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OH24 2012 Design and manufacture metallic bridge sub-structures and metallic bridge components

OVERVIEW

This standard describes the design and manufacture of metallic bridge sub-structures and metallic bridge components. Metallic sub-structures will receive anatomical forms on to them in tooth coloured materials. They are likely to be complex in form given that they combine two or more units. You need to design and manufacture the metallic bridge sub-structures and bridge components, finish and assure their quality ready for fitting in the patient's mouth. The term 'client' is used to mean the member of the oral health care team who has prescribed the restoration.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 restoration is being made. A cast is a dimensionally accurate positive form of areas of the oral cavity produced from a negative impression. A die is a section of cast made of an individual tooth.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 the ageing process and trauma related to the oral environment
6. the importance of retention of the periodontal ligament and the changes in proprioreception due to loss of periodontal ligament
7. the broader factors (sociological, behavioural, environmental and economic) that contribute to oral health and illness
8. articulation
9. aesthetics and phonetics
10. the principles of restoration design
11. the principles and use of digital design and manufacturing
12. the constituents of restorations (onlays, crowns, post and cores, inlays) and how they are made

13. the classification and sub-classification of materials on the basis of chemical composition and internal structure
14. the mechanical, physical, thermal, chemical and biological properties of materials
15. products for cast and mould manufacture
16. waxes
17. dental alloys
18. principles of bridge work
19. methods of constructing dental bridges
20. techniques of soldering used in dental bridgework
21. dental refractory materials
22. the relationship between chemical bonds and the properties of solid materials
23. impression, duplicating and cleaning materials
24. casting patterns
25. methods of sprueing various metals and systems
26. methods of surface finishing
27. methods of developing, maintaining and improving communication and information relating to the provision of custom-made dental devices
28. 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
29. methods of protection against contamination and 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; why it is important to do so
30. the purpose of personal protective equipment
31. 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
32. the reasons for maintaining records throughout the process and of clearly identifying the products during the manufacturing process
33. 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
34. principles of quality assurance including effective recording and sampling; processes and procedures for quality assurance in your workplace
35. methods of setting and calibrating equipment and of testing that this is correct
36. the effects of modifying manufacturers' products to meet laboratory requirements on the physical properties of products and on quality assured products, and the legal implications of poor manufacturing
37. legal requirements of the contract of employment, confidentiality and employers' regulations
38. 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
39. 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. 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 to determine the necessary information for the manufacture of occlusal form
3. form the appropriate abutment retailers in an appropriate pattern material or by use of digital manufacturing
4. form pontics which are required for supporting tooth coloured material and locate them appropriately to the retainers on the abutments
5. convert the pattern using a process appropriate to the alloy and the item
6. retrieve the metallic sub-structure 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 which are required
7. assemble the metallic parts and confirm that components and frameworks are fixed:
    1. securely
    2. in the required position
    3. using an appropriate material
    4. in a manner that enables the optimum join to be made including laser welding
8. 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
9. heat components to be soldered to a temperature that:
    1. is sufficient to melt and control the flow of the solder
    2. is sufficient to form a bond
    3. prevents damage to the metallurgical properties of the component
10. select solder of a type appropriate to the alloy, apply and control the solder to:
    1. give an even flow
    2. achieve the thickness and coverage required by the prescription
11. remove flux, anti-flux and excess solder once soldering is complete
12. place the metallic sub-structure on the cast after soldering and confirm that:
    1. it fits the cast
    2. it complies with the prescription
    3. it will not damage surrounding tissues in the patient's mouth and make any necessary adjustments
13. compare the developing item throughout the process for its harmonisation with:
    1. the patient's natural tooth form
    2. tooth morphology
    3. effects of adjacent natural teeth and of restorations
    4. pontic coronal form
    5. profile of pontic in relation to aesthetics, self cleaning and residual ridge
    6. aesthetic requirements
    7. prescription requirements and make effectively any adjustments which are necessary
14. check the item:
    1. for faults
    2. general fit and undertake any necessary rework
15. create appropriate textures on the different surfaces consistent with:
    1. the alloy
    2. the item's design
    3. the requirements of the prescription
16. finish the item so that it is:

1. capable of maintaining accuracy of fit
2. of the appropriate shape

17. verify the finished sub-structure and bridge components:
    1. for good overall fit of work to die margins and cast parameters
    2. for occlusion and articulation
    3. for proximal contact areas
    4. for appropriate finish of surfaces
    5. against the prescription requirements
18. correctly identify the restoration with the patient's unique reference and date of production
19. effectively clean the finished restoration, prepare and package it safely for despatch together with instructions for the patient and client
20. make complete, accurate and up-to-date records relating to the identification, components and manufacture of the restoration and store the records in the correct location consistent with relevant legislation
21. 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 DT14.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