OH18 2012 Design and manufacture cast and wrought metallic components and cast frameworks for removable prostheses

OVERVIEW

This standard focuses on the design and manufacture of wrought and cast frameworks, and metallic components for removable prostheses. You need to manufacture wrought components; design and manufacture burn-out patterns for cast metal frameworks; and devest, trim, finish or use rapid manufacturing techniques and evaluate metallic structures.The term 'client' is used to mean 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 (within a dental hospital). The patient is the individual for whom the custom-made prosthesis is being made.Users of this standard will need to ensure that practice reflects up to date information and policies.Version No 2

KNOWLEDGE AND UNDERSTANDING

You will need to know and understand:

1. the skeletal anatomy, physiology of the head and neck and tooth morphology
2. the structure, function, and movement of the oro-facial musculature including the tongue and temporomandibular joint
3. disorders and diseases affecting the oral cavity
4. the aetiology and classifications of malocclusions
5. the physiological and pathological changes associated with ageing process and trauma related to the oral environment
6. the importance of retention of the periodontal ligament and the changes in proprioception due to loss of periodontal ligament
7. the broader factors (sociological, behavioural, environmental and economic) that contribute to oral health and illness
8. the emotional response by the patient to tooth loss
9. the role of removable prostheses in the restoration and maintenance of:
    1. tissue support
    2. aesthetics
    3. phonetics
    4. function of occlusion and the temporomandibular joint
10. the importance of restoring and maintaining the occlusal vertical dimension
11. the benefits and restrictions of immediate tooth replacement in the provision of

removable prostheses
12. the benefits and restrictions of retaining root structures in the provision of removable prostheses
13. the use and need for transitional removable prostheses
14. the design limitations of large anterior undercuts and pre-existing dental conditions
15. retention and stability
16. aesthetics and phonetics
17. articulation
18. the principles of partial removable prosthesis design
19. the principles and use of digital design and manufacturing
20. the classification and sub-classification of materials on the basis of chemical composition and internal structure
21. the mechanical, physical, thermal, chemical and biological properties of materials
22. refractory materials for cast and mould manufacture or digital representation
23. waxes or alternative materials used in the manufacture of removable prostheses
24. impression, duplicating and cleaning materials
25. wrought and casting alloys
26. dental refractory materials
27. laser and rapid manufacturing and digital technology applied in producing metallic structures
28. methods of developing, maintaining and improving communication and information relating to the provision of custom-made dental devices
29. the importance of communicating with individuals at a pace, in a manner, and at a level appropriate to their understanding, needs and preferences, whilst maintaining their dignity and choice
30. methods of infection control when handling received impressions and other items which may have been in the mouth, or which are intended to be placed in the mouth
31. the purpose of personal protective equipment
32. the range of equipment used in the design and manufacture of dental devices; 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 your role in this
33. the reasons for maintaining records throughout the process and of clearly identifying the products during the manufacturing process
34. 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
35. principles of quality assurance including effective recording and sampling; processes and procedures for quality assurance in your workplace
36. methods of setting and calibrating equipment and of testing that this is correct
37. the effects of modifying manufacturersï¿½ products to meet laboratory requirements on the physical properties of products and on quality assured products, and the legal implications of poor manufacturing
38. legal requirements of the contract of employment, confidentiality and employers' regulations
39. health and safety at work legislation and related procedures and liability; principles of and how to apply, legislation and regulations relating to the manufacturing of devices
40. the role and obligations of members of the dental team and the regulatory functions of the General Dental Council

PERFORMANCE CRITERIA

You must be able to do the following:

1. analyse the cast and identify the optimum position and form of components for a cast framework
2. design a prosthesis that meets the specific requirements of the prescription
3. contact the client without delay if it is not feasible to meet the specific requirements of the prescription to discuss any modifications to design
4. 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 optimum performance
5. select material for the custom-made wrought components and process in a manner which avoids unwanted material stress
6. check components during manufacture to confirm that they are fit for purpose
7. accurately position the components of the prosthesis to ensure that they meet the requirements of the prescription and optimum performance
8. prepare the master cast and duplicate it using materials and processes that produce an accurate copy of the cast
9. prepare appropriate moulds for refractory casts and make accurate refractory model
10. prepare the refractory model appropriately for the casting process
11. transfer the design outline, correctly to the refractory model,select appropriate wax and pre-formed components and produce wax pattern to the refractory model consistent with the design
12. sprue the pattern and make refractory mould to ensure successful casting
13. place it in the furnace and programme heat cycle and burn-out wax
14. remove the mould once the heat cycle has finished and place in the casting machine, select and melt the alloy, and cast into mould
15. devest, trim and polishing the metal alloy structure
16. remove oxides using an appropriate abrasive or chemical treatment
17. visually examine the cast alloy structure, correctly identify any casting faults and assess the viability of casting
18. remove sprues and trim the alloy structure so that the cast structure conforms to the design, function and form
19. evaluate the formed components for their function and take the appropriate remedial action in relation to any that are unacceptable
20. if applicable, use laser or rapid manufacturing and applied digital technology in producing the designed metallic structures
21. finish the alloy structure using appropriate abrasives and polishes and ensure function fit and form
22. effectively clean the finished alloy structure
23. provide Statement of Manufacture for the appliance as required under current regulation

ADDITIONAL INFORMATION

This National Occupational Standard was developed by Skills for Health. It replaces DT08.This standard links with the following dimension within the NHS Knowledge and

Skills Framework (October 2004):Dimension: HWB9 Equipment and devices to meet health and wellbeing needs