show effective communication with laboratory technicians.
- Liaise with medical professionals for the investigation and management of medical issues related to the pathophysiology of the patient's erosive tooth wear, including but not limited to, clinical psychology, gastroenterology and general medical practitioners.

11. Aesthetic dentistry

11.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe the relevant dental anatomy, tooth morphology and tooth proportion in relation to aesthetic dental restorations, including soft tissue factors such as gingival aesthetics, lip support, vertical dimension and where liaison with other specialties may be indicated, such as periodontal and orthodontic care planning.
- Describe aesthetic principles when providing all types of fixed and removable prostheses including applied knowledge and clinical skills described in the relevant other sections of the curriculum in:
 - Preparation of teeth for direct and indirect restorations, using the skills and principles.
 - Appropriate material for direct and indirect restorations.
 - Providing appropriate provisional restorations for intermediate stages of treatment.
 - Fitting of restorations using appropriate adhesives or cements ensuring that appearance, occlusion and function are in harmony with the planned occlusal scheme, remaining dentition and patients wishes.
 - Understanding the potential effects of veneers and other direct and indirect restorations on pulpal and periodontal health and pathology and patient well-being and self-esteem.

11.2 Clinical Skills

Trainees should have the clinical skills to be able to diagnose and manage dental trauma competently and effectively. In doing so they should:

- Communicate effectively and empathetically with patients, including effective history taking and describing the advantages and disadvantages of aesthetic dental treatment, including the possible alternatives and potential complications, maintenance and cost implications.

- Plan and provide dental procedures for managing changes in tooth colour, shape and position.
- Use of appropriate techniques, materials and technologies available for altering tooth colour, proportion and position including:
 - Tooth whitening techniques for vital and non-vital teeth
 - Use of micro- and macro- abrasion
 - Use of gingival masks to manage gingival recession
 - Use of resin infiltration systems for the management of alteration in tooth colour
- Understanding the laboratory requirements for aesthetic restorations and show effective communication with laboratory technicians for the provision of aesthetic indirect restorations.
- Communicate effectively to provide care plans for primary care practitioners in relation to aesthetic procedures.
- Formulate maintenance plans for patients who have undergone aesthetic procedures.

12. Materials Science

12.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe knowledge of material science and ability to select a material for a particular use within Prosthodontics.
- Discuss the advantages and disadvantages of material use in differing clinical scenarios.
- Discuss the potential consequences of choosing an inappropriate material for a particular Prosthodontic treatment.
- Discuss the potential adverse effects on a patient of the use of a material.
- Discuss the laboratory requirements for materials and the importance of effective communication with laboratory technicians for the provision of indirect restorations constructed with different materials or techniques.
- Discuss the requirements for tooth preparation for the specific materials for a planned restoration, with an applied understanding of the relevance and inter- relationship of materials used for adhesive and conventional restorations in the Prosthodontic treatment.
- Understand and evaluate the cost-benefit of a variety of dental materials used within Prosthodontics.

12.2 Clinical Skills

Trainees should have the clinical skills to be able to select dental materials competently and effectively during Prosthodontic management of patients. In doing so they should:

- Be able to prescribe dental materials for any particular use within Prosthodontics.
- Select the correct technique for use/manipulation for each material.
- Adhere to relevant personal protective and cross-infection protocols during the use of dental materials.
- Interpret and apply local, national and international guidelines to manage safe use, side effects or adverse reactions to dental materials.

- Advise and communicate to patients, parents, or guardians the different options, advantages and disadvantages and alternatives to a specific dental material.

13. Dental Traumatology

13.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe the relevant biology and anatomy of the oro-facial region necessary for the assessment of dental trauma.
- Describe and apply knowledge of the anatomy and biomechanics of the head and neck, including oral hard and soft tissues, including the dentition.
- Recognise and classify facial fractures, soft tissue, dentoalveolar and tooth injuries, and dental resorption.
- Explain the immediate, medium, and long-term management of, and outline the sequelae of traumatic dental injuries.
- Describe the consequences of traumatic dental injuries to the primary and secondary dentition including the consequences of optimal and suboptimal management.
- Describe the consequences on the pulp-dentine complex resulting from dental traumatic injury.
- Describe the biology of wound and fracture healing, and tooth revascularisation.
- Describe the biomechanics of fracture fixation, limitation of non-physiological tooth movement and splinting.
- Describe the various modes of tissue healing of root fractures.
- Recognise the limitations of tissue repair following severe trauma and/or sub-optimal management.
- Describe the pathogenesis of internal and external resorption including surface, inflammatory and replacement types.

13.2 Clinical Skills

Trainees should have the clinical skills to be able to diagnose and manage dental trauma competently and effectively. In doing so they should:

- Advise regarding emergency management of dental trauma

- Manage the acute phase of trauma, including repositioning of avulsed/traumatised teeth, provision of an appropriate stabilizing splint, provisional restorations, and endodontic skills to the level of a skilled general dental practitioner.
- Assess hard and soft tissues and compose an appropriate care plan.
- Assess restorability of traumatised teeth and discuss all treatment options with a patient
- Provide appropriate restorations for traumatised teeth.
- Recognise the need to work with other clinicians in the provision of care and liaises appropriately with colleagues from other specialties as appropriate.
- Demonstrate the ability to interpret radiographic images in assessing the trauma and ongoing monitoring of affected structures.
- Communicate effectively and empathetically with trauma patients, including effective history taking and describing the advantages and disadvantages of dental treatment, including the possible outcomes, alternatives, potential complications, maintenance and cost implications.

14. Digital Dentistry

14.1 Underlying and Applied Knowledge

Trainees should be able to:

- Describe and apply knowledge of the anatomy and biomechanics of the head and neck, including oral hard and soft tissues, including the dentition, necessary for the use of digital dentistry.
- Describe the advantages and disadvantages of use of digital and conventional technologies and where to use each appropriately.
- Describe digital laboratory techniques, their advantages and limitations.
- Describe how digital technology can be used to enhance effective patient communication, including its use in patient education and information.

14.2 Clinical Skills

Trainees should have the clinical skills to be able to use digital dentistry during the provision of Prosthodontic care competently and effectively. In doing so they should:

- Use digital technologies in patient assessment and planning care.
- Use digital and/or conventional technologies in different aspects of care planning and to integrate their use as appropriate, including digital impression taking, planning and design of restorations.
- Select and use CAD/CAM and additive technologies where appropriate.

15. Research

15.1 Underlying and Applied Knowledge

Trainees should be able to:

- Demonstrate knowledge in the different types of research investigation, and in the hierarchy of research evidence, and critically appraise the evidence.
- Describe seminal and current research relevant to Prosthodontics and able to critically appraise and apply appropriately to clinical situations.
- Understand the importance of and comply with research governance.
- Demonstrate skills in writing reports, articles and in preparing and altering manuscripts where appropriate.
- Present research work to professional colleagues in the workplace, or at specialist meetings.
- Understand the process of peer review in scientific publications.

15.2 Clinical Skills

Trainees should have the clinical skills to be able to use research during the provision of Prosthodontic care competently and effectively. In doing so they should:

- Utilise evidence-based dentistry in the planning, execution and self-reflection of Prosthodontic clinical work.

Appendix 1 Specialty-Specific Higher Learning Objectives (HLOs) from the GDC specialty curriculum for Prosthodontics

1.	Examination and Diagnosis
	a. Demonstrate competence to independently undertake, record and interpret a detailed history and examination of patients requiring management with simple and complex Prosthodontics. (HLO 5.1)
	b. From this information they will be able to provide an accurate and comprehensive dental and Prosthodontic diagnosis. (HLO 5.1)
2.	Clinical investigation and imaging
	a. Demonstrates competence in the application of clinical imaging (radiography, including digital radiography and photography) as it relates to the dental management of patients with fixed or removable Prosthodontics and conservative dentistry either independently or in collaboration with other clinicians. (HLO 5.14)
3.	Development of Prosthodontic treatment strategies
	a. Demonstrates independently how they determine and plan treatment strategies for patients requiring management that involves simple and/or complex Prosthodontic rehabilitation; including when/if to require input from other specialties. (HLO 5.2)
4.	Health promotion and prevention of diseases
	a. Demonstrates competence to integrate health promotion and prevention of diseases affecting the dental hard and soft tissues in patients who they manage with simple and/or complex Prosthodontics (HLO 5.3)
5.	Interdisciplinary interfaces

	a. Demonstrates independently how they determine and plan treatment strategies for patients requiring management that involves simple and/or complex Prosthodontic rehabilitation; [including when/if to require input from other specialties]. (HLO 5.2)
	b. Demonstrates competence to integrate and are effective in providing specialist Prosthodontic input to interdisciplinary interfaces that provide whole patient oral healthcare. (HLO 5.4)
6.	Fixed Prosthodontics
	a. Demonstrates competence in the provision of simple and complex fixed Prosthodontics in the comprehensive management of patients either independently or in collaboration with other clinicians. (HLO 5.5)
7.	Removable Prosthodontics
	a. Demonstrates competence in the provision of simple and complex removable Prosthodontics in the comprehensive management of patients either independently or in collaboration with other clinicians. (HLO 5.6)
8.	Implant Prosthodontics
	a. Demonstrates competence in the provision of simple and complex removable and fixed implant supported Prosthodontics in the comprehensive management of patients either independently or in collaboration with other clinicians. (HLO 5.7)
9.	Management of Temporomandibular Disorders (TMDs)
	a. Demonstrates competence in the management of patients diagnosed with Temporomandibular disorders (TMDs) either independently or in collaboration with other clinicians. (HLO 5.8)
10.	Erosive Tooth Wear (ETW)
	a. Demonstrates competence in the prosthetic and conservative dental management of patients diagnosed with Erosive Tooth Wear either independently or in collaboration with other clinicians. (HLO 5.9)
11.	Aesthetic Dentistry

	a. Demonstrates competence in the aesthetic dental management of patients with fixed or removable Prosthodontics and conservative dentistry either independently or in collaboration with other clinicians. (HLO 5.10)
12.	Materials Science
	a. Demonstrates a comprehensive knowledge and understanding of materials science as related to the management of patients with Prosthodontics. (HLO 5.11)
13.	Dental traumatology
	a. Demonstrates competence in the Prosthodontic management of patients who have experienced dental trauma with fixed or removable Prosthodontics and conservative dentistry either independently or in collaboration with other clinicians. (HLO 5.12)
14.	Digital Dentistry
	a. Demonstrates competence in the application of digital dentistry as it relates to the dental management of patients with fixed or removable Prosthodontics and conservative dentistry either independently or in collaboration with other clinicians. (HLO 5.13)
15.	Clinical Research
	a. Demonstrates a comprehensive knowledge and understanding of the research that underpins the management of patients with fixed and removable Prosthodontics and conservative dentistry (HLO 5.15)

References

1. General Dental Council Prosthodontics Specialist Training Curriculum
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2. The Specialty Membership Examination in Prosthodontics of the Royal College of Surgeons
3. General Dental Council Standards for Specialty Education [standards-for-specialty-education_201957938ec311144e9ba74d9565d7b1b118.pdf \(gdc-uk.org\)](#)
4. General Dental Council Principles for Professionalism [Principles of professionalism \(gdc-uk.org\)](#)