

**GENERIC OCCUPATIONAL STANDARDS FOR DENTAL TECHNOLOGY  
STANDARDS PACK FOR  
PROSTHETIC CUSTOM-MADE DENTAL DEVICES  
January 2006**

**Background**

This is one of four packs containing the detailed draft Generic Occupational Standards for dental technology. They are:

1. Initial Assessment, Preparation and Advice
2. Prosthetic custom-made dental devices
3. Restorative custom-made dental devices
4. Orthodontic custom-made dental devices.

This pack contains the following:

PROSTHETIC DEVICES	
EDT05	Produce and prepare casts, baseplates and occlusal registration rims for removable prostheses
EDT06	Design and manufacture complete removable prostheses
EDT07	Design and manufacture partial removable prostheses
EDT08	Design and manufacture cast and wrought metallic components and cast frameworks for removable prostheses
EDT09	Reline, rebase, repair and modify removable prostheses
EDT10	Design and manufacture obturators
EDT11	Design and manufacture implant-based prostheses
EDT12	Design and manufacture prostheses using precision attachments
Knowledge and understanding that individuals need to develop and apply to meet the standards	

You have two main tasks to do in relation to these standards. You should do these in the order given.

1. Check the translation
  - a) Is the translation accurate?
  - b) Is it understandable in your country?
  - c) If not, what language should be used?
  - d) If unsure, check with the UK expert group, what the correct meaning is in English.
2. Verify the standards
  - a) Do the draft standards describe best practice in your country?
  - b) If not, what is best practice in your country – please provide detailed information on what should be changed and why.

We need to develop European standards that work in every country and every language. As there can only be one standard, we will all need to compromise.

**UNIT**

**EDT05 Produce and prepare casts, baseplates and occlusal registration rims for removable prostheses**

**Information about this unit**

This unit focuses on producing and preparing casts, baseplates and occlusal registration rims for removable prostheses - simple complete, complex complete, simple partial, complex partial.

**Scope of the standards**

- 1 Removable prostheses:
  - a) simple and complex complete
  - b) simple and complex partial
  - c) cast and wrought metallic components and cast frameworks.
  
- 2 Materials:
  - a) self cure polymeric
  - b) light cure polymeric
  - c) thermo-formed materials
  - d) heat cure polymeric.
  
- 3 Casts:
  - a) master casts
  - b) opposing casts
  - c) duplicate casts.

## Performance criteria

### The worker will need to:

- 1 correctly determine the prescription requirements from the information available
- 2 effectively clean and disinfect the received impression, confirm that it is free of voids or defects which render it unacceptable and prepare it appropriately to receive the cast material<sup>1</sup>
- 3 inform the client in an appropriate manner if the impression is not of sufficient quality and obtain a replacement impression
- 4 correctly prepare cast material that is appropriate for:
  - the process which will be used to manufacture the final prosthesis
  - the nature of the impression material
- 5 pour the cast material correctly into the impression and produce a cast that:
  - provides an accurate positive image of the impression
  - includes the detail and area that is required to make the prosthesis
  - is dense
  - is free from voids or other visible defects
- 6 trim the cast so that:
  - its base is level
  - sides are free from extraneous material, and
  - essential anatomical detail is retained
- 7 make any further small adjustments to the cast that are necessary for the next stage of the process
- 8 survey the cast to identify the position and size of undercuts, determine an appropriate path of insertion for the planned prosthesis and block out any unsuitable undercuts
- 9 apply prescribed materials to the relevant cast to form a rigid baseplate of the appropriate extension adding appropriate material when the baseplate needs strengthening
- 10 form a wax occlusal rim, place it in the correct position on the baseplate and apply additional wax to attach the rim firmly to the baseplate
- 11 smooth and shine the non-fitting surfaces of materials and make sure that the peripheral edges conform to the patient's anatomy and are smooth and free of debris
- 12 check the completed baseplate and occlusal registration rim to confirm that they:
  - will not damage surrounding tissues in the patient's mouth
  - are fit for purpose
- 13 effectively clean and disinfect the occlusal registration rim, correctly identify it with the patient's unique reference and date of production, prepare and package it safely for despatch to the client at the agreed time

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<sup>1</sup> Preparation of the impression may include the incorporation of laboratory analogues or transfer components.

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- 14 correctly identify the cast with the patient's unique reference
- 15 store the casts in an appropriate safe manner and place when they are not in use.

## UNIT

### EDT06 Design and manufacture complete removable prostheses

#### Information about this unit

This unit focuses on the design and manufacture of complete removable prostheses - polymeric dentures. These are dental devices which are custom-made to fit the patient's unique mouth shape and which replace the complete set of upper and/or lower teeth. The prosthesis may be simple or complex.

There are three elements

EDT06.1 Design, manufacture and modify trial complete removable prostheses

EDT06.2 Manufacture final complete removable prostheses

EDT06.3 Trim, polish, finish and evaluate complete removable prostheses

#### SCOPE OF THE STANDARDS

- 1 Articulators:
  - a) adjustable
  - b) fixed condylar path.
  
- 2 Artificial teeth:
  - a) polymeric
  - b) porcelain.
  
- 3 Occlusion:
  - a) lingualised occlusion
  - b) variations in occlusal forms
  - c) neutral zone occlusion.
  
- 4 Polymeric material:
  - a) heat cure
  - b) self cure
  - c) light cure.
  
- 5 Introduce polymeric material in to the mould by:
  - a) pouring
  - b) injection
  - c) conventional packing.

**Element**

**EDT06.1 Design, manufacture and modify trial complete removable prostheses**

**Performance criteria**

**The worker will need to:**

- 1 effectively clean and disinfect the returned occlusal registration rim and baseplate and transfer registration information accurately to the cast
- 2 mount the cast on an appropriate articulator, articulate it correctly and consistently with any available occlusal registration information and record the necessary information correctly
- 3 transfer registration information accurately to the cast, modify, position and attach the prescribed artificial teeth to the baseplate in a manner that produces:
  - occlusion and articulation appropriate to the patient's recorded jaw relationship
  - the required aesthetic appearance
  - a prosthesis which maximises retention, stability and support
  - maximum masticatory efficiency
- 4 shape and contour the supportive wax consistent with the patient's musculature
- 5 clearly and accurately identify trial removable prosthesis with the patient's unique reference and date of production
- 6 effectively clean and disinfect the trial removable prosthesis, prepare and package it safely for despatch and return it to the client at the agreed time
- 7 effectively clean and disinfect the returned trial removable prosthesis and identify from the client's instructions any modifications which are required
- 8 check the returned trial prosthesis for loosening or movement of teeth which may have occurred during try-in and make any adjustments that are necessary
- 9 fit the returned trial prosthesis to the cast if it needs to be modified, articulate it if this is required and make the required modifications
- 10 repeat the processes of modifying the prosthesis and returning it to the client for a try-in until a satisfactory prosthesis is achieved.

**Element**

**EDT06.2 Manufacture final complete removable prostheses**

**Performance criteria**

**The worker will need to:**

- 1 evaluate the prescription, the casts, the design and the modified trial prosthesis and decide:
  - whether to use a duplicate cast for processing the final prosthesis
  - how the occlusal load should be distributed in the final prosthesis
  - whether there is a need for spacers and the nature of these
- 2 place the agreed wax trial prosthesis onto the cast and accurately transfer the information on tooth position from the try-in onto the cast
- 3 select and prepare mould material which is appropriate to:
  - the complexity of the prosthesis
  - the preferences of the client
- 4 construct a mould of the appropriate size and shape for converting the wax trial prosthesis to polymeric material
- 5 eliminate wax from the mould and prepare the surfaces of the mould and the artificial teeth for the introduction of polymeric
- 6 add spacers to create the correct size of void for a soft lining or resilient lining reservoir chamber if this has been prescribed
- 7 select polymeric material to manufacture the trial prosthesis and any resilient liner of a type and colour which is compatible with:
  - the other materials in the prosthesis
  - the strength of the finished prosthesis
  - the aesthetic requirements of the finished prosthesis
- 8 prepare in the correct ratio the required quantity of polymeric material and introduce it into the mould in a way that is consistent with how the material will be processed
- 9 determine the need for and perform a trial closure when using conventional packing, making additional modifications to form the resilient lining until the final required prosthesis is produced
- 10 process the polymeric material for the correct length of time at the correct temperature
- 11 release the processed removable prosthesis from the mould without causing damage and trim any excess material.

**Element**

**EDT06.3 Trim, polish, finish and evaluate complete removable prostheses**

**Performance criteria**

**The worker will need to:**

- 1 select methods, materials and equipment for trimming, finishing and polishing the final prosthesis that are appropriate to the type of prosthesis and the materials used to make it
- 2 fix casts on articulating plaster and reposition them on an articulator
- 3 assess the articulated prosthesis, confirm that the occlusion is appropriate to the prescription and the patient's natural dentition and make any necessary adjustments to maintain the original vertical dimension of the occlusion
- 4 trim the prosthesis to the required dimension to remove any processing irregularities or sharp edges consistent with:
  - relevant anatomical features
  - the required extension of the base
- 5 polish the prosthesis to create smooth and polished non-fitting surfaces and rolled borders
- 6 evaluate the finished prosthesis for:
  - its quality and freedom from defects<sup>2</sup>
  - functional effectiveness to the design
  - fit to the cast
  - compliance with the prescription
- 7 correctly identify the finished prosthesis with the patient's unique reference and date of production
- 8 effectively clean and disinfect the finished prosthesis, prepare and package it safely for despatch together with instructions for the patient and client
- 9 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the prosthesis and store the records in the correct location consistent with relevant legislation.

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<sup>2</sup> The defects might be in relation to: articulation, surface, colour, function or polymerisation

**UNIT**

**EDT07 Design and manufacture partial removable prostheses**

**Information about this unit**

This unit focuses on the design and manufacture of partial removable prostheses – both simple and complex; dental devices which are custom-made to fit the patient's unique mouth shape and which replace one or more missing teeth.

Partial removable prostheses may be made completely from polymeric materials, from polymeric with some metallic components (such as locking mechanisms for retention in the mouth) or from a metallic alloy framework on which the artificial teeth are embedded into acrylic held in place on the framework. A partial prosthesis should restore a natural appearance in colour, shape and size; fit the patient's mouth comfortably, be retained in place in the patient's mouth and should not attract a build-up of food debris. In order to manufacture a prosthesis which meets these aesthetic and functional requirements, the worker needs to have an accurate cast, an accurate record of the relationship between the patient's upper and lower jaw and a record of the patient's tooth shade.

There are three elements

EDT07.1 Design, manufacture and modify trial partial removable prostheses

EDT07.2 Manufacture partial removable prostheses

EDT07.3 Trim, polish, finish and evaluate partial removable prostheses

## Scope of the standards

- 1 Partial removable prostheses:
  - a) all polymeric partial removable prosthesis
  - b) polymeric partial prosthesis incorporating metallic components
  - c) polymeric partial prosthesis incorporating metallic frameworks.
  
- 2 Articulators:
  - a) adjustable
  - c) fixed condylar path.
  
- 3 Artificial teeth:
  - a) polymeric
  - b) ceramic
  - c) metallic.
  
- 4 Components
  - a) frameworks
  - b) retentive components (including clasps, magnets)
  - c) abutments
  - d) spacers
  - e) precision attachments
  - f) semi-precision attachments
  - g) inlays, onlays and overlays
  - h) implant supported precision attachments.
  
- 5 Material to manufacture the trial prosthesis:
  - a) heat cure polymeric
  - b) self cure polymeric
  - c) light cure polymeric
  - d) thermo formed.
  
- 6 Introduce polymeric material in to the mould by:
  - a) pouring
  - b) injection
  - c) conventional packing.

**Element**

**EDT07.1 Design, manufacture and modify trial partial removable prostheses**

**Performance criteria**

**The worker will need to:**

- 1 effectively clean and disinfect the returned occlusal registration rim and baseplate and transfer registration information accurately to the cast
- 2 mount the cast on an appropriate articulator, articulate it correctly and consistent with available occlusal registration information and record the necessary information correctly
- 3 examine the prescription and cast and select teeth of the appropriate:
  - shade
  - shape
  - size
  - type
  - cuspal forms of natural dentitionand make any adjustments which are required to match the patient's natural dentition
- 4 modify, position and attach the prescribed artificial teeth to the baseplate in a manner that produces:
  - occlusion and articulation appropriate to the patient's recorded jaw relationship
  - the required aesthetic appearance
  - a prosthesis which maximises retention, stability and support
  - maximum masticatory efficiency
- 5 shape and contour the supportive wax consistent with:
  - the patient's musculature
  - the lost tissues
  - the addition of any additional retentive components
- 6 confirm that the trial removable prosthesis conforms to the prescription and planned design
- 7 clearly and accurately identify trial removable prosthesis with the patient's unique reference and date of production
- 8 effectively clean and disinfect the trial removable prosthesis, prepare and package it safely for despatch and return it to the client at the agreed time
- 9 effectively clean and disinfect the returned trial removable prosthesis and identify from the client's instructions any modifications which are required
- 10 check the returned trial prosthesis for loosening or movement of teeth which may have occurred during try-in and make any adjustments which are necessary
- 11 fit the returned trial prosthesis to the cast if it needs to be modified, articulate them if this is required and make the required modifications

- 12 repeat the processes of modifying the prosthesis and returning it to the client for a try-in until a satisfactory prosthesis is achieved.

## Element

### EDT07.2 Manufacture partial removable prostheses

#### Performance criteria

##### The worker will need to:

- 1 evaluate the prescription, the casts, the design and the modified trial prosthesis and decide:
  - which cast to use for processing the final prosthesis
  - how the occlusal load should be distributed in the final prosthesis
  - the degree of resilience required of components within the final prosthesis
  - the need for spacers and whether pre-formed or custom-made spacers are appropriate
  
- 2 identify the components that are required and place them on the selected cast in a position that is correct for:
  - the design
  - the path of insertion of the prosthesis
  
- 3 place the agreed wax trial prosthesis onto the cast and accurately transfer the information on tooth position and components from the try-in onto the cast
  
- 4 re wax, shape and contour the supportive wax consistent with:
  - the patient's musculature
  - the lost tissues
  - the addition of any additional retentive componentsand seal the trial prosthesis to cast
  
- 5 select and prepare mould material that is appropriate to:
  - the complexity of the prosthesis
  - the preferences of the client
  - cost
  
- 6 construct a mould of the appropriate size and shape for converting the wax trial prosthesis to polymeric material
  
- 7 eliminate wax from the mould and prepare the surfaces of the mould and the artificial teeth for the introduction of polymeric
  
- 8 add any required spacers to create the correct size of void for soft lining if this has been prescribed and block out components when this is necessary
  
- 9 select material to manufacture the trial prosthesis of a type and colour which is compatible with:
  - the other materials in the prosthesis
  - the strength of the finished prosthesis
  - the aesthetic requirements of the finished prosthesis
  
- 10 prepare in the correct ratio the required quantity of polymeric material and introduce it into the mould in a way that is consistent with how the material will be processed

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- 11 determine the need for and perform a trial closure when using conventional packing, making additional modifications to form the resilient lining until the final required prosthesis is produced
- 12 process the polymeric material for the correct length of time at the correct temperature
- 13 release the processed removable prosthesis from the mould without causing it damage and trim any excess material.

**Element**

**EDT07.3 Trim, polish, finish and evaluate partial removable prostheses**

**Performance criteria**

**The worker will need to:**

- 1 select methods, materials and equipment for trimming, finishing and polishing the final prosthesis that are appropriate to the type of prosthesis and the materials used to make it
- 2 fix casts on articulating plaster and reposition them on an articulator
- 3 assess the articulated prosthesis, confirm that the occlusion is appropriate to the prescription and the patient's natural dentition and make any necessary adjustments to maintain the original vertical dimension of the occlusion
- 4 trim the prosthesis to the required dimension consistent with:
  - relevant anatomical features
  - the required extension of the base
- 5 polish the prosthesis to create smooth and polished non-fitting surfaces and rolled borders
- 6 evaluate the finished prosthesis for:
  - its quality and freedom from defects<sup>3</sup>
  - functional effectiveness to the design
  - fit to the cast
  - compliance with the prescription
- 7 correctly identify the finished prosthesis with the patient's unique reference and date of production
- 8 effectively clean and disinfect the finished prosthesis, prepare and package it safely for despatch together with instructions for the patient and client
- 10 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the prosthesis and store the records in the correct location consistent with relevant legislation.

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<sup>3</sup> The defects might be in relation to: articulation, surface, colour, function or polymerisation.

## UNIT

### **EDT08 Design and manufacture cast and wrought metallic components and cast frameworks for removable prostheses**

#### **Information about this unit**

This unit focuses on the design and manufacture of wrought and simple cast frameworks, and metallic components for removable prostheses. The worker needs to manufacture wrought components; design and manufacture burn-out patterns for simple cast metal frameworks; and deinvest, trim, finish and evaluate alloy structures.

There are three elements

EDT08.1 Manufacture wrought components for removable prostheses

EDT08.2 Design and manufacture burn-out patterns for cast metal frameworks

EDT08.3 Deinvest, trim, finish and evaluate metallic structures for removable prostheses.

#### **Scope of this standard**

- 1 Components:
  - a) reciprocation
  - b) bracing
  - c) retention
  - d) occlusal support.
  
- 2 Alloys:
  - a) precious alloys
  - b) non-precious alloys.
  
- 3 Casting alloys by:
  - a) centrifugal force
  - b) gravity
  - c) vacuum.
  
- 4 Metallic structures for:
  - a) complete removable prosthesis
  - b) partial removable prosthesis
  - c) occlusal prosthesis.

## Element

### EDT08.1 Manufacture wrought components for removable prostheses

#### Performance criteria

##### The worker will need to:

- 1 analyse the cast and identify:
  - the occlusion and edentulous areas
  - the components that will be required to achieve the required function
  - the optimum position and form of components
  
- 2 design a prosthesis that:
  - has the potential to achieve the required function within the patient's mouth
  - incorporates sufficient retention and support
  - achieves the best possible balance between function, aesthetics and cost
  
- 3 contact the client without delay if it is not feasible to produce the metallic components and propose alternative options for the design of the components and the prosthesis
  
- 4 evaluate whether the cast needs to be modified to design and manufacture the required components
  
- 5 evaluate the cast and design and decide on the basis of cost, time and function:
  - where pre-formed components can be used within the prosthesis
  - which components will need to be custom-made
  - any necessary adjustments to component design
  
- 6 identify and select any pre-formed components which are required, make any modifications to them that are necessary to ensure that they will perform the correct function, and confirm that they are fit for purpose
  
- 7 select wire of the correct gauge and material for the custom-made components which are required, cut it accurately to the required length and straighten it in a manner which avoids unwanted material stress
  
- 8 form custom-made components to the required design and size using the methods recommended by the wire's manufacturer and in a manner that minimises the risks of over-work of the material
  
- 9 repeatedly check components during manufacture to confirm that:
  - they fit to the cast
  - they provide the correct extensions against the working cast
  - they will not damage surrounding tissues in the mouth
  - the developing components comply with the prescription and design
 and make any adjustments which are required
  
- 10 accurately position the components of the prosthesis in the specified location on the cast and confirm:
  - that those which apply retention accurately engage appropriate undercuts and provide occlusal support
  - that those which apply reciprocal action effectively complement the retentive components
  - their fit

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- their security
- their compliance with the functional and aesthetic requirements of the prescription.

**Element**

**EDT08.2 Design and manufacture burn-out patterns for cast metal frameworks**

**Performance criteria**

**The worker will need to**

- 1 prepare the master cast and duplicate it using materials and processes that produce an accurate copy of the cast
- 2 prepare appropriate moulds for refractory casts and pour appropriate vacuum-mixed refractory material to completely fill the mould, leave it to set for the necessary period of time and then remove from the mould
- 3 prepare the refractory casts appropriately for the next stage in the process and apply an appropriate hardener or sealant
- 4 transfer the design outline correctly to the refractory cast
- 5 select appropriate wax and pre-formed components
- 6 adapt a pattern and wax it up to the refractory cast consistent with the design
- 7 sprue the pattern using material of the correct size and in the correct shape and position for the material being cast, and attach it to the investment former
- 8 treat the surface of the pattern appropriately and invest in refractory material according to manufacturers' instructions to produce a reference mould
- 9 leave the refractory mould for the appropriate setting time, remove the mould former if this is necessary then place it in the furnace and programme an appropriate burn-out and heat cycle
- 10 remove the mould once the heat cycle has finished and place in the casting machine
- 11 select and melt the alloy, and cast it using appropriate material and equipment.

**Element**

**EDT08.3 Devest, trim, finish and evaluate *metallic structures* for removable prostheses**

**Performance criteria**

**The worker will need to:**

- 1 select appropriate methods, materials and equipment for devesting, trimming and polishing the metal alloy structure
- 2 remove the cast alloy structure from the investment after appropriate cooling treatment:
  - without causing damage to the integrity of the structure
  - minimising risks to health and safety
- 3 remove oxides using an appropriate abrasive or chemical treatment
- 4 visually examine the cast alloy structure, correctly identify any casting faults<sup>4</sup> and assess the viability of casting
- 5 remove sprues and trim the alloy structure so that:
  - it has no sharp edges and irregularities
  - clasps have appropriate form and dimension
  - junctions with soft tissue are appropriately formed
  - finishing lines are clearly defined
  - all components are the correct size and shape
- 6 evaluate the pre-formed components for their function and take the appropriate remedial action in relation to any that are unacceptable
- 7 brighten the surface of the alloy using appropriate materials and equipment
- 8 remove any processing anomalies that exist
- 9 evaluate the finished alloy structure and confirm that it:
  - is effective
  - fits the cast
  - is free of defects
  - meets the requirements of the planned design
  - complies with the prescription
  - is fit for purpose
- 10 finish the alloy structure using appropriate abrasives and polishes and check it for:
  - polish
  - accuracy
  - strength
  - integrity

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<sup>4</sup> Casting faults would include porosity and impurities.

- 11 effectively clean and disinfect the finished alloy structure
- 12 correctly identify the finished alloy structure with the patient's unique reference<sup>5</sup> and date of production
- 13 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the finished alloy structure and store the records in the correct location consistent with relevant legislation.

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<sup>5</sup> Identifying the alloy structure with the patient's unique reference may be by placing it within sealed packaging clearly marked with the patient's details.

## UNIT

### EDT09 Reline, rebase, repair and modify removable prostheses

#### Information about this unit

##### Summary

This unit focuses on the relining, rebasing, repair and modification of removable prostheses. The worker needs to prepare the working environment, reline and rebase a removable prosthesis when it no longer fits. Relining and rebasing involves adding further polymeric material to the existing prosthesis to achieve the required fit. This means that the worker needs to identify where and how much additional polymeric is required by creating a cast from an impression taken by the clinician using the existing prosthesis as a tray.

Repairing a broken or damaged prosthesis requires the worker to assemble the remaining parts of the prosthesis, evaluate whether an effective repair is possible, and repair the damaged/broken prosthesis when this is possible. A cast will be needed, which may be poured from the re-assembled remaining pieces of the prosthesis (if all are available) or if there are parts missing, by the clinician re-assembling the pieces, placing them in the patient's mouth and taking an impression (in-situ impression). Modifying an existing prosthesis involves replacing or adding components (eg teeth, clasps), or extending the existing base and flanges. Again, casts will be required which may be formed as for relining and rebasing, or by the clinician fitting the existing prosthesis in the patient's mouth and then taking an impression.

There are five elements

- EDT09.1 Reline and rebase removable prostheses
- EDT09.2 Repair polymeric components of removable prostheses
- EDT09.3 Repair metallic and ceramic components of removable prostheses
- EDT09.4 Modify removable prostheses
- EDT09.5 Trim, polish, finish and evaluate removable prostheses which have been repaired, relined, rebased or modified.

## Scope of this standard

- 1 Removable prostheses for relining and rebasing:
  - a) all-polymeric removable prosthesis
  - b) partial polymeric removable prosthesis incorporating metallic components
  - c) partial polymeric removable prosthesis incorporating metallic frameworks.
  
- 2 Materials for relining and rebasing prostheses:
  - a) heat cure polymeric
  - b) self cure polymeric
  - c) light cure polymeric
  - d) resilient linings.
  
- 3 Position metallic and ceramic components using:
  - a) spot welding
  - b) soldering
  - c) wax.
  
- 4 Modifying removable prostheses by:
  - a) adding new metallic components
  - b) modifying existing metallic components
  - c) adding new artificial teeth
  - d) replacing existing artificial teeth
  - e) modifying the denture base.
  
- 5 Articulators:
  - a) adjustable
  - b) fixed condylar path.

**Element**

**EDT09.1 Re-line and re-base *removable prostheses***

**Performance criteria**

**The worker will need to:**

- 1 correctly prepare cast material in a manner which is appropriate for the process
- 2 effectively clean and disinfect the received impression and pour the cast material correctly into the impression and produce a cast that:
  - provides an accurate positive image of the impression
  - is dense
  - is free from voids or other visible defects
- 3 produce an index that:
  - provides an accurate reciprocal location to hold the teeth in place
  - is in the correct occlusal vertical dimension
- 4 remove the impression in a manner that maintains the integrity of the cast and minimises disturbance to the teeth
- 5 remove an appropriate thickness of material from the fitting surface of the prosthesis and shape the prosthesis suitably to produce sufficient bonding for the new material
- 6 select and prepare materials appropriate to the nature and construction of the removable prosthesis and in the correct quantities for re-shaping the prosthesis
- 7 evaluate the occlusal vertical dimension of the cast against the index and make any necessary adjustments
- 8 apply releasing agent to mating surfaces to facilitate effective separation and boil out any traces of wax prior to packing
- 9 mix resin and monomer in the correct manner and quantities to allow the necessary reaction to take place and fill the moulds completely with polymeric material whilst minimising material wastage
- 10 process the polymeric material for the correct length of time at the correct temperature
- 11 release the removable prosthesis from the moulds without damaging it following curing and trim any excess material.

## Element

### EDT09.2 Repair<sup>6</sup> polymeric components of *removable prostheses*

#### Performance criteria

##### The worker will need to:

- 1 effectively clean and disinfect the prosthesis fragments and clearly identify the patient for whom it was made<sup>7</sup>
- 2 handle fragments in a manner which minimises the likelihood of losing or mixing any of them with fragments from other prostheses
- 3 form into the correct relationship those fragments of the removable prosthesis which it is possible to reassemble and fix them together
- 4 assess the reassembled fragments and make a justifiable decision as to whether:
  - to request an impression with the reassembled prosthesis in place
  - a new impression is needed to enable the prosthesis to be repaired
  - the damaged prosthesis is beyond repair
- 5 effectively clean and disinfect the received impression and pour the cast material correctly into the impression and produce a cast that:
  - provides an accurate positive image
  - is dense
  - is free from voids or other visible defects
- 6 separate the cast from the impression and any reassembled fragments of the damaged prosthesis in a manner which minimises damage and prepare the cast appropriately for use
- 7 remove an appropriate thickness of polymeric from the damaged site and shape the prosthesis suitably to produce sufficient bonding for the new material
- 8 apply releasing agent to mating surfaces to facilitate effective separation and boil out any traces of wax prior to packing
- 9 prepare polymeric resin:
  - appropriate to the nature and construction of the removable prosthesis
  - in the correct quantities for repairing the prosthesis
- 10 apply polymeric resin using the correct technique to the required shape and thickness and repeatedly place the prosthesis on the cast and make any adjustments:
  - for fit
  - to minimise any damage to surrounding tissues in the mouth which are obvious from the cast
- 11 apply additional strengthening and linking material appropriately when this is required

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<sup>6</sup> The repair may relate to a damaged baseplate or a fractured tooth.

<sup>7</sup> Identifying the patient may mean marking their identity on each fragment, keeping the fragments together in a marked bag or joining all of the fragments to a strip of wax or tape.

- 12 process the material for the correct length of time at the correct temperature
- 13 release the repaired prosthesis from the moulds without damaging it following processing and trim any excess material.

## Element

### EDT09.3 Repair metallic and ceramic components of removable prostheses

#### Performance criteria

##### The worker will need to:

- 1 effectively clean and disinfect the prosthesis fragments and clearly identify the patient for whom it was made<sup>8</sup>
- 2 handle fragments in a manner which minimises the likelihood of losing any or of mixing them with fragments from other prostheses
- 3 form into the correct relationship those fragments of the removable prosthesis which it is possible to reassemble and fix them together
- 4 promptly contact the client to obtain a new impression of the fitting surface inside the prosthesis when it is not possible to reassemble the fragments
- 5 effectively clean and disinfect the received impression and pour the cast material correctly into the reassembled prosthesis or impression and produce a cast that:
  - provides an accurate positive image
  - is dense
  - is free from voids or other visible defects
- 6 remake any ceramic or metallic components that are not capable of being reused from the damaged prosthesis
- 7 assemble the components on the cast, fix them securely together, remove the assembled prosthesis from the cast and embed it in a suitable investment
- 8 position the components in the correct place and prepare them for joining so that:
  - an optimum join can be made
  - they are appropriate to the joining method to be used
  - any polymeric components which could be damaged during the process are protected
- 9 accurately join components at the correct points to form secure, strong and viable joints
- 10 evaluate each finished join for its
  - location
  - strength
  - integrity
  - function
  - fitness for purposeand discard and remake any which give cause for concern.

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<sup>8</sup> Identifying the patient may mean marking their identity on each fragment, keeping the fragments together in a marked bag or joining all of the fragments to a strip of wax or tape.

**Element**

**EDT09.4 *Modify removable prostheses***

**Performance criteria**

**The worker will need to:**

- 1 effectively clean and disinfect the received impression and check it against the case data and confirm their identity
- 2 appropriately prepare the impression to receive the cast material and select appropriate material for making the cast that meet the technical requirements
- 3 correctly prepare cast material that is appropriate for:
  - the process which will be used to manufacture the final prosthesis
  - the nature of the impression material
- 4 pour the cast material correctly into the impression and produce a cast that:
  - provides an accurate positive image of the impression
  - includes the detail and area that is required to modify the prosthesis
  - is dense
  - is free from voids or other visible defects
- 5 survey the cast to identify the position and size of undercuts, determine an appropriate path of insertion for the planned prosthesis and block out any unsuitable undercuts
- 6 add extra mechanical retention to the prosthesis if this is required and prepare the surfaces appropriately for the modification that is to be made<sup>9</sup>
- 7 select and prepare the components for modifying the prosthesis that are appropriate to:
  - the nature and construction of the removable prosthesis
  - the modification which is required
  - the shade, size, type and cuspal forms of the patient's natural dentition
- 8 select and position in wax any artificial teeth that need to be added to the prosthesis and adjust to the baseplate in a manner that produces:
  - an occlusion appropriate to the prescription and natural dentition
  - the required aesthetic appearance
- 9 shape and contour the supportive wax for additional artificial teeth so that it is consistent with:
  - the patient's musculature
  - the lost tissues
  - the addition of any retentive components
- 10 place additional or replacement metallic components in the correct place on the prosthesis and fix them securely with an appropriate amount of fixing material

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<sup>9</sup> Preparing the surfaces will include removing an appropriate thickness of polymeric and shaping the prosthesis for the addition of new polymeric material.

- 11 select and use appropriate equipment and materials to attach additional or replacement metallic components to the prosthesis at the correct points to form secure, strong and viable joins
  
- 12 select and prepare polymeric materials for reshaping the prosthesis which are:
  - appropriate to the nature and construction of the removable prosthesis
  - in the correct quantitiesand apply them in an appropriate manner to achieve the required shape and thickness
  
- 13 repeatedly place the developing prosthesis on the cast during the modification process and make any necessary adjustments to:
  - confirm its fit
  - minimise any likelihood of damage to surrounding tissues in the patient's mouth which are obvious from the cast.

**Element**

**EDT09.5 Trim, polish, finish and evaluate *removable prostheses* which have been repaired, relined, rebased or modified**

**Performance criteria**

**The worker will need to:**

- 1 trim the prosthesis to the required dimension consistent with:
  - relevant anatomical features
  - the required extension of the base
- 2 examine the fit surface and remove any processing anomalies and sharp surfaces that could cause discomfort to the wearer
- 3 fit the prosthesis to the working cast maintaining the required path of insertion
- 4 polish the prosthesis to create smooth and polished non-fitting surfaces and rolled borders
- 5 fit the trimmed and polished prosthesis to the cast and reposition the casts on an appropriate articulator
- 6 assess the articulated prosthesis, confirm that the occlusion is appropriate to the prescription and the patient's natural dentition, make any necessary adjustments to maintain the original vertical dimension of the occlusion
- 7 evaluate the finished prosthesis for:
  - its quality and freedom from defects
  - functional effectiveness to the design
  - fit to the cast
  - compliance with the prescription
- 8 correctly identify the finished prosthesis with the patient's unique reference and date of production
- 9 effectively clean and disinfect the finished prosthesis, prepare and package it safely for despatch together with instructions for the patient and client
- 10 make complete, accurate and up-to-date records relating to identification components and materials used in the repair and modification of the prosthesis, and store the records in the correct location consistent with relevant legislation.

## UNIT

### EDT10 Design and manufacture obturators

#### Information about this unit

##### Summary

This unit focuses on the design and manufacture of obturators. Obturators are designed to replace the roof of the mouth and related areas, up to and including supporting the orbit of the eye. Obturators may include a set of complete or partial dentures within their design and also be used in the rehabilitation of patients requiring facial prostheses.

Obturators are used to correct congenital problems (such as cleft palates) or for acquired defects (such as when tissue has been removed due to the presence of tumours). Obturators may be permanent as for most congenital problems, semi-permanent or temporary (eg when there is a need to make an obturator rapidly following emergency surgery, or when a patient's existing denture is used as a temporary obturator). Due to the complexity of the patient's needs and of the related work, it is necessary for the technician to work closely with other members of the oral healthcare team.

Obturators may be made completely from polymeric materials, from polymeric with some metallic components (such as locking mechanisms for retention in the mouth) or with a metallic alloy framework (such as in conjunction with dental implants). It is vital that obturators fit the patient exactly as otherwise food and drink will escape through a patient's nose. Obturators should restore a natural appearance in colour, shape and size; fit the patient's mouth comfortably, be retained in place in the patient's mouth, should not attract a build-up of food debris and facilitate speech. In order to manufacture a prosthesis which meets these aesthetic and functional requirements, the worker needs to have an accurate cast, and have, as far as is possible given the nature of the problem, an accurate record of the relationship between the patient's upper and lower jaw.

Due to the nature of the oral health problems that require the development of obturators, dental technologists will tend to work closely with clients, patients and other members of the care team in their development. This requires good communication skills with clients, patients and other members of the care team alike.

There are three elements

- EDT10.1 Design, produce and modify trial obturators
- EDT10.2 Manufacture obturators
- EDT10.3 Trim, polish, finish and evaluate obturators.

## Scope of this standard

- 1 Obturators:
  - a) solid
  - b) clip-on mechanism with existing dentures
  - c) one-piece - hollow box
  - d) sectional.
  
- 2 Obturators made from:
  - a) all polymeric material for a partial removable prosthesis (including those incorporating soft lining materials)
  - b) polymeric material for a partial prosthesis incorporating metallic components<sup>10</sup>
  - c) polymeric material for a partial prosthesis incorporating metallic frameworks
  - d) other emerging materials (eg those that are monomer-free)
  
- 3 Articulators:
  - a) adjustable
  - b) fixed condylar path.
  
- 4 Artificial teeth:
  - a) polymeric
  - b) ceramic
  
- 5 Components
  - a) frameworks
  - b) retentive components (eg clasps and magnets)
  - c) abutments
  - d) spacers
  - e) precision attachments
  - f) semi-precision attachments
  - g) inlays, onlays and overlays.
  
- 6 Material to manufacture the obturator:
  - a) heat cure polymeric
  - b) self cure polymeric
  - c) light cure polymeric
  - d) thermo formed.
  - e) metal
  
- 7 Introduce polymeric material in to the mould by:
  - a) pouring
  - b) injection
  - c) conventional packing.

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<sup>10</sup> Metallic components and metallic frameworks would include retentive mechanisms such as for obturators that are retained on implants.

## Element

### EDT10.1 Design, produce and modify trial obturators

#### Performance criteria

##### The worker will need to:

- 1 discuss and agree with the different members of the care team<sup>11</sup> the patient's healthcare needs and the requirements of the obturator design
- 2 attend and contribute effectively to care planning meetings communicating effectively throughout with other members of the care team
- 3 communicate clearly and appropriately with the patient throughout the process
- 4 offer appropriate support to the patient recognising the difficulties they are experiencing
- 5 seek feedback from the patient on the developing design and fit of the obturator and how it can be improved from their point of view
- 6 effectively clean and disinfect the returned occlusal registration rim and baseplate and transfer registration information accurately to the cast
- 7 mount the cast on an appropriate articulator, articulate it correctly and consistent with any available occlusal registration information and record the necessary information correctly
- 8 examine the prescription and cast and select material for replacing soft tissues and teeth that are of the appropriate:
  - shade
  - shape
  - size
  - type
  - cuspal forms of natural dentition
- 9 make any required adjustments to match the patient's remaining oral cavity and natural dentition
- 10 shape and contour the wax that will form the basis of the soft tissue consistent with:
  - the patient's musculature
  - lost tissues
  - the addition of any additional retentive components
- 11 position and attach any prescribed artificial teeth in a manner that:
  - produces occlusion and articulation appropriate to the patient's recorded jaw relationship
  - produces the required aesthetic appearance
  - produces an obturator that maximises retention, stability and support and that eliminates leakage
  - maximises masticatory efficiency
  - facilitates phonetics and speech

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<sup>11</sup> Members of the care team will include, for example, the lead clinician (who is the client), other medical/dental clinicians, a speech therapist, nursing staff etc.

- 12 confirm that the trial obturator conforms to the prescription and planned design and is comfortable for the patient
- 13 clearly and accurately identify trial obturators with the patient's unique reference and date of production
- 14 effectively clean and disinfect the trial obturator and return it safely to the client at the agreed time
- 15 effectively clean and disinfect returned trial obturators and identify from the client's instructions any modifications that are required
- 16 check returned obturators for problems with soft tissue replacement or teeth and make any adjustments that are necessary<sup>12</sup>
- 17 fit the returned obturator to the cast if it needs to be modified, articulate it if this is required and make the necessary modifications
- 18 repeat the processes of modifying the obturator and returning it to the client for a try-in until a satisfactory obturator is achieved.

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<sup>12</sup> Returned obturators include: trial obturators and hard polymeric obturators that have been returned for relining.

**Element**

**EDT10.2 Manufacture *obturators***

**Performance criteria**

**The worker will need to:**

- 1 evaluate the prescription, the casts, the design and the modified trial obturator and decide:
  - which cast to use for processing the final obturator
  - the nature and shaping of the replacement soft tissues
  - how the occlusal load should be distributed in the final obturator
  - the degree of resilience required of components within the final obturator
  - the need for spacers and whether pre-formed or custom-made spacers are appropriate
  - the flasking technique to be used
  
- 2 identify the components that are required and place them on the selected cast in a position that is correct for:
  - the design
  - the path of insertion of the obturator
  
- 3 place the agreed wax trial obturator onto the cast and accurately transfer the information on soft tissue replacement and tooth position and components from the try-in onto the cast
  
- 4 re wax, shape and contour the supportive wax consistent with:
  - the patient's musculature
  - the lost tissues
  - the addition of any additional retentive components
 and seal the trial obturator to the cast
  
- 5 select and prepare mould material that is appropriate to:
  - the complexity of the obturator
  - the preferences of the client and of the patient
  - cost
  
- 6 construct a mould of the appropriate size and shape for converting the wax trial obturator to polymeric material
  
- 7 eliminate wax from the mould and prepare the surfaces of the mould and the artificial teeth for the introduction of polymeric materials
  
- 8 add any required spacers to create the correct size of void for soft lining if this has been prescribed and block out components when this is necessary
  
- 9 select material to manufacture the trial obturator of a type and colour which is compatible with:
  - the other materials in the obturator
  - the strength of the finished obturator
  - the aesthetic requirements of the finished obturator
  
- 10 prepare in the correct ratio the required quantity of polymeric material and introduce it into the mould in a way that is consistent with how the material will be processed

- 11 determine the need for and perform a trial closure when using conventional packing, making additional modifications to form the resilient lining until the final required obturator is produced
- 12 process the polymeric material for the correct length of time at the correct temperature
- 13 release the processed obturator from the mould without causing damage to it and trim any excess material.

## Element

### EDT10.3 Trim, polish, finish and evaluate obturators

#### Performance criteria

##### The worker will need to:

- 1 select methods, materials and equipment for trimming, finishing and polishing the final obturator that are appropriate to its type and the materials used to make it
- 2 fix casts on articulating plaster and reposition them on an articulator
- 3 assess the articulated obturator, confirm that the shape of the soft tissues and the occlusion are appropriate to the prescription and the patient's remaining tissues and dentition and make any necessary adjustments
- 4 trim the obturator to the required shape and dimension consistent with:
  - relevant anatomical features
  - the required extension of the base
- 5 remove spacer medium when hollow-box obturators are being made and completely seal the hollow-box
- 6 polish the obturator to create smooth and polished non-fitting surfaces and rolled borders
- 7 evaluate the finished obturator for:
  - its quality and freedom from defects<sup>13</sup>
  - functional effectiveness to the design
  - fit to the cast
  - leakage if it is a hollow-box obturator
  - compliance with the prescription
- 8 correctly identify the finished obturator with the patient's unique reference and date of production
- 9 effectively clean and disinfect the finished obturator, prepare and package it safely for despatch together with instructions for the patient and client
- 10 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the obturator and store the records in the correct location consistent with relevant legislation.

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<sup>13</sup> The defects might be in relation to: articulation, surface, colour, function or polymerisation.

## UNIT

### EDT11 Design and manufacture implant-based prostheses

#### Information about this unit

##### Summary

This unit focuses on the design and manufacture of implant-based prostheses; dental devices which are custom-made to fit the patient's unique mouth shape and which replace one or more missing teeth. It is vital that the dental technician works as part of the team in the diagnostic and treatment planning phases as well as in the design and manufacture of the prosthesis itself. Due to the time over which implants need to settle in a patient's mouth prior to the final prostheses being fixed, provisional prostheses are often provided.

Once the initial treatment planning and diagnostic process has taken place, the actual design and manufacture of an implant-based prosthesis might be covered by one of the other units ie ?? for simple complete removable prostheses; ?? for single removable tooth coloured restorations.

There are three elements

- EDT11.1 Contribute to the treatment planning and diagnostic process for implant-based prostheses
- EDT11.2 Prepare trays and casts for implant-based prostheses
- EDT11.3 Manufacture fixed implant-based prostheses.

### Scope of this standard

- 1 Implant-based prostheses
  - a) single tooth
  - b) removable partial
  - c) fixed partial
  - d) multiple partials – supported and retained
  - e) complete – supported and retained
  - f) custom abutments
  - g) metal ceramic fixed bridges.
  
- 2 Diagnostic investigations and reports
  - a) CT scans
  - b) bone mapping
  - c) radiographs
  - d) radiographic stents.
  
- 3 Custom-made trays:
  - a) conventional
  - b) chimney
  - c) window.
  
- 4 Implant structure replicas:
  - a) fixture headed
  - b) abutment headed
  - c) hybrid headed.
  
- 5 Articulators:
  - a) adjustable
  - b) fixed condylar path.
  
- 6 Types of occlusal philosophy
  - a) cusp to fossa
  - b) cusp to marginal ridges
  - c) group function
  - d) canine guidance
  
- 7 Manufacturing the implant superstructure might be through:
  - a) casting
  - b) milling
  - c) soldering
  - d) welding.
  
- 8 Polymeric material:
  - a) heat cure
  - b) self cure
  - c) light cure
  
- 9 Introduce polymeric material by:

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- a) pouring
- b) injection
- c) conventional packing.

**Element**

**EDT11.1 Contribute to the treatment planning and diagnostic process for implant-based prostheses**

**Performance criteria**

**The worker will need to:**

- 1 agree with clients the worker's role in contributing to treatment planning and the diagnostic process<sup>14</sup>
- 2 discuss with clients:
  - the patient's expectations of the implant
  - aims and objectives of the treatment
  - the number of appointments that the patient is likely to require and the likely schedule of the appointments and related laboratory work
  - the approximate cost of the laboratory work
- 3 effectively undertake appropriate diagnostic investigations and reports
- 4 discuss with clients:
  - the functional and aesthetic criteria for successful treatment outcomes<sup>15</sup>
  - technical and clinical restrictions
  - any transitional clinical and technical procedures
- 5 produce surgical stents to guide the placing of the implants following discussion with the client

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<sup>14</sup> This might include agreeing who is responsible for ordering and paying for the different components due to the complexity of costing and supply of the different components.

<sup>15</sup> Functional and aesthetic criteria might include, for example, alveolar reduction, periodontal requirements etc.

**Element**

**EDT11.2 Prepare trays and casts for implant-based prostheses**

**Performance criteria**

**The worker will need to:**

- 1 effectively clean and disinfect new primary impressions from the client
- 2 pour appropriate materials to form an accurate cast of the primary impression
- 3 confirm with the client whether the treatment is to proceed as planned or if modifications are needed to the initial treatment plan
- 4 construct a custom-made tray in a design that is appropriate to the impression coping
- 5 disinfect the custom-made tray and return it to the client for the development of a working impression
- 6 disinfect the working impression on receipt from the client
- 7 locate the implant structure replicas accurately in the impression
- 8 confirm the accuracy of the working impression and determine the type of cast that needs to be poured
- 9 produce the correct type of cast using an appropriate technique and appropriate materials.

**Element**

**EDT11.3 Manufacture<sup>16</sup> fixed implant-based prostheses**

**Performance criteria**

**The worker will need to:**

- 1 effectively clean and disinfect the returned occlusal registration rim and baseplate and transfer registration information accurately to the cast
- 2 mount the cast on an appropriate articulator, articulate it correctly and consistently with any available occlusal registration information and record the necessary information correctly
- 3 transfer registration information accurately to the cast.
- 4 modify, position and attach the prescribed artificial teeth to the baseplate in a manner that produces:
  - occlusion and articulation appropriate to the patient's recorded jaw relationship
  - the required aesthetic appearance
  - a prosthesis which maximises retention, stability and support
  - maximum masticatory efficiency
- 5 shape and contour the supportive wax consistent with the patient's musculature to produce trial prosthesis
- 6 clearly and accurately identify trial removable prosthesis with the patient's unique reference and date of production
- 7 effectively clean and disinfect the trial removable prosthesis, prepare and package it safely for despatch and return it to the client at the agreed time
- 8 on receipt of the returned trial removable prosthesis from the client, disinfect, identify any required modifications and gingival remodelling
- 9 design the implant superstructure through:
  - indexing tooth position (matrix)
  - any requirements for gingival remodelling
 and position the appropriate pre-manufactured components
- 10 appropriately manufacture the implant superstructure
- 11 assess the fit of the implant superstructure and confirm that it meets the client's requirements
- 12 send the metallic superstructure to the client for trying in the patient's mouth
- 13 determine the appropriate course of action on receipt of further information from the client
- 14 correctly replace the appropriate artificial teeth on the superstructure using matrices
- 15 return the superstructure with attached artificial teeth to the client for the next stage of try-in

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<sup>16</sup> The manufacture of the implant superstructure might be through the use of CAD-CAM or by hand.

- 16 on receipt of the prostheses from the client, convert the wax to polymeric materials using an appropriate flasking technique developed specifically for the individual case<sup>17</sup>
- 17 appropriately polymerise the materials and deflask
- 18 appropriately trim and polish the prosthesis to create smooth and polished non-fitting surfaces and rolled borders
- 19 evaluate the finished prosthesis for:
  - its quality and freedom from defects
  - functional effectiveness to the design
  - fit to the cast
  - compliance with the prescription
- 20 correctly identify the finished prosthesis with the patient's unique reference and date of production
- 21 effectively clean and disinfect the finished prosthesis, prepare and package it safely for despatch together with instructions for the patient and client
- 22 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the prosthesis and store the records in the correct location consistent with relevant legislation.

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<sup>17</sup> The flasking technique will need to be developed specifically for the individual case dependent on its complexity and the materials concerned. It might involve the use of 2 part or 3 part moulds, sand blasting and other forms of processing.

## UNIT

### EDT12 Design and manufacture prostheses using precision attachments

#### Information about this unit

##### Summary

This unit focuses on the design and manufacture of prostheses using precision attachments; dental devices which are custom-made to fit the patient's unique mouth shape and which replace one or more missing teeth and incorporate the use of a precision connector of two or more parts. One part of the attachment is connected to a root, tooth or an implant, the other part to an artificial prosthesis; this provides mechanical retention. Precision attachments can be used in place of clasp arms: to retain partial dentures with extra or intra-coronal attachments. In complete dentures they can be used on roots or implants carrying studs or bars.

A partial or complete prosthesis using precision attachments should restore a natural dental appearance in colour, shape and size; fit and occlude in the patient's mouth comfortably, be retained firmly in place in the patient's mouth and should not attract a build-up of food debris. In order to manufacture a prosthesis which meets aesthetic, fit, occlusal and functional requirements, the technician needs to have an accurate cast, an accurate record of the relationship between the patient's upper and lower jaw and a record of the patient's tooth shade. The production of custom-made trays, casts, baseplates and occlusal registration rims is not included in this unit but can be found in unit DT03.

There are three elements

EDT12.1 Contribute to the planning process for prostheses using precision attachments

EDT12.2 Design and manufacture prostheses using precision attachments

EDT12.3 Assure the quality of prostheses using precision attachments.

### Scope of this standard

- 1 Prostheses using precision attachments
  - a) intracoronal
  - b) extracoronal
  - c) stud/radicular
  - d) bar.
  
- 2 Patterns:
  - a) wax
  - b) polymeric material
  - c) pre-formed polymeric material.
  
- 3 Converting through:
  - a) gypsum based investing
  - b) phosphate based investing
  - c) adapting matrix sheets
  - d) electro-forming.
  
- 4 Alloy
  - a) precious
  - b) non-precious.
  
- 5 Articulators:
  - a) adjustable
  - b) fixed condylar path.
  
- 6 Artificial teeth:
  - a) polymeric
  - b) ceramic
  - c) metallic.

## Element

### EDT12.1 **Contribute to the planning process for *prostheses using precision attachments***

#### Performance criteria

#### The worker will need to:

- 1 agree with clients:
  - the worker's role in the planning process
  - the way in which the diagnosis and planning is to be carried out
  - who is responsible for ordering and paying for the different components
  
- 2 find out from clients:
  - the reason why precision attachments are being considered
  - how the patient expects the final prosthesis to look and function
  - any concerns that the client has about the health of surrounding teeth and the overall suitability of the prosthesis for the patient
  
- 3 obtain from the patient's clinical notes and related assessments<sup>18</sup>:
  - the type of prosthesis that the patient wants
  - the patient's oral hygiene and potential future tooth loss that should be included in the design
  - any mobility of the patient's teeth
  - whether the patient has any disabilities that might affect their ability to manage certain types of prostheses<sup>19</sup>
  
- 4 produce a master cast/die from the impressions received from the client
  
- 5 appraise the casts/dies for:
  - dentition
  - vertical dimension
  - spaces to be filled
  - clearance for attachments
 and determine the type of attachment to use for the patient concerned
  
- 6 provide advice to the client on an optimal design for the prosthesis including the following aspects:
  - oral hygiene
  - number of abutments
  - angle and height of abutments
  - length of free-end saddles
  - vertical height
  - ridge structure
  - possible physical disability
  - whether the attachment should be rigid or resilient
  
- 7 respond appropriately to questions and issues from the client relating to the design of the prosthesis and the treatment as it proceeds

<sup>18</sup> Related assessments would include, for example, available radiographs and casts.

<sup>19</sup> Disabilities of the patient that would affect their ability to manage certain types of prostheses would include, for example, severe arthritis in the hands.

**Element**

**EDT12.2 Design and manufacture prostheses using precision attachments**

**Performance criteria**

**The worker will need to:**

- 1 evaluate casts and dies against abutment requirements, eliminate any unnecessary undercuts and record and inform the client of any adjustments made
- 2 assess the occlusion using casts mounted on an articulator to:
  - determine the necessary information for the manufacture of occlusal form
  - determine if adequate clearance has been provided
- 3 survey the cast to:
  - establish the alignment of the long axes of the teeth
  - establish undercut and non-undercut areas of the teeth
  - find a path of insertion common to all abutment teeth
- 4 introduce attachments to produce a split design prosthesis in the event of a malalignment of teeth
- 5 introduce attachments into the design that are appropriate for the space to be filled and ensuring that there is sufficient space for wax contouring and oral hygiene
- 6 position matrices/patrics with a parallelometer prior to waxing into position or if using anchors and bars accurately measure and position bars in the wax cradles and test for fit
- 7 convert the pattern using a process appropriate to the alloy and the item
- 8 deinvest the metallic substructure in a manner that maintains the integrity of the metal, place the parts on the cast and dies, check for fit and occlusal contact and make any adjustments that are required

If any of the parts require soldering

- 9 assemble the metallic parts and confirm that components and frameworks are fixed:
  - securely
  - in the required position
  - using an appropriate material
  - in a manner that enables the optimum join to be made
- 10 accurately apply flux to those areas where solder is required and block out with anti-flux those where solder is not required so that there is no incursion of solder in investing, casting and trimming
- 11 heat components to be soldered to a temperature that:
  - is sufficient to melt and control the flow of the solder
  - is sufficient to form a bond
  - prevents damage to the metallurgical properties of the component
- 12 select solder of a type appropriate to the alloy, and apply and control the solder to:
  - give an even flow
  - achieve the thickness and coverage required by the prescription

- 13 remove flux, anti-flux and excess solder once soldering is complete
- 14 place the substructure on the cast after soldering and confirm that:
  - it fits the cast
  - it complies with the prescription
  - it will not damage surrounding tissues in the patient's mouthand make any necessary adjustments

Once the framework is complete

- 15 disassemble and assemble the precision attachments with care ensuring that the parts are kept clearly separated and safe
- 16 compare the developing item throughout the process for its harmonisation with
  - the patient's natural tooth form
  - tooth morphology
  - all occlusal excursive movements
  - effects of adjacent natural teeth and of restorations
  - pontic coronal form
  - profile of pontic in relation to aesthetics, self cleaning and residual ridge
  - aesthetic requirements
  - prescription requirementsand make any necessary adjustments.

**Element**

**EDT12.3 Assure the quality of prostheses using precision attachments**

**Performance criteria**

**The worker will need to:**

- 1 check the item:
  - for faults
  - general fitand undertake any necessary rework
  
- 2 create appropriate textures on the different surfaces consistent with:
  - the alloy
  - the item's design
  - the requirements of the prescription
  
- 3 finish the item so that it is:
  - capable of maintaining accuracy of fit
  - of the appropriate shape
  
- 4 verify the finished prosthesis:
  - for good overall fit of work to die margins and cast parameters
  - for occlusion and articulation
  - for proximal contact areas
  - for appropriate finish of surfaces
  - against the prescription requirements
  
- 5 correctly identify the prosthesis with the patient's unique reference and date of production
  
- 6 effectively clean and disinfect the finished prosthesis, prepare and package it safely for despatch together with instructions for the patient and client
  
- 7 make complete, accurate and up-to-date records relating to the identification, components and manufacture of the prosthesis and store the records in the correct location consistent with relevant legislation.

**KNOWLEDGE AND UNDERSTANDING FOR STANDARDS EDT05 – EDT12 RELATING TO PROSTHETIC DENTAL DEVICES**

The table below shows the knowledge and understanding that is needed to be able to reach the required standards. The code of the different standards is given in the horizontal axis and items of knowledge and understanding are shown in the vertical column. The proposed relevance of the individual items to the different standards is shown using a 'X' in the relevant cells of the table.

Items of knowledge and understanding	EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
A Anatomy, physiology, pathology and microbiology								
1 the skeletal anatomy and physiology of the head and neck	X	X	X	X	X	X	X	X
2 tooth morphology and the form of the natural anterior and posterior teeth	X	X	X	X	X	X	X	X
3 the aetiology and classifications of malocclusions	X	X	X	X	X	X	X	X
4 the structure, function, and movement of the oro-facial musculature (including the tongue) and temporomandibular joint		X	X	X	X	X	X	X
5 disorders and diseases affecting the oral cavity (eg angular cheilitis and denture stomatitis candidiasis, erosive lichen planus and chronic aphthous ulceration and dry mouth)		X	X	X	X	X	X	X
6 the physiological and pathological changes associated with the ageing process and trauma (eg the changes in enamel, dentine and pulp that occur with age and how these affects tooth shape and colour, the effect of tooth loss on the supportive dental tissue, the processes and effect of ridge resorption)		X	X	X	X	X	X	X
7 the importance of retention of the periodontal ligament and the changes in proprioception due to loss of periodontal ligament			X	X	X	X	X	X
8 infections of the jaws and their treatment						X		
9 the effects of oral disease on prosthesis and appliance design and function						X		
10 oral malignancy and the surgical and medical management of oral malignancy						X		
11 the principles of radiotherapy and chemotherapy and their effects upon device design and function						X		
12 the preoperative device design and manufacture						X		
13 the effect of treatments on materials selection, appliance design and						X		

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Items of knowledge and understanding	EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
function, and manufacturing techniques; radiotherapy treatment appliance manufacture and use								
14 principles of tissue transfer, structure of skin, clinical methods of tissue transfer, design principles of appliances used in tissue transfer						X		
15 surgical reconstruction						X		
16 post treatment anatomy and physiology						X		
17 the broader factors (sociological, behavioural, environmental and economic) that contribute to oral health and illness.	X	X	X	X	X	X	X	X
<b>B Rationale for the provision of removable prostheses</b>								
1 the emotional impact of tooth loss on patients		X	X	X	X		X	
2 the emotional response by the patient and those close to the patient in relation to soft tissue and tooth loss						X		
3 the role of prostheses in the restoration and maintenance of: - tissue support - aesthetics - phonetics - function of occlusion and the temporomandibular joint		X	X	X	X	X	X	
4 the importance of restoring and maintaining the occlusal vertical dimension		X	X	X	X	X		
5 the benefits and restrictions of immediate tooth replacement in the provision of prostheses		X	X	X	X	X		
6 the benefits and restrictions of retaining root structures in the provision of prostheses		X	X	X	X	X	X	
7 the use and need for transitional removable prostheses / implant-based prostheses		X	X	X	X	X	X	
8 the purpose and use of resilient liners and tissue conditioners		X	X	X	X	X		
9 the design limitations of large anterior undercuts and pre-existing dental conditions		X	X	X	X	X		
10 the physical and functional needs of the patient in relation to soft tissue loss in the oral cavity						X		

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
C	Materials – general								
1	the classification and sub-classification of materials on the basis of chemical composition and internal structure	X	X	X	X	X	X	X	X
2	the mechanical, physical, thermal, chemical and biological properties of materials <ul style="list-style-type: none"> <li>- the importance of the evaluation of materials prior to use in the oral cavity</li> <li>- the ideal properties of materials used in the manufacture of prostheses</li> <li>- comparison of the materials currently used in dentistry to the ideal properties</li> <li>- the effects of storage on the properties of the materials used in the manufacture of prostheses</li> <li>- the properties of materials during manipulation</li> <li>- the properties of materials during setting</li> <li>- the effects of processing on the properties of the materials used in the manufacture of prostheses</li> </ul>		X	X	X	X	X	X	X
3	the role and purpose of cast and wrought metal components and cast frameworks; the other materials that will be added to them in the manufacture of prostheses and the principles of bonding between cast and wrought metal components and cast frameworks and the materials which will be added to them				X				
D	Materials – for cast and mould manufacture								
1	gypsum products for cast and mould manufacture <ul style="list-style-type: none"> <li>- the requirements of gypsum products used in the manufacture of casts and moulds for prostheses</li> <li>- the composition of gypsum products used in dentistry</li> <li>- the manipulation and setting characteristics of gypsum products</li> <li>- the properties of the set materials used in the manufacture of casts and moulds</li> </ul>	X	X	X	X	X	X	X	X

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Items of knowledge and understanding	EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
<b>E Materials – waxes</b>								
1 the requirements of wax pattern and base materials	X	X	X	X	X	X	X	X
2 the composition of dental waxes used in the manufacture of prostheses	X	X	X	X	X	X	X	X
3 the properties of dental waxes used in the manufacture of prostheses	X	X	X	X	X	X	X	X
4 the essential differences between baseplate waxes and casting pattern waxes	X	X	X	X	X	X	X	
5 the relevance of the coefficient of thermal expansion (CTE) in the use of waxes	X	X	X		X	X	X	X
6 the importance of maintaining the physical, mechanical and aesthetic properties of waxes	X	X	X	X	X	X	X	X
7 the importance of solid/solid transitions in the manipulation of waxes		X	X	X	X	X	X	X
8 the importance of pattern strain relief in the manufacture of indirect patterns		X	X		X	X	X	X
<b>F Materials – dental polymers</b>								
1 the term polymerisation	X	X	X		X	X	X	
2 the activation mechanisms that can be used in the polymerisation of polymers	X	X	X		X	X	X	
3 the initiation processes that can be used in the polymerisation of polymers	X	X	X		X	X	X	
4 the processes by which termination occurs in dental polymers	X	X	X		X	X	X	
5 the terms step and chain polymerisation and how these may be equated to the terms condensation and addition curing		X	X		X	X	X	
6 the terms thermoplastic and thermoset		X	X		X	X	X	
7 structural features of polymer chains: - the term copolymerisation - the terms branching and cross-linking and how these relate to: • the thermosetting of denture base polymers • the setting of reversible and irreversible hydrocolloid impression materials • the setting of rubber based and silicone impression materials - transition temperatures of polymers (T <sub>m</sub> and T <sub>g</sub> ) and their effects on		X	X		X	X	X	

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
	the physical and mechanical properties of polymers - the term tacticity and the various forms that this may take in the structure of polymers - the rotation of polymer segments - the effect of the degree of polymerisation on properties of polymers								
8	denture base polymers - the specific requirements of denture base polymers - the constituents and properties of denture base polymers, hard relines materials, permanent soft lining materials, tissue conditioners and temporary soft lining materials - the constituents and properties of hard relines materials - the constituents and properties of tissue conditioners and temporary soft lining materials - the constituents and properties of permanent soft lining materials - the microbial, physical and technical implications of the metallo-polymeric junction		X	X		X	X	X	
G	Materials – ceramics								
1	ceramics used in dental technology including for abutments							X	
H	Materials – dental alloys								
1	the structure and properties of metals and the methods of crystallisation in the cooling of metals			X	X	X	X	X	X
2	the benefits of combining metals to produce alloys			X	X	X	X	X	X
3	the types of binary alloys that can form and the relevance of these structures in the use of dental alloys			X	X	X	X	X	X
4	the importance of dislocations in the structure of metals and alloys			X	X	X	X	X	X
5	the construction of thermal equilibrium diagrams from the cooling curves of different binary alloy compositions			X	X	X	X	X	X
6	the important features of thermal equilibrium diagrams for alloys that form solid solutions			X	X	X	X	X	X
7	the important features of thermal equilibrium diagrams for alloys that			X	X	X	X	X	X

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
	exhibit partial solid miscibility								
8	the relevance of the eutectic mixture on the composition of dental alloys and solders			X	X	X	X	X	X
9	the importance of phase precipitation in alloys that exhibit partial solid miscibility on the hardening mechanisms and corrosion resistance			X	X	X	X	X	X
10	the relevance of non equilibrium cooling conditions on the structure of alloys			X	X	X	X	X	X
11	the importance of homogenisation heat treatments on cast alloys			X	X	X	X	X	X
12	the relevance of refining elements on the castability and eventual crystal structure of alloys			X	X	X	X	X	X
13	the importance of cooling cycles on the physical and mechanical properties of dental alloys			X	X	X	X	X	X
14	the importance of primary, secondary and tertiary creep			X	X	X	X	X	X
15	the effects of cold working on dental alloys and its relevance to anisotropic properties			X	X	X	X	X	X
16	the terms stress relief anneal, recrystallisation and grain growth and its relevance to the use of dental alloys			X	X	X	X	X	X
17	the importance of maintaining the crystal structure of wrought dental alloys			X	X	X	X	X	X
18	the important principles in the soldering, brazing and welding processes used in modern dentistry			X	X	X	X	X	X
19	the relevance of electrolytic corrosion in the use of dental alloys			X	X	X	X	X	X
20	the importance of the use of electro-brightening of certain dental alloys			X	X	X	X	X	X
21	the rationale for the selective plating of dental alloys			X	X	X	X	X	X
22	the relationship between chemical bonds and the properties of solid materials								X
23	management of casting pattern selection								X
24	range of casting pattern materials, natural waxes, synthetic waxes, polymeric materials. structure and properties of waxes, effect of manipulative techniques, changes in temperature and resting of waxes on accuracy								X

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
25	methods of sprueing various metals and systems								X
26	methods of surface finishing								X
I	Materials – dental refractory materials								
1	the need for the use of refractory materials				X	X			X
2	the rationale for the selection of refractory materials				X	X			X
3	the use of phosphate bonded and gypsum bonded refractory materials				X	X			X
4	the setting characteristics of the two main types of investment used in dentistry				X	X			X
5	the importance of thermal expansion of investment materials used in casting and soldering processes				X	X			X
6	the role of the allotropes of silica in the expansion process				X	X			X
7	the role of colloidal silica on the setting and thermal characteristics of phosphate bonded refractory materials				X	X			X
8	the important physical and chemical changes that take place during the heating of dental investments				X	X			X
9	the importance of mould temperature on the crystal structure of cast alloys				X	X			X
J	Techniques of soldering used in dental work								
1	materials, post ceramic soldering, pre-ceramic soldering								X
2	associated refractory materials and transfer cast system								X
3	solder metals used in restorative dentistry including precious and non-precious alloys, using blow torch or furnace methods and laser welding								X
K	Materials – artificial tooth materials								
1	the ideal requirements of artificial tooth materials used in the manufacture of prostheses		X	X			X	X	
2	the properties of the artificial tooth materials available for use in the manufacture of prostheses		X	X		X	X	X	
3	the mechanisms of attaching artificial tooth materials to denture bases		X	X		X	X	X	
4	the benefits and restrictions of combining different materials in the manufacture of prostheses		X	X		X	X	X	
L	Materials – impression, duplicating and disinfection materials								

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
1	the constituents and uses of different impression materials (and duplicating materials)	X	X	X		X	X	X	X
2	the nature and type of disinfection materials and solutions and the effect of these on impressions, casts, occlusal registrations, bacteria, viruses and operators.	X							
3	the compatibility of impression materials with disinfection procedures	X	X	X	X	X	X	X	X
4	the term viscoelasticity and its relevance to the handling of certain types of impression materials	X	X	X	X	X	X	X	X
5	the term elastomeric and the essential characteristics of the materials in this category	X	X	X	X	X	X	X	X
M	Resilient materials								
1	the effect of surface topography upon performance						X		
2	long term biological degradation of resilient materials						X		
3	lamination of resilient materials with other dental polymers						X		
4	bonding of resilient materials to dental baseplate materials						X		
5	mechanical retention of removable bungs dental bases						X		
6	silicone chemistry						X		
7	highly plasticised acrylics, constituents, long term performance, plasticiser loss						X		
N	Manufacturing prosthetic dental devices - retention and stability								
1	the effect of skeletal form and ridge relationships upon the function, design and manufacture of prostheses	X	X	X	X	X	X	X	
2	the role of the baseplate in the retention and stability of prostheses	X	X	X	X	X	X	X	
3	the role of the polished surfaces in the retention and stability of prostheses	X	X	X	X	X	X	X	
4	the importance of occlusal rims in establishing tooth position in the manufacture of prostheses	X	X	X	X	X	X	X	
5	the importance of establishing and maintaining the occlusal table on the stability of prostheses	X	X	X	X	X	X	X	
6	the effect of the residual ridge shape and contour on the retention and		X	X	X	X	X	X	

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Items of knowledge and understanding	EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
stability of prostheses								
7 the effect of saliva viscosity on the retention of prostheses		X	X	X	X	X	X	
8 the effect of the oro-facial musculature on the retention and stability of prostheses		X	X	X	X	X	X	
9 the effects of the use of passive and displacive impression techniques on the retention and stability of prostheses		X	X	X	X	X	X	
10 the principles and the clinical criteria for the use of the neutral zone impression technique		X	X	X	X	X	X	
11 the importance of the use of biometric guides during the stages in the manufacture of prostheses		X	X	X	X	X	X	
12 the role of bucco-lingual positioning of artificial posterior teeth in the stability of prostheses		X	X	X	X	X	X	
13 the role of the positioning of artificial anterior teeth on the stability of prostheses		X	X	X	X	X	X	
14 the importance of artificial posterior tooth form and mould on the stability of prostheses		X	X	X	X	X	X	
15 the role of compensating curves in minimising instability of prostheses		X	X	X	X	X	X	
16 the role of precision attachments in retaining and stabilising prostheses		X	X					
17 complex retention methods: the range of methods which can be used, how they operate, how the complexity affects the design of the prosthesis and the manufacturing methods that can be used			X			X		
18 the use of a patient's denture as the foundation of an obturator						X		
0 Manufacturing custom-made dental devices - aesthetics and phonetics								
1 the effect of the ageing process on natural tooth form and colour	X	X	X					
2 the importance of tooth material selection on the maintenance of aesthetics	X	X	X					X
3 the compromises sometimes necessary between aesthetics and function in the provision of custom-made dental devices	X	X	X	X	X	X		X
4 the importance of base material selection on the appearance of custom-made dental devices	X	X	X	X	X	X		X

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
5	the importance of baseplate design in the development of good phonetics	X	X		X	X	X		
6	the relevance of the existing natural dentition in the creation of custom-made dental devices								X
7	the importance of pre-extraction guides in the development of acceptable aesthetics in the manufacture of prostheses		X	X	X	X	X	X	
8	the various methods of determining anterior tooth form for the manufacture of prostheses		X	X	X	X	X		X
9	the role of dentogenic concepts in the selection of artificial teeth for the manufacture of prostheses		X	X			X		
10	the importance of posterior tooth form in the development of acceptable aesthetics for the manufacture of prostheses		X	X	X	X			X
11	aesthetic and phonetic considerations in the anteroposterior positioning of artificial (upper and lower artificial anterior) teeth		X	X			X		
12	the role of anatomical contouring in improving the aesthetics of prostheses		X	X	X	X	X		X
13	the effect of staining on the aesthetics of prostheses		X	X			X		X
14	the challenges presented by overdenture abutments when maintaining acceptable appearance in prostheses manufacture		X	X	X	X	X		X
15	the importance of developing patient confidence in the process of artificial teeth selection		X	X			X		
16	anatomical complications of prostheses manufacture (eg torus palatinus, insufficient inter-occlusal space, bulbous ridges, Class I and Class II modifications, the varying clinical and technical opinions and techniques regarding posterior cross bites)		X	X			X		
17	the effect of racial variation in mucosal coloration on the aesthetic design of the prostheses and materials selection		X	X			X		
P	Manufacturing custom-made dental devices - articulation								
1	the selection of a suitable dental articulator for the type of prosthesis	X	X	X	X	X	X	X	X
2	the benefits and restrictions of the various types of dental articulator	X	X	X	X	X	X	X	X
3	the various methods of transferring clinical information to the dental	X	X	X	X	X	X	X	X

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Items of knowledge and understanding	EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
articulator								
4 the use and need for kinematic relators (facebows, earbows and pantograph tracings etc.)	X	X	X	X	X	X	X	X
5 the importance of hinge axis for the partially dentate mouth or where parnormal function of the temporomandibular joint exists	X	X	X	X	X	X	X	X
6 the purpose of split mounting and re-articulation procedures	X	X	X	X	X	X	X	X
7 the need to make adjustments to the various components parts of dental articulators based on the type and form of the patients existing or intended anterior tooth arrangement and occlusion	X	X	X	X	X	X	X	X
8 the purpose of centric and eccentric wafers when making adjustments to dental articulators		X	X	X	X	X	X	X
9 the indications and contraindications of using eccentric wafers in the development of occlusal stability during the manufacture of removable prostheses		X	X	X	X	X	X	
10 use of custom table							X	
Q Manufacturing removable prostheses – principles of the design of partial removable prosthesis / obturators / precision attachments								
1 the classifications of partially dentate mouths			X	X	X		X	X
2 the classifications of mouths that need obturation						X		
3 the classifications based on the nature of support gained by the prosthesis during the transmission of masticatory forces			X	X	X		X	
4 the principles of cast surveying and its application to prosthesis design and manufacture			X	X	X	X	X	X
5 the need to identify the component parts of the prosthesis			X	X	X	X	X	X
6 the rationale for the selection of materials to fulfil the design requirements of prostheses			X	X	X	X	X	X
7 the principles of direct retention when applied to prostheses design			X	X	X		X	X
8 the need for reciprocation when direct retainers are used			X	X	X		X	
9 the types and efficacy of reciprocation that may be achieved by appropriate design of prostheses			X	X	X	X	X	

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
10	the importance of guide surfaces in the retention and stability of prostheses			X	X	X		X	
11	the need for and principles of indirect retention when applied to prosthesis design			X	X	X		X	
12	specific features of retention in obturator design						X		
13	the use of the altered cast technique in improving the stability of partial removable prostheses			X	X	X	X	X	
14	the factors influencing the design, peripheral outline and basic contours of the base and connectors for prostheses			X	X	X	X	X	
15	the principles of stress broken designs and there limitations			X			X	X	
16	the principles and clinical requirements of onlay design			X			X		
17	the principles of equipoise designs			X			X		
18	the principles of hinged and "swinglock" designs			X			X		
19	methods of providing obturation, the conditions that may require obturation, particular issues of retention; factors influencing the design of prostheses to provide minor obturation and how to take these into account in the design			X				X	
20	the principles of implantology						X		
21	implantology and osseo-integration						X		
22	the factors affecting posterior tooth selection						X		
23	the different anatomical structures which are used in implant-based prostheses							X	
24	the use of implants for single tooth replacements							X	
25	the use of implants for anchorage in orthodontic tooth movement							X	
26	the relationship of materials selection to the functional requirements of bridges and crowns depending upon span and location								X
27	the design of structures and substructures to meet clinical and functional requirements, and materials properties								X
R	Methods of constructing dental bridges and crowns based on precision attachment work								

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
1	the selection and management of materials and processes to meet client requirements and functional requirements								X
2	principles of bridge and crown design including abutment and retainer selection								X
3	occlusal protection of fixed component production methods of lost wax casting, polymeric temporary, lost wax and refractory die, light cure composite, light cure composite and metal, all ceramic alumina refractory, technical ceramic, ceromer technology hydro-thermic porcelain and low fusing, ceramic porcelain systems								X
4	quality assured manufacturing techniques, calibration of furnaces, continual evaluation of technical development								X
5	effect of manufacturing procedures upon the clinical and functional performance of the restoration								X
6	the factors which determine the selection of materials in relation to periodontal health								X
<b>S Manufacturing removable prostheses – modifying and maintaining</b>									
1	immediate dentures and additions					X			
2	principles of complete and partial immediate prostheses					X			
3	extraction and alveoplasty techniques					X			
4	modification of models to meet clinical requirements					X			
5	principles of complete immediate prosthesis construction					X			
6	the setting of artificial teeth, alteration of teeth to meet clinical requirements					X			
7	principles of addition of teeth to polymeric prostheses					X			
8	principles of addition of teeth to metallic prostheses					X			
<b>T Manufacturing removable prostheses – repairing</b>									
1	the reasons for fractures of dentures, accidental damage, design faults, changes in underlying bony and mucosal support, materials degradation					X			
2	disinfection procedures for polymeric and metallic/polymeric prostheses					X			
3	identification of fracture plane and mode of fracture					X			

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
4	how to reassemble fractured parts and preparation of model					X			
5	preparation of fractured surfaces in relation to curing method and materials selection					X			
6	application of material and curing procedures					X			
7	fractured artificial teeth					X			
8	identification of tooth material, (polymeric/ceramic), resetting of teeth use of over bites, shade and mould matching					X			
9	preparation of replacement tooth					X			
10	application of new polymer and curing procedures					X			
11	materials selection and techniques of inclusion for strengthening and linking components, effect of fracture mechanics upon component selection					X			
12	effect of disruption of polymer chains by inclusions					X			
U	Manufacturing removable prostheses – relining and rebasing								
1	selection of method and materials, preparation of prostheses prior to procedures					X			
2	clinical re-line impression techniques and impression material identification					X			
3	compatibility of impression materials with denture base plate material					X			
4	disinfection procedures for polymeric and metallic/polymeric prostheses, and re-line impression material					X			
5	complex preparation techniques, casting model and articulating, over bites					X			
6	preparation of existing prosthesis baseplate, waxing, effect of palatal thickness on tongue space and physical performance of prosthesis					X			
7	flasking packing, auto cure techniques					X			
8	processing and finishing procedures					X			
V	Health and safety and the control of infection								
1	methods of protection against contamination and cross-infection when handling received impressions and other items which may have been in the mouth, or which are intended to be placed in the mouth; why it is	X	X	X	X	X	X	X	X

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
	important to do so								
2	the importance of hygiene and maintenance of a clean working environment and equipment	X	X	X	X	X	X	X	X
3	personal hygiene and the use of personal protective equipment	X	X	X	X	X	X	X	X
4	disposal of waste, how to assess and minimise the environmental impact of waste disposal	X							
5	the requirements and procedures of the worker's employing organisation in relation to health and safety and the control of infection.	X							
6	the range of equipment used in the design and manufacture of removable prostheses. methods of using equipment and materials safely (including the use of chemicals and other hazardous substances). methods of storing different equipment and materials safely and securely; methods of cleaning and maintaining different types of equipment and the worker's role in this	X	X	X	X	X	X	X	X
7	handling radioactive material						X		
W	Quality assurance								
1	the reasons for maintaining records throughout the process and of clearly identifying the products during the manufacturing process	X	X	X	X	X	X	X	X
2	organisational procedures and requirements for the recording of information about incoming work, work in progress and work delivered to clients, and the purpose of this	X	X	X	X	X	X	X	X
3	quality audit systems: their purpose, nature and procedures; impact of the Medical Devices Directive on the recording of incoming work, the detailed design and manufacturing specification and the recording of materials and processes	X	X	X	X	X	X	X	X
4	principles of quality assurance (including effective recording and sampling); processes and procedures for quality assurance in the worker's workplace	X	X	X	X	X	X	X	X
5	methods of setting and calibrating equipment and of testing that this is correct	X	X	X	X	X	X	X	X

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Items of knowledge and understanding		EDT05	EDT06	EDT07	EDT08	EDT09	EDT10	EDT11	EDT12
6	the effects of modifying manufacturers' products to meet laboratory requirements on the physical properties of products, on quality assured products and the legal implications (eg of inaccurate mixing, inadequate processing).	X	X	X	X	X	X	X	X
X	Legislation, policies and procedures								
1	the requirements of the Medical Devices Directive in monitoring the progress of devices through the production process	X	X	X	X	X	X	X	X
2	legal requirements of the contract of employment, confidentiality and employers' regulations	X	X	X	X	X	X	X	X
3	legislation relating to health and safety at work, environmental protection, and control of hazardous substances, and related procedures and liability; principles of, and how to apply, legislation and regulations	X	X	X	X	X	X	X	X
4	legal requirements relating to third party insurance.	X	X	X	X	X	X	X	X
Y	Statutory registration								
1	the roles and responsibilities of different members of the oral healthcare team (and the wider health and social care team)	X	X	X	X	X	X	X	X
2	regulatory functions relating to the oral healthcare team in the country in which one is working	X	X	X	X	X	X	X	X
3	legal and ethical obligations of regulated members of the oral healthcare team	X	X	X	X	X	X	X	X
4	the need for lifelong learning and professional development and responsibilities in relation to this for regulated members of the oral healthcare team	X	X	X	X	X	X	X	X
5	the oral healthcare team's wider responsibility to the community as a whole.	X	X	X	X	X	X	X	X

## GLOSSARY

Cast	is a dimensionally accurate positive form of areas of the oral cavity produced from a negative impression.
Client	the member of the oral health care team who has prescribed the custom-made prosthesis. Clients may be external to the organisation (such as other laboratories, dental practitioners, training schools) or internal (eg within a dental hospital).
Die	is a section of a cast of an individual tooth.
Patient	is the individual for whom the custom-made prosthesis is being made and/or the parents/guardians of the patient when s/he is a new-born child