July 2005

Laboratory Manual

Preclinical • Clinical

THE UNIVERSITY *of* TEXAS
DENTAL BRANCH AT HOUSTON
A part of The University of Texas Health Science Center at Houston

Table of Contents

I. GENERAL INFORMATION

This manual provides students with important safety and infection control information for working in the preclinical and clinical laboratories. Students will spend much of the first two years in preclinical education in the Preclinical Laboratory, located in Room B-54 (basement). In the third and fourth years, students will primarily be involved in patient care and will utilize the Clinical Laboratory, located in Room 241 (second floor). All students are expected to follow all policies and procedures described in this manual when working in labs.

A. Hours of Operation

The Preclinical Laboratory (B-54) and Clinical Laboratory (Rooms 241) operate as follows:

Monday-Thursday	7:00 am – 10:00 pm
Friday	7:00 am – 7:00 pm
Saturday	9:00 am – 5:00 pm
Sunday	12 Noon – 5:00 pm
Holidays	Closed

Third- and fourth-year dental students are to use the Clinical Laboratory for all laboratory procedures. However, students may use unassigned workspace in the Preclinical Lab (B-54) if space is not available in the second floor Clinical Laboratory. Students should check with lab dispensary personnel during regular hours regarding availability of workspace.

B. Student User Responsibilities

Students are individually responsible for maintaining the laboratory areas as listed below. Failure to do so will result in referral to the Dental Branch Disciplinary Officer.

1. All students must adhere to safety and infection control regulations regarding handling casts, impressions, and other contaminated items.
2. All students using the laboratories after hours must wear their UT identification badge and sign-in/sign-out when entering or leaving the laboratories.
3. The clinical dress code described in this manual and in Section 1.31 of the Clinic Manual applies to the laboratories.
4. Personal equipment and instruments should not be left in the laboratories. The Dental Branch is not responsible for loss of personal items stored or left in the laboratories.
5. All students are expected to conduct themselves in a professional manner at all times.
6. The laboratories must be kept clean and neat at all times. This includes benches, model trimmers, and casting areas, polishing and finishing benches. Dental stone must be properly discarded after completion of work. Dental stone and casting materials are not to be discarded in the sink as this may cause severe plumbing problems. Please discard all casting materials in the waste receptacles.
7. All equipment and supplies provided for student use in the laboratories are the property of the Dental Branch and must remain in the laboratories.
8. Only laboratory work for Dental Branch preclinical courses or patient care is authorized to be performed in the labs.

II. PRECLINICAL LABORATORY

The following policy and procedures apply to the proper care and use of the Preclinical Laboratory (Room B-54):

A. Safety

1. Appropriate safety attire must be worn when working in the preclinical laboratory. This may include one or more of the following:

    - Apron or gown
    - Eye protection (e.g., safety glasses with side shields; face shield)
    - Mask

2. Long hair must be put-up and back to prevent it from being caught in machinery.

3. When using a polishing lathe, the safety shield must be down and in place, or a face shield worn, with the suction turned on. Do not attempt to stop a lathe by grasping the attachment with hands. Do not use latex gloves with the lathe: they do not break away and allow the operator to take his/her hand from the machine. Do not make any adjustments or replace chucks, wheels, etc., when lathes are running. **FAILURE TO PROTECT HANDS OR WEARING LATEX GLOVES MAY RESULT IN SERIOUS INJURY!**

4. Do not inhale acrylic resin monomers or any health hazardous solvent. Work with good ventilation or use chemical protection. A charcoal filter is recommended when using monomer or any other health hazardous solvent. The filters are for fumes and must not be used for suction of debris, such as stone, resin, etc.

5. Keep hands clean. Wash hands after contacting any chemical agent, body fluids, and before leaving the laboratory.

6. Do not allow an open flame within ten inches of inflammable material (e.g., acrylic resin, monomer acetone, etc.)

7. If a material ignites, turn off the gas jets immediately. Fire extinguishers and fire blankets are available in the laboratory. The red fire blanket boxes open by pulling the handle out and down. Completely cover the burning item with the blanket. The object is to deprive the fire of the oxygen that supports its combustion. Remove the blanket after the flames are out.

    In case clothing catches fire, drop to the floor and roll from side to side. All personnel should recognize that, if another person's clothing catches fire, push the person to the floor and roll him to smother the flames. Rolling on the floor not only smothers the fire, but also helps keep the flames away from the victim's face and reduces smoke inhalation. There are ABC and CO_2 type fire extinguishers in each laboratory. The ABC extinguisher is used for ordinary combustible items such as wood, cloth, paper, and flammable liquids such as grease, gasoline, paint, and electrical equipment or wiring. The CO_2 extinguisher is used for electrical or grease fires. To operate the extinguisher, pull the pin, then aim the nozzle, squeeze the trigger on the handle and sweep the nozzle from side to side at the base of the fire. If using the CO_2 extinguisher be sure to hold it by the handle. The gas coming out of the cone nozzle is very cold and skin will adhere to the nozzle.

    For further information on fire safety and prevention refer to UTHSCH Emergency Situation Response Plan (http://www.uth.tmc.edu/safety/).

8. Minimize use of flammable and combustible materials in the laboratory.

9. Shut off all gas/air valves at the end of each laboratory period. Turn off all Bunsen burners and alcohol torches when they are not being used.
10. Spill clean up is everyone's responsibility. Broken glass is to be picked up with forceps, mechanical means, or a broom and dustpan, **not with fingers**.
11. All users should use proper postural positions when working in the laboratory. Take periodic breaks from working in order to avoid fatigue.
12. All accidents should be reported immediately to faculty or laboratory technician. If faculty member or lab technician is not immediately available, the Director of Clinical Services should be notified at ext. 4008. After hours and on Saturday, personal physician or an emergency room should be consulted for any care that is needed.
13. Do not blow dust off cast/prosthesis with breath. Remove dust by using laboratory air supply.
14. Sharps containers are in each laboratory. Used blades, pins, broken glass or other like items must be placed in a sharps container.

B. Infection Control

1. Wash hands after handling equipment, removing gloves, after contact with body fluids, and before leaving the laboratory.
2. No eating or drinking, handling contacts or applying cosmetics is allowed in the laboratory area.
3. All appropriate personal protective equipment must be worn when working in the laboratory.

C. Attire

Students working in the Preclinical Laboratory are expected to follow Dental Branch guidelines for personal attire as outlined in the *Student Guide to Academic Affairs* during regular school hours:

> *"Students are expected to maintain a professional personal appearance. During operating hours, students are prohibited from wearing shorts. Men's shirts must have sleeves and women are prohibited from wearing tank tops or halters. Baseball caps, jeans, and T-shirts are not considered appropriate attire in classes, preclinical laboratories, or clinics. These personal appearance standards are in effect from 7:00 am to 6:00 pm Monday through Friday. Students who are not in compliance with these minimal dress requirements will not be allowed to remain in the building."*

III. CLINICAL LABORATORY

A. Safety

1. Appropriate safety attire must be worn when working in the clinical laboratory. This may include one or more of the following:
    - Apron or gown
    - Eye protection (e.g., safety glasses with side shields; face shield)
    - Mask
2. Long hair must be put-up and back to prevent it from being caught in the machinery.

3. When using a polishing lathe, the safety shield must be down and in place, or a face shield worn, with the suction turned on. Do not attempt to stop a lathe by grasping the attachment with hands. Do not use latex gloves with the lathe: they do not break away and allow the operator to take his/her hand from the machine. Do not make any adjustments or replace chucks, wheels, etc., when lathes are running. **FAILURE TO PROTECT HANDS OR WEARING LATEX GLOVES MAY RESULT IN SERIOUS INJURY!**

4. Do not inhale acrylic resin monomers or any health hazardous solvent. Work with good ventilation or use a chemical protected mask.

5. Keep hands clean. Wash hands after contacting any chemical agent, body fluids, and before leaving the laboratory.

6. Do not allow an open flame within ten inches of inflammable material (e.g., acrylic resin, monomer acetone, etc.)

7. If a material ignites, turn off the gas jets immediately. Fire extinguishers and fire blankets are available in the laboratory. The red fire blanket boxes open by pulling the handle out and down. Completely cover the burning item with the blanket. The object is to deprive the fire of the oxygen that supports its combustion. Remove the blanket after the flames are out.

   In case clothing catches fire, immediately drop to the floor and roll from side to side. All personnel should recognize that, if another person's clothing catches fire, push the person to the floor and roll him to smother the flames. Rolling on the floor not only smothers the fire, but also helps keep the flames away from the victim's face and reduces smoke inhalation. There are ABC and CO_2 type fire extinguishers in each laboratory. The ABC extinguisher is used for ordinary combustible items such as wood, cloth, paper, and flammable liquids such as grease, gasoline, paint, and electrical equipment or wiring. The CO_2 extinguisher is used for electrical or grease fires. To operate the extinguisher, pull the pin, then aim the nozzle, squeeze the trigger on the handle and sweep the nozzle from side to side at the base of the fire. If using the CO_2 extinguisher be sure to hold it by the handle. The gas coming out of the cone nozzle is very cold and skin will adhere to the nozzle.

   For further information on fire safety and prevention refer to UTHSCH Emergency Situation Response Plan (http://www.uth.tmc.edu/safety/).

8. Minimize use of flammable and combustible materials in the laboratory.

9. Shut off all gas/air valves at the end of each laboratory period. Turn off all Bunsen burners and alcohol torches when they are not being used.

10. Spill clean up is everyone's responsibility. Broken glass is to be picked up with forceps, mechanical means, or a broom and dustpan, **not with fingers**.

11. All users should use proper postural positions when working in the laboratory. Take periodic breaks from working in order to avoid fatigue.

12. All accidents should be reported immediately to faculty or laboratory technician. If faculty member or lab technician is not immediately available, a nearby clinical dispensary or the Director of Clinical Services should be notified at ext. 4008. After hours and on Saturday, personal physician or an emergency room should be consulted for any care that is needed.

13. Do not blow dust off cast/prosthesis with breath. Remove dust by using laboratory air supply.

14. **Sharps containers are in each laboratory**. Used blades, pins, broken glass or other like items must be placed in a sharps container.

B. Infection Control

General Requirements

1. Wash hands after handling equipment, removing gloves, after contact with body fluids, and before leaving the laboratory.
2. No eating or drinking, handling contacts or applying cosmetics is allowed in the laboratory area.
3. All appropriate personal protective attire must be worn when working in the laboratory, such as apron or gown, eyewear, and mask.
4. Laboratory attachments that have been used on contaminated prosthesis will be kept separate from those used on new prosthesis.
    a. Use sterilized rag wheels on new prosthesis and sterilizes those used on contaminated prosthesis after each use.
    b. All surgical and other instruments that normally penetrate soft tissue or bone (e.g., forceps, scalpels, bone chisels, and burs) must be scrubbed, rinsed, disinfected, dried and sterilized after each use.
    c. Instruments that are not intended to penetrate oral soft tissues or bone (e.g., amalgam condensers, burs and plastic instruments), but which may come into contact with oral tissues must be scrubbed, rinsed, disinfected, dried and sterilized after each use.
    d. A liquid iodophor will be used as a mixing medium in pumice.

During Patient Care and/or Working With Items from the Mouth

1. Students must disinfect the items listed below before they are brought to the clinical laboratory for additional procedures.
2. Impressions should be disinfected as described in Section H below.
3. Prostheses should be rinsed and scrubbed gently but thoroughly with antimicrobial soap. Extra care should be taken to remove plaque, calculus, and other debris from old prostheses. If necessary, use calculus and stain remover in an ultrasonic cleaner. Prostheses must be placed in a clean sealed bag for this procedure. They should be rinsed with water, dried with paper towels and disinfected using the spray technique. Gloves should then be removed and the prosthesis should be rinsed with water and immediately removed from the field of contamination and placed in a disposable plastic bag.
4. After laboratory procedures are completed, all items should be washed with antimicrobial soap and thoroughly rinsed before leaving the dental laboratory for return to the operatory. This protocol pertains to performing laboratory procedures on all the following items and prostheses, both fixed and removable:
    - Complete dentures
    - Crowns
    - Fixed partial dentures
    - Impressions
    - Inlays / Onlays
    - Mouthguards / Occlusal splints
    - Occlusion rims

- Record bases
- Removable partial dentures
- Separate instruments, attachments and materials used with new prostheses from those that are used with prostheses or appliances that have been inserted in the mouth.
- Waxed dentures and similar items

C. Attire

All students are expected to follow proper clinic attire during regular clinic/laboratory working hours as described in Section 1.31 of the Clinic Manual.

During patient visits, students must wear a disposable yellow gown when working with fixed or removable prostheses from the clinic. Students who are not treating patients should also wear disposable yellow gowns while in the lab to protect themselves from potentially infectious aerosols and spatter.

D. Submitting Cases/Case Acceptance

1. Removable cases for both 3rd- and 4th-year students will be accepted at the window of the Tooth Room (Room 123). Fixed cases for 3rd-year students must be submitted to the Department of Prosthodontics, Room 422. Fixed cases for 4th-year students must be submitted to the Department of Restorative Dentistry, Room 475.
2. Casts must be mounted on a semi-adjustable articulator, the working cast, mounting stone and dies should be trimmed, and the margins of the working dies identified with a red pencil.
3. Complete dentures must be submitted properly waxed for flasking.
4. Casts turned in for fabrication of RPD frameworks must be poured in the appropriate stone. All master casts must be tripoded and the opposing cast must be turned in with the case. All casts must be dry.
5. Impressions will be accepted from faculty for fabrication of restorations for patients under their direct care. Faculty members are required to trim their own dies and outline the margins in red pencil. Student submissions will be given priority over faculty.
6. All dental student cases submitted for fabrication of fixed prosthesis will be reviewed by the Laboratory Quality Review Committee, assigned a case number, logged in, and assigned to the appropriate technician.
7. All completed cases are reviewed before they are returned. The necessary laboratory time for common procedures is listed below as a guide and provided to the dental student at submission of case. The Faculty Supervisor determines length of time required for completion. If the turn around time becomes lengthy, as is often the case in the spring semester, some cases may be sent to a private dental laboratory. The typical completion times (in working days) are as follows:

    a. Repair removable appliances – 1 to 2 days
    b. Mouth guards, fluoride carriers, stents, etc. – 5 days
    c. Removable partial denture frames and metal denture bases – 7 to 12 days
    d. Denture processing (complete, immediate, partial) – 5 to 7 days
    e. Temporary treatment partial dentures, nightguards, surgical splints, etc. – 5 to 7 days.

f. Pinned fixed casts – 3 days

g. Post and core direct – 2 days

h. Post and core (indirect), waxed and ready to cast – 2 days

i. Post and core (indirect – faculty) – 10 days

j. Single gold crowns – 10 days – wax, cast, finish

k. Porcelain fused to metal (PFM) crowns – 15 days

l. Fixed partial dentures – 15 days

m. Fixed partial dentures (PFM) – 15 days

n. Invest and cast student wax-ups, crowns, bridges – 7 days (try-in) 10 days (completed)

E. Dental Casts

Stone and plaster casts must be disinfected with the iodophor spray technique after they are poured by spraying until wet with iodophor. Casts to be disinfected should be fully set (i.e., stored for at least 24 hours) and need no further disinfecting as long as they remain in the laboratory. Stone casts that are taken from the laboratory for use in the clinic operatory must be spray disinfected before they are returned to the dental laboratory.

F. Polishing Acrylic Resin

1. Obtain the following from the laboratory supply station:
    - Unit dose of pumice (place in pumice container and wet with disinfectant)
    - Disposable drape material
    - Disposable plastic bag
2. Obtain the following from the Clinical Laboratory:
    - Disposable pumice container (repacked or prepackaged)
3. Obtain the following from Room 123 ("Tooth Room"):
    - Sterile pumice rag wheel
    - Sterile high shine rag wheel
    - High shine compound
4. Safety glasses, facemask, and apron or gown must be worn when polishing dentures. The safety shield of polishing lathe must be in place and suction must be on. When gloves are worn during operation of a lathe, extreme caution must be taken to avoid injury resulting from the glove catching in the lathe. The risk of infection when handling contaminated items is considered greater than the physical hazard; therefore, gloves should be worn when necessary and appropriate caution exercised.
5. Unfold disposable drape to serve as a protective barrier under the disposable pumice container. Place pumice container on drape and use the sterile rag wheel to apply pumice.
6. After pumicing is complete, remove rag wheel and lay on drape in case the denture requires additional pumicing.
7. Place a clean polishing rag wheel and apply the polishing compound to the high shine rag wheel and complete the polishing procedure.

8. After polishing, use ultrasonic bath to remove polishing compound if necessary. Then wash prostheses with antimicrobial soap and rinse thoroughly before placing it in a plastic bag. Place apron, tray and drape in waste receptacle and place rag wheels and high shine compound in designated recovery containers.

G. Polishing Metal Prostheses

1. Clinic Operatory Protocol
    a. Metal prostheses must be disinfected prior to adjusting or polishing in the operatory.
    b. Safety glasses and a facemask must be worn when adjusting or polishing metals in the operatory.
    c. After polishing, the prostheses should be washed with antimicrobial soap and rinsed thoroughly.
    d. If the prostheses is not to be immediately delivered, it must be stored in a clean plastic bag, and must be disinfected prior to insertion, try-in or cementation.
    e. Dental laboratory technicians are also available for polishing the metal areas of prostheses.

2. Clinical Laboratory Protocol
    a. Safety glasses, face mask and a disposable apron must be worn when polishing metals. Latex gloves or overgloves must not be used during lathe polishing. Vinyl gloves are optional, and if worn, extreme caution must be taken to avoid catching gloves in the lathe.
    b. Unfold disposable drape to serve as a protective barrier.
    c. After polishing, the prostheses should be washed with antimicrobial soap and rinsed thoroughly. Place all contaminated disposables in the designated waste receptacle.
    d. If the prostheses is not to be immediately cemented, or inserted as in removables they must be stored in a clean plastic bag, and must be disinfected prior to try-in, cementation, or insertion.

H. Disinfection of Dental Impressions

All impressions must be disinfected. The impression should first be rinsed thoroughly in the sink to remove saliva, blood and other debris. Then it must be sprayed with disinfectant until the surface is saturated, and held inverted so that excess fluid can drain. The impression is then covered with a paper towel saturated with disinfectant and placed on stainless steel countertop. After ten (10) minutes the impression must be rinsed with water.

Most impressions can be disinfected with an iodophor. However, if a specific clinical division/ department determines that this is not suitable, then alternatively the impression may be disinfected with sodium hypochlorite, 1:10 dilution of bleach, with approval of the Clinical Affairs Committee.

I. Dental Laboratory Storage

Assignment of lab drawers in the Clinical Laboratory is the responsibility of the Department of Prosthodontics and in conjunction with Educational Support Services. Drawers are made available as a convenience to those students who are willing to accept responsibility for sharing drawers with other students.