

QTP 4Y0X2-2
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DENTAL LABORATORY SPECIALTY

Volume 2. Fixed Prosthodontics



381st Training Squadron

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Volume 2, *Fixed Prosthodontics*, contains modules on such procedures as fabricating post and cores; full gold, metal-ceramic, and metal-resin restorations, and porcelain laminate veneers. This QTP is designed to enhance 5- and 7-skill level OJT of dental laboratory personnel. The 4Y0X2 Career Development Courses may be used to compliment the training references listed in a module. All QTPs are intended to be used by trainees, trainers, supervisors, and task certifiers. Before initiating any training you should review your responsibilities—as a supervisor/trainer—for conducting on-the-job training (OJT) per AFI 36-2201, Volume 3, *Air Force Training Program On The Job Training Administration*.

Six months after the apprentice graduates, you should receive a survey that allows you to evaluate the in-residence apprentice course. This poll is a valuable tool; your feedback is critical to improving our 3 level course and your career field. Subsequently, 3-skill level training provides a foundation for your OJT. Once you begin upgrade training you are required to use the QTPs.

QTPs are designed to help you conduct and evaluate your field training. QTPs provide continuity to the trainee's upgrade training and are divided into the following volumes: 1) *General Dental Laboratory Experience*; 2) *Fixed Prosthodontics*; 3) *Treatment and Orthodontic Appliances, Complete and Removable Partial Dentures*; 4) *Dental Laboratory Administration*; 5) *Medical Material*; and 6) *Supervision and Training*. The QTP modules were written to assist you in preparing for and conducting training. You *must* use the QTP modules for training when the STS task is a core task (minimum qualification for the specialty). Each module segments the major tasks into teachable elements. Your goal is to provide enough training and guidance so trainees can do all task related steps, without assistance, and produce an appliance that meets local requirements for speed and accuracy. QTPs also aid OJT task certifiers in evaluating the trainee's demonstrated performance. If you have local training requirements not covered by a QTP module you *should* develop "steps in performance" and "performance checklists" that support and standardize those tasks.

Accompanying each volume of QTPs is a *qualification training progress record*. This QTP record serves as an interim document to record the date trainee completes each module. Every person in qualification/upgrade training *must* have this QTP progress record filed in their OJT folder. Use and annotation of this progress record is similar to current OJT documentation. When *you* are satisfied the trainee meets standards, as prescribed in the QTP performance checklist, *you* must document and initial each task completion date in the "date completed" column in the QTP progress record. If a person is being recertified on a task that is supported by a QTP you must use that module to complete the recertification process.

Typically, you will manage each module by first, training the tasks and then, evaluating performance. Your local steps in performance may vary from the method listed in the QTP module. If this is the case, you are authorized to make changes to the first half of each module, (i.e. steps in task performance); however, the "performance checklist" is considered a *standard* and cannot be altered. You may train each QTP volume/module in any sequence; however, when conducting training use an organized and methodical approach. This will reduce your training time and enhance your efforts.

For effective use of this QTP, conduct training in the following manner:

1. Review the procedures in each module with the trainee.
2. Direct the trainee to review the training references listed to prepare for task performance.
3. Review the steps in task performance with the trainee, allowing enough time to adequately train each step (some modules may take longer to teach).
4. Evaluate the trainee's work at each critical step—using the performance checklist at this point will be helpful.
5. Fifth, evaluate the trainee's performance and provide feedback on any areas for improvement.
6. Finally, when the trainee has successfully completed the task you must document and initial both the STS and the QTP progress record. If the trainee does not accomplish the module, conduct follow-up instruction until the trainee successfully completes the task.

The QTP project goal of the 381st Training Squadron, Sheppard AFB TX, is to publish a useable document for trainers and trainees. You are encouraged to write-in changes or revisions to the QTPs. A corrections/improvements letter is located on the last page of each QTP volume. You may choose to call in your recommendations to DSN 736-6906 or FAX DSN/Commercial 736-2781 or (940) 676-2781 or email the author at andrea.bates@sheppard.af.mil.

The inclusion of names of any specific commercial product, commodity, or service in this publication is for informational purposes only and does not imply endorsement by the Air Force.

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MODULE 1. FABRICATE POST AND CORES

STS TASK REFERENCE(S):

4.4 Fabricate post and cores

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to fabricate post and cores following either locally established procedures or steps in task performance below. In waxing the pattern, emphasize the need for the post to completely fill the canal to the apical tip. Explain how to wax-up a properly contoured core to simulate a crown preparation. Ensure adequate space for subsequent crown fabrication. Have the trainee fabricate post and cores and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Vibrator	Bunsen Burner
Air Abrasive Unit	Burs
Bench Lathe	Casting Investment
Burnout Oven	Cutting Disk
Casting Alloy	Debubbler
Ultrasonic Cleaner	Disinfectant Solution
Casting Machine	Graduated Cylinder
Dead Soft Wax	Handpiece
Disclosing Medium	Mixing Bowl
Distilled Water	Sprue Former
Inlay wax	Torch
Investment Ring	Vacuum Mixer
Rubber Points and Wheels	Waxing Instruments
Spruing Wax/plastic sprues	

STEPS IN TASK PERFORMANCE:

1. Inspect cast for voids or nodules
2. Have prescribing dentist identify margins, if necessary
3. Apply separating medium to interior of preparation and entire area that will be waxed
4. Cut notches in plastic sprue to aid in retention of wax
5. Trim tip of plastic sprue to fit into root canal to extend to bottom of preparation
6. Fill apical end of canal with dead soft wax using PKT No. 2

MODULE 1. FABRICATE POST AND CORES

STEPS IN TASK PERFORMANCE (CONTINUED):

7. Warm sprue slightly (not melting) and insert completely in wax
8. Allow wax to cool and remove wax post
9. Rewax if pattern has voids or breaks
10. Replace pattern in previous position
11. Build up core of pattern with inlay wax to simulate contours of an ideal crown preparation
12. Refine margins of pattern using preferred waxing instrument
13. Sprue post and core pattern on incisal or occlusal surface
14. Invest pattern, with no ring liner and/or add 1 or 2 cc more water to reduce expansion
15. Cast pattern with requested metal
16. Divest and deoxidize casting
17. Remove nodules using burs or stones
18. Check casting fit using disclosing medium and gently seating casting into preparation
19. Relieve spots disclosed by medium, repeat until casting seats into preparation and margins are closed
20. Desprue casting
21. Recontour the sprue attachment area
22. Finish core area using stones and rubber wheel
23. Air abrade entire casting
24. Place casting in ultrasonic cleaner for 2 to 3 minutes
25. Disinfect restoration

MODULE 1. FABRICATE POST AND CORES

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to fabricate post and cores and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FABRICATE POST AND CORES		
DID THE TRAINEE...?	YES	NO
1. Inspect the cast to ensure it is free of voids and nodules		
2. Apply die separator over entire area to be waxed		
3. Fill the canal to the apical end with wax		
4. Wax post and core to correct contours		
5. Sprue post and core pattern on incisal or occlusal surface		
6. Invest pattern to produce acceptable mold expansion		
7. Cast pattern producing an accurate, dense casting		
8. Fit casting without damaging master cast		
9. Contour to correct shape, finish to smooth surface, and air abrade entire casting		
10. Disinfect restoration		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 2. PREPARE DIES FOR WAXING

STS TASK REFERENCE(S):

4.6.1 Prepare dies for waxing

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to prepare dies for wax. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Die Sealer	Blockout Material
Die Spacer	Die Lubricant
Wax Pencil (Red & Blue)	

STEPS IN TASK PERFORMANCE:

1. Inspect die preparation for undercuts or nodules in pattern area
2. Check bite for adequate reduction
3. Verify mounting and check for proper contact of existing teeth
4. Adjust articulator settings to corresponds with wear facets and/or prescribed guidance
5. Blockout any undercuts with blockout material
6. Mark thin red line on margins using wax pencil
7. Apply die sealer and allow to dry
8. When directed by the dentist, apply spacer following manufacturer's recommendations
9. Do not apply spacer within 1.0 mm of margins
10. Apply additional coats of die spacer, if required and allow to dry
11. Apply die lubricant to pattern area and opposing teeth

MODULE 2. PREPARE DIES FOR WAXING

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to prepare dies for wax and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

PREPARE DIES FOR WAXING		
DID THE TRAINEE...?	YES	NO
1. Inspect the dies for suitability		
2. Blockout any undercuts with blockout material		
3. Mark thin red line on margins using wax pencil		
4. Apply die sealer and allow to dry		
5. Apply spacer keeping 1.0 mm above margins, if requested by dentist		
6. Apply die lubricant to pattern area and opposing teeth		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 3. WAX PATTERNS (SINGLE METAL)

STS TASK REFERENCE(S):

4.6.2 Wax patterns

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to wax patterns. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Die Lubricant	Bunsen Burner
Rubber Dam	Microscope
Wax Gauge	Wax Powder
Waxing Instruments	Inlay Wax
Casts -- Articulated	

STEPS IN TASK PERFORMANCE:

1. Apply hot inlay wax to dies in rapid manner to prevent voids in wax copings
2. Trim wax from margin area using blunt carving instrument
3. Remove wax patterns using rubber dam
4. Inspect patterns for voids on internal surface and remake copings if required
5. Replace patterns on dies and reseal margins with inlay wax
6. Close articulator and check patterns for occlusal interference
7. Overbuild the occlusal surface and gently, but quickly, close articulator again to create a centric occlusal contact in the softened wax
8. Carve the wax back to proper anatomical and functional contours
9. Use the instrument in a palm grip to make forceful long strokes
10. Use a pen grip and finger rest for creating fine details
11. See training references for specific anatomic and functional contouring
12. Check lateral excursions for clearance and proper cusp tip placement
13. Apply wax powder to occlusal surface, disclose interferences, and remove excess wax
14. Wax secondary anatomy using existing teeth as guides
15. Refine axial contours and verify "A, B, C" contacts, using powdered wax
16. Adjust lateral and protrusive excursions
17. Verify correct proximal contact position
18. Remove wax patterns using rubber dam and apply die lubricant
19. Replace patterns on dies and refine margins
20. Use magnification to verify accuracy of margins
21. Clean patterns using preferred method

MODULE 3. WAX PATTERNS (SINGLE METAL)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to wax patterns and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

WAX PATTERNS		
DID THE TRAINEE...?	YES	NO
1. Inspect the dies for suitability and prepare dies as prescribed		
2. Wax copings without creating voids		
3. Carve cusp tips in proper position (cusp-to-fossa and/or cusp-to-embrasure)		
4. Carve marginal ridges to proper contour and correct occlusion		
5. Carve triangular ridges to correct occlusion		
6. Accurately refine margins of wax pattern using magnification		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 4. SPRUE AND INVEST WAX PATTERN (SINGLE METAL)

STS TASK REFERENCE(S):

4.6.3 Sprue and invest wax pattern

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to sprue and invest wax patterns. Explain the significance of how proper sprue diameter and placement can decrease porosity in the casting. Estimate the amount of alloy needed for the casting based on the weight of the wax pattern and the specific gravity of the alloy. Describe the purpose of the orientation dot and show where it is placed on the sprue former. Have the trainee sprue and invest wax patterns and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Hose	Bunsen Burner
Casting Ring	Sprue Base
Debubbler	Casting Ring Liner
Electronic Scale	Distilled Water
Inlay Wax	Graduated Cylinder
Millimeter Ruler	Investment
Small Artist Brush	Pen/Pencil
Sprue Former	Spatula
Sticky Wax	Sprue Wax
Vacuum Mixing Bowl	Vacuum Mixer
Waxing Instruments	Vibrator

STEPS IN TASK PERFORMANCE:

1. Inspect wax patterns on dies for suitability
2. Determine required size of sprue leads
3. Determine initial weight of sprue base using electronic scale before sprues are attached
4. Document weight of sprue base
5. Sticky-wax sprue leads to thickest part of patterns at 45° angle
6. Sticky-wax sprue leads to incisal edge of patterns for anterior units
7. Seal sprue leads to patterns using inlay wax

MODULE 4. SPRUE AND INVEST WAX PATTERN (SINGLE METAL)

STEPS IN TASK PERFORMANCE (CONTINUED):

8. Trim sprue lead lengths to approximately 6.0 mm for direct and 3.0 mm for indirect method
9. Remove patterns from dies
10. Sticky wax opposite end of sprue leads to sprue base
11. Position patterns outside of the thermal zone of the investment
12. Seal sprue leads to sprue base using inlay wax
13. Place sprue base assembly on electronic scale
14. Document weight of patterns and sprue base assembly
15. Compute difference of the two weights to determine weight of wax patterns
16. Determine the amount of alloy needed, for casting, by multiplying the wax pattern weight times the alloy's specific gravity
17. Secure ring liner 3.0 mm below edge of casting ring (if not using the ringless method)
18. Place orientation dot on sprue base
19. Place casting ring on sprue base
20. Apply debubbler to all surfaces of wax patterns and dry thoroughly
21. Vacuum mix investment IAW manufacturer's instructions
22. Paint on investment inside wax patterns using brush
23. Attach lined casting ring to sprue base
24. Fill casting ring with investment
25. Allow investment to set IAW manufacturer instructions

MODULE 4. SPRUE AND INVEST WAX PATTERN (SINGLE METAL)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to sprue and invest wax pattern and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

SPRUE AND INVEST WAX PATTERN		
DID THE TRAINEE...?	YES	NO
1. Use the correct gauge and length of sprue		
2. Sprue to thickest part of the wax patterns		
3. Position patterns out of the thermal zone		
4. Secure liner in casting ring correctly		
5. Apply debubbler and dry thoroughly		
6. Mix the correct investment IAW manufacturer's direction		
7. Invest the pattern without creating voids		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 5. BURNOUT AND CAST RESTORATION (SINGLE METAL)

STS TASK REFERENCE(S):

4.6.4 Burnout and cast restoration

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to burnout and cast restoration. Stress the need to balance the casting arm and ensure the mold is damp prior to burnout. Explain why separate crucibles are used for different types of alloys. Have the trainee burnout and cast restorations and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Casting Torch (Gas/Air, Gas/Oxygen)	Burnout Furnace
Casting Alloy	Casting Flux
Casting Machine	Safety Goggles
Knife	Tongs
Striker	

STEPS IN TASK PERFORMANCE:

1. Ensure burnout furnace is at room temperature
2. Ensure molds are moist prior to burnout
3. Remove glaze from top of investment
4. Balance casting arm, if necessary
5. Place casting rings in back and center of furnace with orientation dot to the right
6. Program furnace per manufacturer's instructions to ensure complete burnout
7. Ensure proper cradle is in place
8. Place appropriate crucible in machine
9. Wind broken-arm casting machine
10. Preheat crucible using furnace or torch
11. Ensure at least 50 percent new alloy is added to recycled alloy
12. Place alloy in crucible and melt using torch
13. Apply casting flux, if required
14. Remove casting ring from furnace and place in cradle
15. Release broken arm mechanism when metal reaches proper temperature
16. Remove casting ring after arm completely stops spinning

MODULE 5. BURNOUT AND CAST RESTORATION (SINGLE METAL)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to burnout and cast restoration and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

BURNOUT AND CAST RESTORATION		
DID THE TRAINEE...?	YES	NO
1. Prepare mold for burnout and balance the casting machine		
2. Set and load the burnout furnace correctly		
3. Ensure molds were burned out completely		
4. Cast restorations with properly adjusted casting torch		
5. Adhere to all safety precautions while operating casting machine and torch		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 6. DIVEST CASTING (SINGLE METAL)

STS TASK REFERENCE(S):

4.6.5 Divest casting

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to divest casting. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive
Safety Goggles
Tongs
Knife

STEPS IN TASK PERFORMANCE:

1. Cool ring IAW alloy manufacturer's instructions
2. Divest and deoxidize castings using air abrasive unit
3. Inspect casting for completeness

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to divest casting and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

DIVEST CASTING		
DID THE TRAINEE...?	YES	NO
1. Divest and deoxidize castings without damaging casting		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 7. ADJUST CASTING (SINGLE)

STS TASK REFERENCE(S):

4.6.6 Adjust casting

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to adjust a casting. Describe what the trainee should look for on the internal surface of the casting using a microscope. Stress the importance of margins, contacts, contours, and occlusion of the restorations. Have the trainee adjust fixed restorations and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Articulating Paper	Separating Disk
Finishing Burs, Stones, and Wheels	Indicating Medium
Handpiece or Lathe	Shimstock
Microscope	

STEPS IN TASK PERFORMANCE:

1. Inspect castings for completeness
2. Inspect internal surface of castings under magnification for nodules, voids, and residual investment
3. Remove positive defects using a bur
4. Apply disclosing medium to identify interferences on the intaglio surface of crown
5. Carefully seat castings on dies and evaluate fit, do not abrade the dies
6. Inspect interior of castings for high spots
7. Grind indicated high spot areas
8. Repeat fitting process until castings are fully seated
9. Confirm accuracy of margins
10. Gently clean disclosing medium from die using soft brush, soap, and water
11. Clean indicating medium from casting using steam cleaner
12. Desprue castings using separating disk, avoiding cutting into crown
13. Contour sprue stump using heatless stone or bur
14. Seat restorations on working cast
15. Adjust proximal contacts independently using articulating paper, stones, and rubber wheels
16. Repeat adjusting proximal contacts until restorations seat on solid cast
17. Verify proximal contacts with shimstock

MODULE 7. ADJUST CASTING (SINGLE)

STEPS IN TASK PERFORMANCE (CONTINUED):

18. Adjust centric and eccentric occlusion of restorations on working cast
19. Maintain proper contours

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to adjust castings and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

ADJUST CASTING (SINGLE)		
DID THE TRAINEE...?	YES	NO
1. Remove all nodules or defects on interior surface of castings prior to seating		
2. Disclose any high spots and accurately remove interferences during seating		
3. Properly fit the castings to the dies		
4. Adjust proximal contacts on restorations until shimstock slightly drags		
5. Restore occlusion to original VDO and eliminate eccentric interferences		
6. Maintain proper emergence profile and height of contour		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 8. SOLDER CROWN

STS TASK REFERENCE(S):

4.6.7 Solder crown

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to prepare and solder a crown to add a proximal contact or repair a hole. Stress the importance of cleanliness of the solder area. Explain how to select the appropriate solder. Emphasize the importance of preheating the investment prior to soldering. Stress the importance of removing torch immediately after the solder “wets” the parent alloy. Have the trainee solder crowns and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Distilled Water	Finishing and Polishing Burs, Points, and Wheels
Flux	Graduated Cylinder
Handpiece	Lathe
Platinum Foil	Solder
Soldering Investment	Soldering Stand
Spatula	Sticky Wax
Sticky wax	Mixing Bowl
Striker	Tongs
Torch with Soldering Tip	Deoxidizing Agent/Abrasive
Tweezers	Bard Parker
Bunsen Burner	Burnout Furnace

STEPS IN TASK PERFORMANCE:

Adding a proximal contact

1. Prepare proximal area using clean rubber wheels and points
2. Confine the solder to the desired area with graphite or another anti-flux
3. Adjust Bunsen burner to maximize the temperature of the reducing portion of the flame
4. Select the solder and cut a piece larger than the contact area
5. Hold the crown with a pair of soldering tweezers
6. Warm the crown over the flame and apply flux
7. Dip the solder segment into the flux
8. Position the proximal surface horizontally and add the solder
9. Hold the crown with solder in the reducing zone of the flame
10. Heat the crown until it turns red and the solder begins to flow

MODULE 8. SOLDER CROWN

STEPS IN TASK PERFORMANCE (CONTINUED):

11. Quench the crown

Repairing a hole

1. Prepare area surrounding hole using clean rubber points
2. Confine the solder to the desired area with graphite or another anti-flux
3. Position platinum foil over the die
4. Seat the crown over the platinum foil on the die
5. Sticky wax platinum foil to crown through the hole
6. Remove crown with the platinum foil attached
7. Hand mix solder investment per manufacturer's directions
8. Place investment into crown
9. Invert crown onto investment patty
10. Ensure margins are embedded in solder patty
11. Preheat solder patty in 900 °F burnout furnace for 30 minutes
12. Remove patty from furnace and place on soldering stand
13. Apply flux and solder to solder area
14. Evenly heat crown using reducing portion of torch flame
15. Direct flame surrounding solder area
16. Quench the crown and patty
17. Divest and deoxidize crown
18. Remove platinum foil
19. Seat crown on die

MODULE 8. SOLDER CROWN

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to solder crowns and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

SOLDER CROWN		
DID THE TRAINEE...?	YES	NO
1. Prepare the solder area		
2. Invest the crown, covering all margins		
3. Select appropriate solder		
4. Apply flux and anti-flux		
5. Burnout invested crown to proper time/temperature		
6. Use reducing zone of flame		
7. Accurately solder a proximal contact or solder a hole		
8. Reseat crown on to die		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 9. FINISH AND POLISH RESTORATION

STS TASK REFERENCE(S):

4.6.8 Finish and polish restoration

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to finish and polish a restoration. Describe what the trainee should look for on the internal surface of the casting using a microscope. Stress the importance of margins, contacts, contours, and occlusion of the restorations. Have the trainee finish and polish fixed restorations and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Articulating Paper	Buffing Bar Compound (BBC)
Finishing and Polishing Burs, Points, and Wheels	Handpiece or Lathe
Heatless Stone	Indicating Medium
Microscope	Rouge
Separating Disk	Shimstock
Soap	Steam or Ultrasonic Cleaner

STEPS IN TASK PERFORMANCE:

1. Matte finish restorations using stones, avoiding previously adjusted areas
2. Rubber all restoration surfaces
3. Polish restorations using buffing bar compound (BBC) or equivalent, soft bristle brushes, and rag or felt wheel
4. Final polish restorations, using jewelers rouge, soft bristle brush, and rag or felt wheels
5. Clean restorations using steam or ultrasonic cleaner
6. Check proximal and occlusal contacts with shimstock
7. Check fit of casting to ensure accurate margins
8. Disinfect restoration

MODULE 9. FINISH AND POLISH RESTORATION

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to finish and polish a restoration and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FINISH AND POLISH RESTORATION		
DID THE TRAINEE...?	YES	NO
1. Finish and polish restorations to a high luster		
2. Maintain desired occlusal and proximal contacts		
3. Maintain margin integrity		
4. Clean and disinfect restorations		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 10. PREPARE DIES FOR WAXING

STS TASK REFERENCE(S):

4.7.1 Prepare dies for waxing

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to prepare dies for waxing. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Die Sealer	Blockout Material
Die Spacer	Die Lubricant
Wax Pencil (Red & Blue)	

STEPS IN TASK PERFORMANCE:

1. Inspect die preparation for undercuts or nodules in pattern area
2. Check bite for adequate reduction
3. Verify mounting and check for proper contact of existing teeth
4. Adjust articulator settings to corresponds with wear facets and/or prescribed guidance
5. Blockout any undercuts with blockout material
6. Mark thin red line on margins using wax pencil
7. Apply die sealer and allow to dry
8. When directed by the dentist, apply spacer following manufacturer's recommendations
9. Do not apply spacer within 1.0 mm of margins
10. Apply additional coats of die spacer, if required, and allow to dry
11. Apply die lubricant to pattern area and opposing teeth

MODULE 10. PREPARE DIES FOR WAXING

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to prepare dies for waxing and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

PREPARE DIES FOR WAXING		
DID THE TRAINEE...?	YES	NO
1. Inspect the dies for suitability		
2. Blockout any undercuts with blockout material		
3. Mark thin red line on margins using wax pencil		
4. Apply die sealer and allow to dry		
5. Apply spacer keeping 1.0 mm above margins, if requested by dentist		
6. Apply die lubricant to pattern area and opposing teeth		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 11. WAX PATTERNS (FPD)

STS TASK REFERENCE(S):

4.7.2 Wax patterns

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*

EVALUATION INSTRUCTIONS:

Demonstrate how to wax patterns. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Die Lubricant	Bunsen Burner
Rubber Dam	Microscope
Wax Gauge	Wax Powder
Waxing Instruments	Inlay wax
Casts -- Articulated	

STEPS IN TASK PERFORMANCE:

1. Apply hot inlay wax to dies in rapid manner to prevent voids in wax copings
2. Trim wax from margin area using blunt carving instrument
3. Remove wax patterns using rubber dam
4. Inspect patterns for voids on internal surface and remake copings if required
5. Replace patterns on dies and reseal margins with inlay wax
6. Close articulator and check patterns for occlusal interference
7. Overbuild the occlusal surface and gently, but quickly, close articulator again to create a centric occlusal contact in the softened wax
8. Carve the wax back to proper anatomical and functional contours
9. Use the instrument in a palm grip to make forceful long strokes
10. Use a pen grip and finger rest for creating fine details
11. See training references for specific anatomic and functional contouring
12. Check lateral excursions for clearance and proper cusp tip placement
13. Apply wax powder to occlusal surface, disclose interferences, and remove excess wax
14. Wax secondary anatomy using existing teeth as guides
15. Refine axial contours and verify "A, B, C" contacts, using powdered wax
16. Adjust lateral and protrusive excursions
17. Verify correct proximal contact position
18. Remove wax patterns using rubber dam and apply die lubricant
19. Replace patterns on dies and refine margins
20. Use magnification to verify accuracy of margins
21. Clean patterns using preferred method

MODULE 11. WAX PATTERNS (FPD)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to wax patterns and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

WAX PATTERNS (FPD)		
DID THE TRAINEE...?	YES	NO
1. Inspect the dies for suitability and prepare dies as prescribed		
2. Wax copings without creating voids		
3. Carve cusp tips in proper position (cusp-to-fossa and/or cusp-to-embrasure)		
4. Carve marginal ridges to proper contour and correct occlusion		
5. Carve triangular ridges to correct occlusion		
6. Wax pontic to correct contour and occlusion		
7. Accurately refine margins of wax pattern using magnification		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 12. SPRUE AND INVEST WAX PATTERN (FPD)

STS TASK REFERENCE(S):

4.7.3 Sprue and invest wax pattern

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to sprue and invest wax patterns using either the direct or indirect technique. Explain the significance of how proper sprue diameter and placement can decrease porosity in the casting. Estimate the amount of alloy needed for the casting based on the weight of the wax pattern and the specific gravity of the alloy. Describe the purpose of the orientation dot and show where it is placed on the sprue former. Have the trainee sprue and invest wax patterns and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Hose	Bunsen Burner
Casting Ring	Sprue Base
Debubblizer	Casting Ring Liner
Electronic Scale	Distilled Water
Inlay Wax	Graduated Cylinder
Millimeter Ruler	Investment
Small Artist Brush	Pen/Pencil
Sprue Former	Spatula
Sticky Wax	Sprue Wax
Vacuum Mixing Bowl	Vacuum Mixer
Waxing Instruments	Vibrator

STEPS IN TASK PERFORMANCE:

1. Inspect wax patterns on dies for suitability
2. Determine required size of sprue leads
3. Determine initial weight of sprue base using electronic scale before sprues are attached
4. Document weight of sprue base
5. Sticky-wax sprue leads to thickest part of patterns at 45° angle
6. Sticky-wax sprue leads to incisal edge of patterns for anterior units
7. Seal sprue leads to patterns using inlay wax

MODULE 12. SPRUE AND INVEST WAX PATTERN (FPD)

STEPS IN TASK PERFORMANCE (CONTINUED):

8. Trim sprue lead lengths to approximately 6.0 mm for direct and 3.0 mm for indirect method
9. Remove patterns from dies
10. Sticky wax opposite end of sprue leads to sprue base
11. Position patterns outside of the thermal zone of the investment
12. Seal sprue leads to sprue base using inlay wax
13. Place sprue base assembly on electronic scale
14. Document weight of patterns and sprue base assembly
15. Compute difference of the two weights to determine weight of wax patterns
16. Determine the amount of alloy needed, for casting, by multiplying the wax pattern weight times the alloy's specific gravity
17. Secure ring liner 3.0 mm below edge of casting ring (if not using the ringless method)
18. Place orientation dot on sprue base
19. Place casting ring on sprue base
20. Apply debubbler to all surfaces of wax patterns and dry thoroughly
21. Vacuum mix investment IAW manufacturer's instructions
22. Paint on investment inside wax patterns using brush
23. Attach lined casting ring to sprue base
24. Fill casting ring with investment
25. Allow investment to set IAW manufacturer instructions

MODULE 12. SPRUE AND INVEST WAX PATTERN (FPD)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to sprue and invest wax pattern and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

SPRUE AND INVEST WAX PATTERN		
DID THE TRAINEE...?	YES	NO
1. Use the correct gauge and length of sprue		
2. Sprue to thickest part of the wax patterns		
3. Position patterns out of the thermal zone		
4. Secure liner in casting ring correctly		
5. Apply debubbler and dry thoroughly		
6. Mix the correct investment IAW manufacturer's direction		
7. Invest the pattern without creating voids		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 13. BURNOUT AND CAST RESTORATION (FPD)

STS TASK REFERENCE(S):

4.7.4 Burnout and cast restoration

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions

EVALUATION INSTRUCTIONS:

Demonstrate how to burnout and cast restoration. Stress the need to balance the casting arm and ensure the mold is damp prior to burnout. Explain why separate crucibles are used for different types of alloys. Have the trainee burnout and cast restorations and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Casting Torch (Gas/Air, Gas/Oxygen)	Burnout Furnace
Casting Alloy	Casting Flux
Casting Machine	Safety Goggles
Knife	Tongs
Striker	

STEPS IN TASK PERFORMANCE:

1. Ensure burnout furnace is at room temperature
2. Ensure molds are moist prior to burnout
3. Remove glaze from top of investment
4. Balance casting arm, if necessary
5. Place casting rings in back and center of furnace with orientation dot to the right
6. Program furnace per manufacturer's instructions to ensure complete burnout
7. Ensure proper cradle is in place
8. Place appropriate crucible in machine
9. Wind broken-arm casting machine
10. Preheat crucible using furnace or torch
11. Ensure at least 50 percent new alloy is added to recycled alloy
12. Place alloy in crucible and melt using torch
13. Apply casting flux, if required
14. Remove casting ring from furnace and place in cradle
15. Release broken arm mechanism when metal reaches proper temperature
16. Remove casting ring after arm completely stops spinning

MODULE 13. BURNOUT AND CAST RESTORATION (FPD)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to burnout and cast restoration and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

BURNOUT AND CAST RESTORATION		
DID THE TRAINEE...?	YES	NO
1. Prepare mold for burnout and balance the casting machine		
2. Set and load the burnout furnace correctly		
3. Ensure molds were burned out completely		
4. Cast restorations with properly adjusted casting torch		
5. Adhere to all safety precautions while operating casting machine and torch		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 14. DIVEST CASTING (FPD)

STS TASK REFERENCE(S):

4.7.5 Divest casting

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to divest casting. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit Tongs
Safety Goggles Knife

STEPS IN TASK PERFORMANCE:

1. Cool ring IAW alloy manufacturer's instructions
2. Divest and deoxidize castings using air abrasive unit
3. Inspect casting for completeness

MODULE 14. DIVEST CASTING (FPD)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to divest casting and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

DIVEST CASTING		
DID THE TRAINEE...?	YES	NO
1. Divest and deoxidize castings without damaging casting		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 15. ADJUST CASTING (FPD)

STS TASK REFERENCE(S):

4.7.6 Adjust casting

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to adjust a casting. Describe what the trainee should look for on the internal surface of the casting using a microscope. Stress the importance of margins, contacts, contours, and occlusion of the restorations. Have the trainee adjust fixed restorations and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Articulating Paper	Separating Disk
Finishing Burs, Stones, and Wheels	Indicating Medium
Handpiece or Lathe	Shimstock
Microscope	

STEPS IN TASK PERFORMANCE:

1. Inspect castings for completeness
2. Inspect internal surface of castings under magnification for nodules, voids, and residual investment
3. Remove positive defects using a bur
4. Apply disclosing medium to identify interferences on the intaglio surface of crown
5. Carefully seat castings on dies and evaluate fit, do not abrade the dies
6. Inspect interior of castings for high spots
7. Grind indicated high spot areas
8. Repeat fitting process until castings are fully seated
9. Confirm accuracy of margins
10. Gently clean disclosing medium from die using soft brush, soap, and water
11. Clean indicating medium from casting using steam cleaner
12. Desprue castings using separating disk, avoiding cutting into crown
13. Contour sprue stump using heatless stone or bur
14. Seat restorations on working cast
15. Adjust proximal contacts individually using articulating paper, stones, and wheels
16. Repeat adjusting proximal contacts until restorations seat on solid cast
17. Verify proximal contacts with shimstock
18. Adjust centric and eccentric occlusion of restorations on working cast
19. Maintain proper contours

MODULE 15. ADJUST CASTING (FPD)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to adjust a casting and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

ADJUST CASTING (FPD)		
DID THE TRAINEE...?	YES	NO
1. Remove all nodules or defects on interior surface of castings prior to seating		
2. Disclose any high spots and accurately remove interferences during seating		
3. Properly fit the castings to the dies		
4. Adjust proximal contacts on restorations until shimstock slightly drags		
5. Restore occlusion to original VDO and eliminate eccentric interferences		
6. Maintain proper emergence profile and height of contour		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 16. SOLDER CROWN (FPD)

STS TASK REFERENCE(S):

4.7.7 Solder crown

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to prepare and solder a fixed partial denture. Stress the importance of cleanliness of the solder area. Explain how to select the appropriate solder. Emphasize the importance of preheating the investment prior to soldering. Stress the importance of removing torch immediately after the solder “wets” the parent alloy. Have the trainee solder crowns and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Distilled Water	Finishing and Polishing Burs, Points, and Wheels
Flux	Graduated Cylinder
Handpiece	Lathe
Dura-Lay or the equivalent	Solder
Soldering Investment	Soldering Stand
Spatula	Sticky Wax
Sticky wax	Mixing Bowl
Striker	Tongs
Torch with Soldering Tip	Deoxidizing Agent/Abrasive
Tweezers	Bard Parker
Platinum Foil	Burnout Furnace

STEPS IN TASK PERFORMANCE:

Adding a proximal contact

1. Prepare proximal area using clean rubber wheels and points
2. Confine the solder to the desired area with graphite or another anti-flux
3. With an FPD it is recommended that you invest the retainers to prevent possibly warping the FPD when heating.
4. Select the solder and cut a piece larger than the contact area
5. Preheat solder patty in oven, 900 °F burnout furnace for 30 minutes
6. Dip the solder segment into the flux
7. Remove patty from oven and place on soldering stand
8. Apply flux and solder to solder area
9. Evenly heat crown using reducing portion of torch flame
10. Direct flame surrounding solder area

MODULE 16. SOLDER CROWN (FPD)

STEPS IN TASK PERFORMANCE (CONTINUED):

Adding a proximal contact

11. Once the solder has flowed remove flame immediately
12. Let solder patty bench cool before removing FPD

Repairing a hole

1. Prepare area surrounding hole using clean rubber points
2. Confine the solder to the desired area with graphite or another anti-flux
3. Position platinum foil over the die
4. Seat the crown over the platinum foil on the die
5. Sticky wax platinum foil to FPD retainer through the hole
6. Remove retainer with the platinum foil attached
7. Hand mix solder investment per manufacturer's directions
8. Place investment into FPD retainers
9. Invert FPD onto investment patty
10. Ensure margins are embedded in solder patty
11. Preheat solder patty in 900 °F burnout furnace for 30 minutes
12. Remove patty from furnace and place on soldering stand
13. Apply flux and solder to solder area
14. Evenly heat crown using reducing portion of torch flame
15. Direct flame surrounding solder area
16. Let solder patty bench cool before removing the FPD
17. Divest and deoxidize crown
18. Remove platinum foil
19. Seat crown on die

MODULE 16. SOLDER CROWN (FPD)

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to solder crowns and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

SOLDER CROWN (FPD)		
DID THE TRAINEE...?	YES	NO
1. Prepare the solder area		
2. Invest the retainers, covering all margins		
3. Select appropriate solder		
4. Apply flux and anti-flux		
5. Burnout invested crown to proper time/temperature		
6. Use reducing zone of flame		
7. Accurately solder a proximal contact or solder a hole		
8. Let solder patty bench cool before removing FPD		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 17. SOLDER FIXED PARTIAL DENTURE

STS TASK REFERENCE(S):

4.7.8 Solder fixed partial denture

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to prepare and solder a fixed partial denture (FPD). Explain how an accurate relationship between the units of a FPD is critical to the success of the soldering procedure. The relationship can be maintained in either of two ways; the stone index method, or the autopolymerizing resin method. This module describes the autopolymerizing resin method. Stress the importance of cleanliness of the solder joint area. Explain how to select the appropriate solder. Emphasize the importance of preheating the investment prior to soldering. Stress the importance of removing the torch immediately after the solder “wets” the parent alloy. Have the trainee solder FPDs and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate their abilities using the performance checklist.

PERFORMANCE RESOURCES:

Autopolymerizing Resin	Bard Parker
Burnout Furnace	Deoxidizing agent/abrasive
Distilled Water	Finishing and Polishing Burs, Points, and Wheels
Flux	Graduated Cylinder
Handpiece	Lathe
Inlay wax	Mixing Bowl
Polishing Compound	Solder
Soldering Investment	Soldering Stand
Spatula	Sticky Wax
Striker	Tongs
Torch with Soldering Tip	Tweezers
Goggles	

STEPS IN TASK PERFORMANCE:

1. Seat retainers on solid cast and verify fit with a microscope
2. Select a solder with a melting range 100° F below that of the casting alloy
3. Adjust solder gap width to approximately 0.25 mm
4. Prepare a clean, satin finished solder joint using a rubber wheel
5. Sticky wax retainers to cast

MODULE 17. SOLDER FIXED PARTIAL DENTURE

STEPS IN TASK PERFORMANCE (CONTINUED):

6. Adjust a piece of solder of suitable size and shape to fit the solder gap
7. Fill solder joint area with acrylic resin
8. Apply resin to the occlusal surface and strengthen the relation with a bur (allow resin to polymerize)
9. Verify the fit on the solid cast
10. Hand mix solder investment per manufacturer's directions
11. Remove FPD from cast as a unit
12. Fill retainers with solder investment
13. Invert onto investment patty, covering margins but leaving the maximum amount of metal exposed for solder application
14. Allow solder patty to set up
15. Trim solder patty to a vertical thickness of 15-20 mm and a horizontal width of at least 3 mm from units; round edges of patty
16. Carve "V" shaped-channels into solder patty at solder joint areas
17. Ensure margins remain embedded in solder patty
18. Preheat solder assembly in 900° F burnout furnace for 30 minutes
19. Remove assembly from furnace and place on soldering stand
20. Check that all resin is burned out
21. Apply flux and position solder in solder joint area
22. Evenly heat entire assembly using reducing zone of flame
23. Direct flame to units adjacent to solder area until units are dull red
24. Concentrate flame on solder gap area until solder flows
25. Bench cool FPD to room temperature; Do not quench
26. Divest and deoxidize FPD

MODULE 17. SOLDER FIXED PARTIAL DENTURE

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to solder fixed partial dentures and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

SOLDER FIXED PARTIAL DENTURE		
DID THE TRAINEE...?	YES	NO
1. Prepare the solder joint area and seat the retainers completely on solid cast		
2. Invest the units covering all margins		
3. Trim patty width no less than 3 mm from units		
4. Trim patty depth to a range of 15-20 mm		
5. Carve a "V" notch at solder joint area		
6. Select appropriate solder		
7. Burnout invested units to proper time/temperature		
8. Accurately produce a solder joint which completely fills joint and is free of porosity		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 18. FINISH AND POLISH RESTORATION

STS TASK REFERENCE(S):

4.7.9 Finish and polish restoration

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to finish and polish fixed restorations. Describe what the trainee should look for on the internal surface of the casting using a microscope. Stress the importance of margins, contacts, contours, and occlusion of the restorations. Have the trainee finish and polish fixed restorations and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Articulating Paper	Buffing Bar Compound (BBC)
Finishing and Polishing Burs, Points, and Wheels	Handpiece or Lathe
Heatless Stone	Indicating Medium
Microscope	Rouge
Separating Disk	Shimstock
Soap	Steam or Ultrasonic Cleaner

STEPS IN TASK PERFORMANCE:

1. Matte finish restorations using stones, avoiding previously adjusted areas
2. Rubber all restoration surfaces
3. Polish restorations using buffing bar compound (BBC) or equivalent, soft bristle brushes, and rag or felt wheel
4. Final polish restorations, using jewelers rouge, soft bristle brush, and rag or felt wheels
5. Clean restorations using steam or ultrasonic cleaner
6. Check proximal and occlusal contacts with shimstock
7. Check fit of casting to ensure accurate margins
8. Disinfect restoration

MODULE 18. FINISH AND POLISH RESTORATION

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to finish and polish fixed restorations and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FINISH AND POLISH RESTORATION		
DID THE TRAINEE...?	YES	NO
1. Finish and polish restorations to a high luster		
2. Maintain desired occlusal and proximal contacts		
3. Maintain margin integrity		
4. Clean and disinfect restorations		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 19. CUT BACK WAX PATTERN

STS TASK REFERENCE(S):

4.9.1 Cut back wax pattern

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to cut back wax pattern. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Die Lubricant	Bunsen Burner
Rubber Dam	Microscope
Wax Gauge	Wax Powder
Waxing Instruments	Inlay wax

STEPS IN TASK PERFORMANCE:

1. Wax-up prosthesis to full contour
2. Scribe cutback design on patterns using carving instrument
3. Measure thickness of wax patterns using wax gauge
4. Ensure full contour wax-up are at least 1.2 mm thick
5. Consult dentist if wax pattern is below minimum thickness
6. Make depth cuts in patterns using discoid instrument
7. Remove and smooth out wax from within design areas using carving instrument
8. Ensure all internal sharp angles or edges are removed
9. Ensure cutback areas measure at least 0.5 mm for castability, may be thinner depending on alloy used
10. Ensure finish lines are sharp at porcelain to metal junction
11. Remove wax patterns using rubber dam and apply die lubricant
12. Replace patterns on dies and refine margins
13. Use microscope to verify accuracy of margins
14. Clean patterns using preferred method

MODULE 19. CUT BACK WAX PATTERN

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to cut back wax pattern and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

CUT BACK WAX PATTERN		
DID THE TRAINEE...?	YES	NO
1. Inspect the casts and mounting to ensure adequate reduction		
2. Wax the pattern to full contour, establishing proper anatomic form and occlusion		
3. Design cutback of the wax patterns according to case requirements		
4. Carve patterns to correct cutback design without damaging pattern		
5. Reduce patterns to correct thickness in cutback area, providing adequate space for the porcelain veneer		
6. Eliminate all sharp angles in design area and smooth wax patterns		
7. Accurately refine margins of wax patterns		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 20. SPRUE AND INVEST METAL CERAMIC PATTERN

STS TASK REFERENCE(S):

4.9.2 Sprue and invest metal ceramic pattern

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to sprue and invest wax patterns using either the direct or indirect technique. Explain the significance of how proper sprue diameter and placement can decrease porosity in the casting. Estimate the amount of alloy needed for the casting based on the weight of the wax pattern and the specific gravity of the alloy. Describe the purpose of the orientation dot and show where it is placed on the sprue former. Have the trainee sprue and invest wax patterns and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Hose	Bunsen Burner
Casting Ring	Sprue Base
Debubblizer	Casting Ring Liner
Electronic Scale	Distilled Water
Inlay Wax	Graduated Cylinder
Millimeter Ruler	Investment
Small Artist Brush	Pen/Pencil
Sprue Former	Spatula
Sticky Wax	Sprue Wax
Vacuum Mixing Bowl	Vacuum Mixer
Waxing Instruments	Vibrator

STEPS IN TASK PERFORMANCE:

1. Inspect wax patterns on dies for suitability
2. Determine required size of sprue leads
3. Determine initial weight of sprue base using electronic scale before sprues are attached
4. Document weight of sprue base
5. Sticky-wax sprue leads to thickest part of patterns at 45° angle
6. Sticky-wax sprue leads to incisal edge of patterns for anterior units
7. Seal sprue leads to patterns using inlay wax

MODULE 20. SPRUE AND INVEST METAL CERAMIC PATTERN

STEPS IN TASK PERFORMANCE (CONTINUED):

8. Trim sprue lead lengths to approximately 6.0 mm for direct and 3.0 mm for indirect method
9. Remove patterns from dies
10. Sticky wax opposite end of sprue leads to sprue base
11. Position patterns outside of the thermal zone of the investment
12. Seal sprue leads to sprue base using inlay wax
13. Place sprue base assembly on electronic scale
14. Document weight of patterns and sprue base assembly
15. Compute difference of the two weights to determine weight of wax patterns
16. Determine the amount of alloy needed, for casting, by multiplying the wax pattern weight times the alloy's specific gravity
17. Secure ring liner 3.0 mm below edge of casting ring
18. Place orientation dot on sprue base
19. Place casting ring on sprue base
20. Apply debubbler to all surfaces of wax patterns and dry thoroughly
21. Vacuum mix investment IAW manufacturer's instructions
22. Paint on investment inside wax patterns using brush
23. Attach lined casting ring to sprue base
24. Fill casting ring with investment
25. Allow investment to set IAW manufacturer instructions

MODULE 20. SPRUE AND INVEST METAL CERAMIC PATTERN

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to sprue and invest metal ceramic pattern and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

SPRUE AND INVEST METAL CERAMIC PATTERN		
DID THE TRAINEE...?	YES	NO
1. Use the correct gauge and length of sprue		
2. Sprue to thickest part of the wax patterns		
3. Position patterns out of the thermal zone		
4. Secure liner in casting ring correctly		
5. Apply debubbler and dry thoroughly		
6. Mix the correct investment IAW manufacturer's direction		
7. Invest the pattern without creating voids		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 21. BURNOUT AND CAST SUBSTRUCTURE

STS TASK REFERENCE(S):

4.9.3 Burnout and cast substructure

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to burnout and cast substructure. Stress the need to balance the casting arm and ensure the mold is damp prior to burnout. Explain why separate crucibles are used for different types of alloys. Have the trainee burnout and cast substructures and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Divest and deoxidize castings without damage	Burnout Furnace
Casting Alloy	Casting Flux
Casting Machine	Casting Torch (Gas/Air, Gas/Oxygen)
Knife	Safety Goggles
Striker	Tongs

STEPS IN TASK PERFORMANCE:

1. Ensure burnout furnace is at room temperature
2. Ensure molds are moist prior to burnout
3. Remove glaze from top of investment
4. Balance casting arm, if necessary
5. Place casting rings in back and center of furnace with orientation dot to the right
6. Program furnace per manufacturer's instructions and ensure complete burnout
7. Ensure proper cradle is in place
8. Place appropriate crucible in machine
9. Wind broken-arm casting machine
10. Preheat crucible using furnace or torch
11. Ensure at least 50 percent new alloy is added to recycled alloy
12. Place alloy in crucible and melt using torch
13. Apply casting flux, if required
14. Remove casting ring from furnace and place in cradle
15. Release broken arm mechanism when metal reaches proper temperature
16. Remove casting ring after arm completely stops spinning

MODULE 21. BURNOUT AND CAST SUBSTRUCTURE

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to burnout and cast substructure and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

BURNOUT AND CAST SUBSTRUCTURE		
DID THE TRAINEE...?	YES	NO
1. Prepare mold for burnout and balance the casting machine		
2. Set and load the burnout furnace correctly		
3. Ensure molds were burned out completely		
4. Cast restorations with properly adjusted casting torch		
5. Adhere to all safety precautions while operating casting machine and torch		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 22. ADJUST METAL CERAMIC CASTING

STS TASK REFERENCE(S):

4.9.4 Adjust metal ceramic casting

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to adjust metal ceramic casting. Emphasize the importance of checking metal thickness frequently and using ceramic bound stones. Explain how contamination degrades the porcelain-to-metal bond. Emphasize the importance of harmonizing the occlusal relationship between restorations and natural dentition. Have the trainee adjust metal ceramic casting and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Articulating Paper	Ceramic Bound Stones
Finishing and Polishing Burs, Points, and Wheels	Handpiece or Lathe
Metal Gauge	Microscope
Separating Disk	Shimstock
Ultrasonic or steam cleaner	

STEPS IN TASK PERFORMANCE:

1. Desprue substructure using separating disk
2. Seat restorations on dies and cast
3. Verify margins are closed using microscope
4. Recontour sprue stump
5. Adjust proximal contacts using articulating paper, rubber wheels, and stones
6. Verify proximal contacts with shim stock
7. Finish axial surfaces with a stone; avoiding rubbered contacts
8. Adjust occlusion using articulating paper and stones
9. Verify occlusal contacts with shim stock
10. Adjust eccentric contacts
11. Remove any undesirable interferences using stones
12. Evaluate cutback design, ensuring proper porcelain placement
13. Measure metal thickness of porcelain-bearing areas
14. Reduce porcelain-bearing areas to minimum thickness, where required
15. Reduce width of metal collar to minimum
16. Sharpen finish lines

MODULE 22. ADJUST METAL CERAMIC CASTING

STEPS IN TASK PERFORMANCE (CONTINUED):

17. Produce satin finish on porcelain-bearing areas, in a single direction, using stones
18. Air abrade with aluminum oxide
19. Clean substructure

MODULE 22. ADJUST METAL CERAMIC CASTING

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to adjust metal ceramic casting and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

ADJUST METAL CERAMIC CASTING		
DID THE TRAINEE...?	YES	NO
1. Desprue and recontour sprue stump to proper contours		
2. Seat crown, maintaining marginal integrity		
3. Adjust proximal contacts on restorations until shimstock slightly drags		
4. Maintain proper emergence profile and height of contour		
5. Restore occlusion to original VDO and verify contacts using shimstock		
6. Reduce porcelain bearing surfaces to proper thickness (0.2-0.3 mm where required)		
7. Create a porcelain bearing surface free of sharp angles, holes, and contaminants		
8. Create a sharp porcelain-metal junction; without damaging substructure		
9. Clean substructures		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 23. FINISH AND PREPARE SUBSTRUCTURE FOR VENEERING

STS TASK REFERENCE(S):

4.9.5 Finish and prepare substructure for veneering

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to finish and prepare a substructure for veneering. Emphasize the importance of checking metal thickness frequently and using ceramic bound stones. Explain how contamination degrades the porcelain-to-metal bond. Emphasize the importance of harmonizing the occlusal relationship between restorations and natural dentition. Have the trainee finish metal-ceramic restorations and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Articulating Paper	Ceramic Bound Stones
Finishing and Polishing Burs, Points, and Wheels	Handpiece or Lathe
Metal Gauge	Microscope
Separating Disk	Shimstock
Ultrasonic or Steam Cleaner	

STEPS IN TASK PERFORMANCE:

1. Evaluate cutback design, ensuring proper porcelain placement
2. Measure metal thickness of porcelain-bearing areas
3. Reduce porcelain-bearing areas to minimum thickness, where required
4. Reduce width of metal collar to minimum
5. Sharpen finish lines
6. Produce satin finish on porcelain-bearing areas, in a single direction, using stones
7. Air abrade with aluminum oxide
8. Clean substructure

MODULE 23. FINISH AND PREPARE SUBSTRUCTURE FOR VENEERING

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to finish and prepare substructures and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FINISH AND PREPARE SUBSTRUCTURE FOR VENEERING		
DID THE TRAINEE...?	YES	NO
1. Create a porcelain bearing surface free of sharp angles, holes, and contaminants		
2. Create a sharp porcelain-metal junction; without damaging substructure		
3. Clean substructures		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 24. OXIDIZE PREPARED CASTING

STS TASK REFERENCE(S):

4.9.6 Oxidize prepared casting

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to oxidize a metal-ceramic substructure. Emphasize that each substructure alloy requires specific handling procedures. Have the trainee oxidize a substructure and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit
Hemostats
Porcelain Furnace
Sagger Tray
Steam or Ultrasonic Cleaner

STEPS IN TASK PERFORMANCE:

1. Hold substructure with hemostats
2. Air abrade substructure to remove contaminants
3. Clean substructure using steam or ultrasonic cleaner and let dry
4. Place substructure on sagger tray using hemostats
5. Place sagger tray on furnace firing tray/stand using tongs
6. Oxidize substructure IAW alloy manufacturer's instructions
7. Remove substructure from furnace using tongs
8. Remove excess surface oxides IAW alloy manufacturer's directions, if required

MODULE 24. OXIDIZE PREPARED CASTING

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to oxidize substructure and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

OXIDIZE PREPARED CASTING		
DID THE TRAINEE...?	YES	NO
1. Oxidize the substructure without distortion or damage		
2. Deoxidize substructure to a uniform layer IAW alloy manufacturer's directions		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 25. APPLY OPAQUE PORCELAIN

STS TASK REFERENCE(S):

4.9.7 Apply opaque porcelain

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to apply opaque porcelain to a metal-ceramic substructure. Emphasize that each substructure alloy requires specific handling procedures. Stress the importance of selecting porcelain that is compatible with the underlying substructure. Have the trainee opaque the substructure and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Facial Tissue	Distilled Water
Hemostats	Glass Slab or Rod
Opaque Modifiers	Opaque Liquid
Porcelain Furnace	Opaque Porcelain
Sagger Tray	Porcelain Instrument Kit
Sponge	Tongs

STEPS IN TASK PERFORMANCE:

1. Wet porcelain bearing surface of substructure with opaque liquid
2. Mix opaque liquid and opaque porcelain for washcoat application
3. Apply washcoat layer of opaque on porcelain bearing surface
4. Fire opaque in furnace IAW porcelain manufacture's directions
5. Remove substructure from furnace and let cool to room temperature
6. Mix opaque liquid and opaque porcelain to creamy consistency.
7. Apply second layer of opaque, using glass rod or porcelain brush
8. Cover all porcelain bearing surfaces leaving no metal shadows
9. Dry opaque and place substructure on sagger tray
10. Fire in furnace IAW porcelain manufacturer's directions
11. Remove substructure from furnace using tongs
12. Ensure there are no visible gray shadows
13. Repeat opaque application and firing, if required, to correct gray shadows
14. Apply opaque modifiers, if requested
15. Examine opaque for visible cracks/defects
16. Ensure opaque thickness does not exceed 0.2 mm
17. Ensure opaque has an eggshell-like surface texture

MODULE 25. APPLY OPAQUE PORCELAIN

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to apply opaque porcelain and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

APPLY OPAQUE PORCELAIN		
DID THE TRAINEE...?	YES	NO
1. Properly clean substructure prior to opaque application		
2. Apply opaque that uniformly masks metal without washing over finish line		
3. Attain an opaque layer free of visible cracks or defects with an eggshell-like surface		
4. Produce opaque layer that does not exceed 0.2 mm in thickness		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 26. APPLY SHOULDER PORCELAIN

STS TASK REFERENCE(S):

4.9.8 Apply shoulder porcelain

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to fabricate porcelain labial margins. Ensure the die has been properly prepared ready for porcelain application. Have the trainee fabricate porcelain labial margins and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Porcelain Brushes	Distilled Water
Wax Pencil (Red & Blue)	Glass Slab and Rod
Handpiece	Bench Lathe
Hemostats	Margin Porcelain
Microscope	Modeling Fluid
Porcelain Furnace	Porcelain Separator
Porcelain Instrument Kit	Porcelain Finishing Accessories
Sagger Tray	Tongs

STEPS IN TASK PERFORMANCE:

1. Apply porcelain separator to master die and seat substructures
2. Mix margin porcelain to paste-like consistency on glass slab
3. Apply margin porcelain to cervical area using porcelain brush
4. Condense porcelain by gently vibrating die; tap or serrate
5. Blot excess moisture from margin porcelain using facial tissue
6. Smooth porcelain towards margin using whipping brush
7. Remove excess moisture and overextensions
8. Press on substructure in a downward motion and remove with margin intact
9. Place substructure on sagger tray and fire IAW porcelain manufacturer's instructions
10. Remove substructure from furnace and let cool to room temperature
11. Using microscope, inspect inside of substructure for porcelain particles and remove them

MODULE 26. APPLY SHOULDER PORCELAIN

STEPS IN TASK PERFORMANCE (CONTINUED):

12. Mark facial margin on die using wax pencil and reapply porcelain separator
13. Replace substructure on die and repeat porcelain margin application procedure to correct discrepancies
14. Remove substructure from die with porcelain margin intact
15. Place substructure on sagger tray and fire IAW porcelain manufacturer's instructions
16. Remove substructure from furnace and let cool to room temperature
17. Finish porcelain margin using diamonds, stones, etc.

MODULE 26. APPLY SHOULDER PORCELAIN

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to fabricate porcelain labial margins and build porcelain to anatomical form. The trainee must satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

APPLY SHOULDER PORCELAIN		
DID THE TRAINEE...?	YES	NO
1. Verify the accuracy margins		
2. Apply separating medium to die before applying margin porcelain		
3. Fabricate an accurate porcelain margin		
4. Remove all porcelain particles from inside the restorations		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 27. APPLY DENTINE AND ENAMEL PORCELAIN

STS TASK REFERENCE(S):

4.9.9 Apply dentine and enamel porcelain

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how build porcelain to anatomical form. Ensure the die has been properly prepared ready for porcelain application. Stress the importance of having the dentine porcelain slightly moist to prevent entrapment of air bubbles between the dentine and enamel layers. Have the trainee build porcelain to anatomical form and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Porcelain Brushes	Distilled Water
Facial Tissue	Glass Slab and Rod
Handpiece	Bench Lathe
Hemostats	Tongs
Microscope	Modeling Fluid
Porcelain Furnace	Porcelain Separator
Porcelain Instrument Kit	Porcelain Finishing Accessories
Sagger Tray	Wax Pencil (Red & Blue)

STEPS IN TASK PERFORMANCE:

1. Mix dentine porcelain
2. Apply dentine porcelain in small increments to surface of restorations
3. Slightly overbuild contours of tooth with dentine porcelain
4. Condense porcelain buildup using facial tissue
5. Ensure porcelain buildup is kept moist throughout entire application procedure
6. Cutback dentine porcelain buildup for enamel porcelain
7. Moisten cutback area before adding enamel porcelain to ensure proper blend
8. Mix and apply enamel porcelain in small increments to cutback areas
9. Slightly overbuild contours of tooth with enamel porcelain
10. Blot restorations periodically with facial tissue and remove restorations from cast
11. Attach hemostats to restorations
12. Add dentine or enamel porcelain to interproximal contact areas, as needed
13. Condense porcelain buildup slightly by alternating vibration and tissue blotting
14. Place restorations on sagger tray and fire IAW porcelain manufacturer's instructions
15. Remove restorations from furnace and let cool to room temperature

MODULE 27. APPLY DENTINE AND ENAMEL PORCELAIN

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to fabricate porcelain labial margins and build porcelain to anatomical form. The trainee must satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

APPLY DENTINE AND ENAMEL PORCELAIN		
DID THE TRAINEE...?	YES	NO
1. Build dentine porcelain to proper contours and occlusion		
2. Cutback dentine buildup and apply enamel porcelain IAW with shade requested		
3. Add sufficient dentine and enamel porcelains to all contact areas to allow for shrinkage		
4. Dry buildup and fire porcelain to maturity		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 28. FIRE PORCELAIN BUILDUPS

STS TASK REFERENCE(S):

4.9.11 Fire porcelain buildups

TRAINING REFERENCE(S):

Manufacturer's directions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to fire porcelain restorations IAW manufacturer's directions. Stress the importance of drying the porcelain buildup prior to placing restoration in the furnace. Have the trainee fire porcelain restorations and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Hemostat	Porcelain
Porcelain furnace	Sagger Tray
Serrated Instrument	Tissue
Tongs	

STEPS IN TASK PERFORMANCE:

1. Ensure porcelain applications are complete
2. Inspect the underside of the metal framework and remove loose particles of porcelain
3. Carefully place the restoration on sagger tray
4. Properly place the restoration on firing table of the porcelain furnace
5. Ensure the correct firing program is entered for firing sequence
6. Allow the fired porcelain to cool before removing from firing table
7. Inspect the restoration to verify complete firing has occurred

MODULE 28. FIRE PORCELAIN BUILDUPS

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to fire porcelain buildups to achieve maturation. The trainee must satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FIRE PORCELAIN BUILDUPS		
DID THE TRAINEE...?	YES	NO
1. Remove any loose porcelain from the underside of the framework		
2. Place the restoration on the sagger tray, ensuring margins and pontic areas are not touching the tray		
3. Ensure that the correct program was used to fire the porcelain		
4. Allow the restoration to cool before removing from the firing tray		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 29. CONTOUR FIRED PORCELAIN

STS TASK REFERENCE(S):

4.9.12 Contour fired porcelain

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to contour fired porcelain. Stress the importance of inspecting the internal surfaces of the crown for sintered porcelain particles. Ensure the trainee follows the line angles and characterization of the patient's natural dentition when contouring restorations. Have the trainee contour fired porcelain and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit	Articulating Paper
Ceramic Bound Stones	Diamond Burs
Diamond Wheels	Disclosing Medium
Disks	Handpiece
Metal Gauge	Microscope
Shimstock	Wax Pencil (Red and Blue)

STEPS IN TASK PERFORMANCE:

1. Verify fit of restorations on dies
2. Adjust proximal and ridge contacts of restorations using articulating paper
3. Ensure restorations seat on a solid cast and verify contacts using shimstock
4. Adjust centric and eccentric occlusal contacts to desired occlusal scheme
5. Reduce bulk to establish overall contour, i.e., length, width, and thickness
6. Adjust length to harmonize with both centric and eccentric contacts
7. Contour facial surface, frequently checking the thickness of the veneer
8. Shape the interproximal of FPDs, using ultrathin discs, to produce natural embrasures
9. Contour proximal surfaces to shape embrasures and imitate contours of teeth on the contralateral side
10. Check facial profile and alignment of teeth
11. Mark line angles of restorations and natural dentition to use as guides in contouring
12. Contour veneer surfaces so all line angles match teeth on the contralateral side
13. Carve anatomy, i.e., developmental grooves and secondary anatomy
14. Carve surface detail and texture veneer to match adjacent teeth

MODULE 29. CONTOUR FIRED PORCELAIN

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to demonstrate how to contour fired porcelain, reproducing the patient's existing natural dentition. The trainee must satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

CONTOUR FIRED PORCELAIN		
DID THE TRAINEE...?	YES	NO
1. Correctly seat the fired restorations without damaging the die		
2. Adjust proximal, occlusal, and ridge contacts and verify using shimstock		
3. Adjust lengths to prescribed centric and eccentric occlusion		
4. Develop facial, lingual, proximal, and emergence profile contours to compliment natural dentition		
5. Contour restorations to harmonize with existing natural dentition		
6. Create surface texture to match adjacent natural dentition		

FEEDBACK:

The trainee must be able to contour a porcelain fused to metal fixed partial denture. Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 30. SURFACE STAIN AND COLOR CORRECT VENEER

STS TASK REFERENCE(S):

4.9.13 Surface stain and color correct veneer

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to surface stain and color correct a veneer. Explain how the color wheel applies to staining when small adjustments are needed to produce the correct shade. Have the trainee surface stain and color correct a veneer and suggest ways to improve performance. Explain how the final surface texture appearance is influenced by both firing time and temperature. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit	Disinfectant Solution
Hemostats	Porcelain Furnace
Porcelain Staining Medium	Sagger Tray
Shade Guide	Small Artist Brushes
Staining Kit	Staining Liquid
Staining Palate	Steam or Ultrasonic Cleaner
Water	Tongs

STEPS IN TASK PERFORMANCE:

1. If a try-in was accomplished, disinfect restorations before staining
2. Break glazed porcelain surface using air abrasive unit
3. Accentuate surface texture to offset application of stain
4. Clean restorations using steam or ultrasonic cleaner
5. Mix stain with appropriate staining liquid to a thin, fluid consistency
6. Hold restorations with hemostat and apply stain with small artist brush
7. Verify that the color matches the requested shade
8. Dry restorations under warm muffle
9. Remove excess stain from metal areas
10. Place restorations on sagger tray and fire IAW porcelain manufacturer's instructions
11. Remove sagger tray from furnace and bench cool restorations
12. Inspect restorations for desired color match
13. If color match is not achieved, reaccomplish complete procedure

MODULE 30. SURFACE STAIN AND COLOR CORRECT VENEER

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to accurately match the patients natural tooth color by applying stain to the surface of the porcelain. The trainee must satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

SURFACE STAIN AND COLOR CORRECT VENEER		
DID THE TRAINEE...?	YES	NO
1. Disinfect the restoration, if necessary, prior to applying the stain		
2. Properly prepare and clean the porcelain surface		
3. Achieve correct match using stains provided in the stain kit		
4. Allow the stain medium to completely dry before placing it in the furnace		
5. Verify that the correct program was used to fire the porcelain		
6. Achieve desired color match,		

FEEDBACK:

The trainee must be able to apply stain to a porcelain fused to metal crown producing a match with the patient's natural dentition. The trainee must also be able to understand the firing procedures required to ensure complete maturation has occurred. Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 31. GLAZE PORCELAIN RESTORATION

STS TASK REFERENCE(S):

4.9.14 Glaze porcelain restoration

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to glaze porcelain restorations. Have the trainee glaze a porcelain restoration and suggest ways to improve performance. Explain how the final surface texture appearance is influenced by both firing time and temperature. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit	Disinfectant Solution
Hemostats	Porcelain Furnace
Porcelain Staining Medium	Sagger Tray
Shade Guide	Small Artist Brushes
Staining Kit	Staining Liquid
Staining Palate	Steam or Ultrasonic Cleaner
Water	Tongs

STEPS IN TASK PERFORMANCE:

1. If a try-in was accomplished, disinfect restorations before glazing
2. Break glazed porcelain surface using air abrasive unit
3. Accentuate surface texture to offset application of glaze
4. Clean restorations using steam or ultrasonic cleaner
5. Apply glaze evenly
6. Place on sagger tray and place on muffle of oven
7. Select appropriate program

MODULE 31. GLAZE PORCELAIN RESTORATION

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to glaze porcelain restoration and satisfactorily perform all tasks without assistance. Evaluate the trainee's performance using this checklist.

GLAZE PORCELAIN RESTORATION		
DID TRAINEE...?	YES	NO
1. Disinfect the restoration, if necessary, prior to applying the glaze		
2. Properly prepare and clean the porcelain surface		
3. Verify that the correct program was used to fire the porcelain		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 32. FABRICATE METAL-CERAMIC FIXED PARTIAL DENTURE

STS TASK REFERENCE(S):

4.10.1 Fabricate metal-ceramic fixed partial denture

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's Instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate waxing the restoration to full contour. Stress proper anatomic form and occlusal contacts. Ensure trainee understands and follows appropriate manufacturer's directions. Have the trainee fabricate metal-ceramic fixed partial dentures and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit	Articulator
Alloy	Electronic Scale
Assorted Burs/Stones	Bunsen Burner
Burnout Furnace	Casting Investment
Casting Rings	Dental Instruments
Dental Porcelain	Die Spacer/Hardener
Assorted Points and Wheels	Gas/Oxygen Torch
Handpiece	Debubbler
Inlay Wax	Metal Gauge
Microscope	Polishing Compound
Porcelain Furnace	Separating Medium
Ring liner	Rubber Dam
Soft Bristle Brushes	Sprue Base
Sprue Wax	Vibrator
Wax Gauge	Wax Powder

STEPS IN TASK PERFORMANCE:

1. Inspect die preparation for undercuts and adequate reduction
2. Blockout undercuts, mark margins, and apply die hardener/spacer
3. Apply separating medium to die and adjacent/opposing teeth
4. Apply hot inlay wax to die to form coping
5. Remove wax pattern and inspect internal surface for voids
6. Replace wax pattern on die and reseal with inlay wax
7. Place wax pattern on cast and reduce any occlusal interferences
8. Apply wax to form lower 2/3 tooth contour of abutments and pontic

MODULE 32. FABRICATE METAL-CERAMIC FIXED PARTIAL DENTURE

STEPS IN TASK PERFORMANCE (CONTINUED):

9. Wax occlusal morphology
10. Apply wax powder to occlusal of pattern and check for prescribed occlusal contacts
11. Apply inlay wax to fill in deficient contours, smooth and refine entire pattern
12. Draw cutback design on pattern using carving instrument
13. Cutback porcelain bearing areas
14. Apply wax to margins and refine marginal adaptation using microscope
15. Determine required size of sprue leads
16. Construct runner bar assembly using sprue wax or preformed patterns
17. Sticky-wax sprue leads to the pattern at 45-degree angle
18. Seal sprue leads to runner bar using inlay wax
19. Sticky-wax feeder sprue leads to sprue base
20. Seal sprue leads to sprue base using inlay wax
21. Remove pattern from die and weigh
22. Invest, burnout and cast the pattern
23. Desprue substructure and seat substructure on removable dies
24. Finish the substructure
25. Hold substructure with hemostats and blast in air abrasive unit
26. Remove residue using steam or ultrasonic cleaner
27. Place substructure on sagger tray and fire substructure IAW alloy manufacturer's instructions
28. Repeat air abrasive unit and cleaning, if required by manufacturer
29. Apply and fire opaque porcelain
30. Apply and fire dentine and enamel porcelain
31. Contour the fired restoration
32. Reapply, fire and contour porcelain correction
33. Apply stains and glaze the restoration
34. Polish the non-porcelain bearing surfaces
35. Clean and disinfect the finished restoration

MODULE 32. FABRICATING METAL-CERAMIC FIXED PARTIAL DENTURES

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to fabricate metal-ceramic fixed partial dentures and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FABRICATING METAL-CERAMIC FIXED PARTIAL DENTURES		
DID THE TRAINEE...?	YES	NO
1. Inspect the casts and mounting to ensure adequate reduction		
2. Wax the pattern to full contour, establishing proper anatomic form and occlusion		
3. Cut back the wax-up, providing adequate space for the porcelain veneer		
4. Sprue the wax pattern using the indirect technique		
5. Invest, burnout and cast the substructure IAW manufacturer's directions		
6. Recover and finish the substructure to a satin finish on the porcelain bearing areas		
7. Oxidize the substructure IAW alloy manufacturer's instructions		
8. Apply and fire opaque porcelain, ensuring complete coverage of the underlying metal		
9. Apply dentine and enamel porcelain to anatomic form and fire IAW manufacturer's directions		
10. Contour the fired porcelain, reproducing the anatomic features of the surrounding dentition		
11. Color correct restoration to match prescribed shade and fire to a glaze		
12. Polish the non-porcelain bearing surfaces to a high luster		
13. Clean and disinfect the restoration		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 33. PRESOLDER SUBSTRUCTURE

STS TASK REFERENCE(S):

4.10.2 Presolder substructure

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to presolder metal-ceramic substructures. Have the trainee presolder metal-ceramic substructures and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit	Burs
Ceramic Bound Stones	Furnace or Oven
Hemostats	Oxygen Torch with Soldering Tip
Solder	Soldering Stand
Steam or Ultrasonic Cleaner	Striker
Tongs	

STEPS IN TASK PERFORMANCE:

1. Place invested assembly in cold furnace and raise to 1300° F and heat soak for 5 to 10 minutes
2. Ensure the torch has a special soldering tip
3. Adjust the flame until the inner cone is about 15 mm long, there should be little or no hissing
4. Remove assembly from oven and place on soldering stand
5. Immediately apply flame to base of investment, evenly heating entire assembly
6. Apply flame to the castings and heat until they show a slight orange color
7. Maintain the torch tip in the localized solder joint
8. Place the end of the solder strip onto the solder joint area
9. Ensure the solder melts and flows down into the joint area
10. Remove the solder strip, but keep the flame on the assembly
11. Move the flame to the reverse side and draw the solder through the joint
12. Let the investment and substructure bench cool to room temperature
13. Divest and clean substructure using air abrasive unit
14. Grind solder area to desired contour using stones
15. Fit substructure on cast and adjust occlusion

MODULE 33. PRESOLDER SUBSTRUCTURE

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

PRESOLDER SUBSTRUCTURE		
DID THE TRAINEE...?	YES	NO
1. Burnout the investment assembly using correct time and temperature		
2. Adjust the soldering torch and heat the investment patty evenly		
3. Accurately produce a solder joint which completely fills the joint area and is free of porosity		
4. Divest without abrading or damaging substructure		
5. Finish solder area to desired contour		
6. Verify fit of substructure on cast		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 34. FABRICATE SURVEYED CROWN

STS TASK REFERENCE(S):

4.11 Fabricate surveyed crown

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to fabricate a surveyed crown. Ensure you have a tripoded design cast prior to waxing the pattern or have the dentist establish the survey table tilt. Ensure trainee understands and follows appropriate manufacturer's directions. Have the trainee fabricate a surveyed crown and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit	Articulator
Bunsen Burner	Burnout Furnace
Casting Rings	Dental Instruments
Dental Surveyor	Die Hardener/Spacer
Burs, Points, and Wheels	Casting Torch
Handpiece	Investment
Inlay Wax	Polishing Compound
Microscope	Separating Medium
Rubber Dam	Sprue Base
Soft Bristle Brushes	Survey Table w/Instruments
Sprue Wax	Vibrator
Undercut Gauge	Wax Powder
Wax Pencil (Red & Blue)	

MODULE 34. FABRICATE SURVEYED CROWN

STEPS IN TASK PERFORMANCE:

1. Inspect die preparation for undercuts or distorted areas
2. Block out any undercuts, mark margins and apply die hardener/spacer
3. Check bite for adequate reduction
4. Apply separating medium to pattern area and opposing teeth
5. Apply hot inlay wax to die to form coping
6. Remove wax pattern and inspect internal surface for voids
7. Replace wax pattern on die and reseal with inlay wax
8. Place wax pattern on articulator and reduce any occlusal interferences
9. Apply wax to form lower 2/3 tooth contour of abutments and pontic
10. See training references for specific anatomic and functional contouring
11. Apply wax powder to occlusal of pattern and check for prescribed contact pattern
12. Apply inlay wax to fill in deficient contours, smooth and refine entire pattern
13. Remove master cast and position on survey table
14. Adjust survey table to prescribed tilt using tripod marks
15. Lock table in place to maintain established tilt
16. Use undercut gauge to determine the location of the desired undercut, per the dentist's instructions
17. Carve guide planes at required locations
18. Adjust contours to ensure survey lines are compatible with proposed clasp assemblies
19. Carve rests in prescribed locations
20. Smooth and refine entire pattern
21. Sprue, invest, burnout and cast
22. Finish and polish the restoration ensuring all previously established features are unaltered
23. Clean and disinfect the finished restoration

MODULE 34. FABRICATE SURVEYED CROWN

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to fabricate a surveyed crown and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FABRICATE SURVEYED CROWN		
DID THE TRAINEE...?	YES	NO
1. Inspect the casts and mounting to ensure adequate reduction		
2. Wax pattern to full contour, establishing proper anatomic form and occlusion		
3. Place the cast on survey table, establishing the prescribed path of insertion		
4. Establish survey lines and retentive undercuts in appropriate locations for proposed clasp assemblies		
5. Place guide planes and rests in prescribed locations		
6. Sprue, invest, burnout and cast IAW manufacturer's directions		
7. Finish and polish the restoration without altering the previously established axial contours		
8. Clean and disinfect the finished restoration		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 35. FABRICATE FIXED RESTORATIONS USING NON-RIGID CONNECTORS

STS TASK REFERENCE(S):

4.12 Fabricate fixed restorations using non-rigid connectors

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
Manufacturer's instructions
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to fabricate fixed restorations using non-rigid connectors. Explain purpose of non-rigid connectors. Elaborate how and why each type of connector is used. Stress caution when investing the attachment pattern to avoid trapping air. Have the trainee fabricate fixed partial dentures with non-rigid connectors and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit	Articulator
Bunsen Burner	Burnout Furnace
Casting Rings	Dental Instruments
Dental Surveyor	Die Hardener/Spacer
Burs, Points, and Wheels	Casting Torch
Inlay Wax	Investment
Microscope	Polishing Compound
Plastic Non-Rigid connector patterns	Handpiece
Rubber Dam	Separating Medium
Soft Bristle Brushes	Sprue Base
Sprue Wax	Survey Table W/Instruments
Undercut Gauge	Vibrator
Wax Pencil (Red & Blue)	Wax Powder

MODULE 35. FABRICATE FIXED RESTORATIONS USING NON-RIGID CONNECTORS

STEPS IN TASK PERFORMANCE:

1. Inspect master cast and removable die for accuracy
2. Wax fixed partial denture pattern
3. Cut recess in distal wall of anterior abutment of wax-up to accommodate female attachment
4. Place cast on survey table and adjust tilt to place attachment parallel with distal abutment using surveyor
5. Use surveyor, with male connector attached, to wax female attachment into recessed area of wax pattern
6. Fill recess area around attachment with inlay wax
7. Recontour restoration using preferred dental instrument
8. Sprue, invest, burnout and cast pattern
9. Recover and seat casting on die using microscope
10. Adjust proximal contact using articulating paper, stones and rubber wheels
11. Cut recess in mesial wall of pontic to accommodate male attachment using waxing instrument
12. Position male attachment into female attachment and sticky wax to distal retainer
13. Smooth area around male attachment with inlay wax
14. Recontour restoration using preferred dental instrument
15. Sprue, invest, burnout and cast pattern
16. Seat recovered casting on die using microscope
17. Adjust proximal contacts using articulating paper, stones and rubber wheels
18. Seat male attachment to female attachment
19. Finish and polish the castings
20. Clean and disinfect finished restoration

MODULE 35. FABRICATE FIXED RESTORATIONS USING NON-RIGID CONNECTORS

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to fabricate fixed restorations using non-rigid connectors and satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FABRICATE FIXED RESTORATIONS USING NON-RIGID CONNECTORS		
DID THE TRAINEE...?	YES	NO
1. Inspect the cast and die for accuracy, and properly prepare die for waxing		
2. Wax the FPD to full contour, ensuring proper contours and occlusion		
3. Place the female portion of the attachment in the distal wall of the mesial retainer, ensuring the path of insertion matched the distal retainer		
4. Invest and cast the pattern without trapping air in the attachment		
5. Accurately seat the mesial retainer on the die		
6. Place male attachment in female attachment and complete distal wax-up		
7. Invest and cast the pattern without trapping air in the attachment		
8. Accurately seat casting, ensuring non-frictional seating of the attachment		
9. Finish and polish the FPD without damaging the attachments		
10. Clean and disinfect the completed FPD		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

MODULE 36. FABRICATE RESIN-BONDED FIXED PARTIAL DENTURE

STS TASK REFERENCE(S):

4.13 Fabricate resin-bonded fixed partial denture

TRAINING REFERENCE(S):

AFP 47-103, Vol. 2, *Dental Laboratory Technology*
4Y052 CDC

EVALUATION INSTRUCTIONS:

Demonstrate how to fabricate resin-bonded fixed partial dentures. Stress the importance of reestablishing marginal integrity before beginning spruing and investing procedures. Ensure the mold has completely cooled before handling. Stress that care be taken when seating the casting so as not to damage the cast. Ensure adequate clearance for porcelain is achieved by checking the restoration on the mounting. Ensure the restoration is disinfected before the provider receives it for a bisque bake try-in. Place the restoration in a labeled plastic bag, identifying the restoration as etched. Have the trainee fabricate resin-bonded fixed partial dentures and suggest ways to improve performance. After ensuring the trainee has received sufficient practice, evaluate his/her abilities using the performance checklist.

PERFORMANCE RESOURCES:

Air Abrasive Unit	Articulator
Bunsen Burner	Burnout Furnace
Cast Trimmer	Casting Alloy
Casting Rings	Casting Torch
Debubbler	Preweighed Dental Stone
Die Hardener/Spacer	Etching Solution
Burs, Points, and Wheels	Handpiece
Inlay Wax	Investment
Microscope	Polishing Compound
Porcelains	Rubber Dam
Separating Medium	Soft Bristle Brushes
Spatula	Sprue Base
Sprue Wax	Tongs
Vacuum Mixer	Vacuum Mixing Bowl
Vibrator	Wax Pencil (Red & Blue)
Wax Powder	Waxing and Carving Instruments

MODULE 36. FABRICATE RESIN-BONDED FIXED PARTIAL DENTURE

STEPS IN TASK PERFORMANCE:

1. Fabricate a fixed master cast
2. Verify the accuracy of the mounting
3. Mark margins on master cast using wax pencil
4. Apply separating medium to the cast
5. Soften inlay wax and fill in margin areas
6. Wax up pontic and retentive wings to full contour
7. Remove the wax up from the preparation to verify path of insertion
8. Check the underside of the retentive wings for worm trails
9. Reseal the pattern to the cast and perform cut back procedures
10. Check occlusal clearance between the pontic and opposing teeth for adequate reduction
11. Perform final wax up to re-establish the marginal integrity
12. Sprue the pattern to ensure even flow of the molten metal
13. Invest the pattern in high heat investment without ring liner
14. Burnout and cast the pattern
15. Recover and de-sprue the casting
16. Check the casting for irregularities
17. Seat the casting on the master cast
18. Prepare the casting to receive porcelain
19. Deoxidize the casting
20. Blast the framework to remove excess oxides
21. Apply opaque porcelain with modifiers if used and fire
22. Apply dentine and enamel porcelains and fire
23. Contour fired porcelain to desired outcome
24. Return restoration to provider for initial try-in (if requested)
25. Prepare the porcelain for staining and glazing procedures
26. Apply stain and glaze medium (if necessary) and fire
27. Finish and polish the restoration
28. Prepare the restoration for etching procedures
29. Apply etching solution IAW manufacturer's directions
30. Place the etched appliance in a plastic bag with appropriate identification

MODULE 36. FABRICATE RESIN-BONDED FIXED PARTIAL DENTURE

PERFORMANCE CHECKLIST

INSTRUCTIONS:

The trainee must be able to accurately fabricate a resin bonded fixed partial denture. The trainee must satisfactorily perform all parts of the task without assistance. Ensure proper safety precautions are followed. Evaluate the trainee's performance using this checklist.

FABRICATE RESIN-BONDED FIXED PARTIAL DENTURE		
DID THE TRAINEE...?	YES	NO
1. Verify the accuracy of the working cast, ensuring adequate reduction and marginal integrity		
2. Wax up substructure ensuring proper design for porcelain application and accurate marginal adaptation		
3. Sprue, invest, burnout, and cast IAW manufacturer's directions		
4. Recover and seat the casting on the working cast without causing damage		
5. Finish and deoxidize the casting to prepare for porcelain application		
6. Apply opaque dentine and enamel porcelains to framework and fire IAW manufacturer's directions		
7. Contour the fired porcelain, achieving anatomical contours and proper occlusion		
8. Disinfect the restoration and return it to the provider if requested		
9. Apply and fire stain and glaze to match the patients natural dentition		
10. Finish and polish the restoration		
11. Etch the restoration IAW manufacturer's directions and place it in clean plastic bag		

FEEDBACK:

Using this checklist as a source of information, discuss the trainee's performance indicating strengths and weaknesses, suggested improvements, etc. If the trainee performed all steps of the task satisfactorily, both the trainer and trainee should certify performance by appropriately documenting the OJT record.

Dental Laboratory Qualification Training Progress Record

Rank/Name _____

(Circle One)

Qualification Upgrade Training to: **5-Skill Level** 7-Skill Level

Volume 2. Fixed Prosthodontics				
<i>Core Task</i>	<i>Module Number</i>	<i>Module Title</i>	<i>Date Completed</i>	<i>Trainer's Initials</i>
5	1.	Fabricate Post and Core		
5	2.	Prepare Dies for Waxing		
5	3.	Wax Patterns (Single Metal)		
5	4.	Sprue and Invest Wax Pattern (Single Metal)		
5	5.	Burnout and Cast Restoration (Single Metal)		
5	6.	Divest Casting (Single Metal)		
5	7.	Adjust Casting		
5	8.	Solder Crown		
5	9.	Finish and Polish Restoration		
5	10.	Prepare Dies for Waxing		
5	11.	Wax Pattern (FPD)		
5	12.	Sprue and Invest Wax Pattern (FPD)		
5	13.	Burnout and Cast Restoration (FPD)		
5	14.	Divest Casting (FPD)		
5	15.	Adjust Casting (FPD)		
5	16.	Solder Crown		
5	17.	Solder Fixed Partial Denture		
5	18.	Finish and Polish Restoration		
5	19.	Cut Back Wax Pattern		
5	20.	Sprue and Invest Metal Ceramic Pattern		
5	21.	Burnout and Cast Substructure		
5	22.	Adjust Metal Ceramic Casting		
5	23.	Finish and Prepare Substructure for Veneering		
5	24.	Oxidize Prepared Casting		
5	25.	Apply Opaque Porcelain		
5	26.	Apply Shoulder Porcelain		
5	27.	Apply Dentine and Enamel Porcelain		

Volume 2. Fixed Prosthodontics				
5	28.	Fire Porcelain Buildups		
5	29.	Contour Fired Porcelain		
5	30.	Surface Stain and Color Correct Veneer		
5	31.	Glaze Porcelain Restoration		
7	32.	Fabricate Metal-Ceramic Fixed Partial Denture		
7	33.	Presolder Substructure		
7	34.	Fabricate Surveyed Crown		
7	35.	Fabricate Fixed Restoration Using Non-Rigid Connectors		
7	36.	Fabricate Resin-Bonded Fixed Partial Denture		

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MEMORANDUM FOR 381 TRS/XWAA (CDC Writer)
917 Missile Rd
Sheppard AFB TX 76311-2246

FROM:

SUBJECT: Qualification Training Package Improvement

1. Identify volume and module.

Volume # _____

Module # and title _____

2. Identify improvement/correction section(s)

_____ STS Task reference	_____ Performance Checklist
_____ Training Reference	_____ Feedback
_____ Evaluation Instructions	_____ Format
_____ Performance Resources	_____ Other
_____ Steps in Task Performance	

3. Recommended changes--use a continuation sheet if necessary.

4. Thank you for your time and interest.

YOUR NAME, RANK, USAF
Title/Position