Women Dental College,
Abbottabad

ABBOTTABAD

Lab Manual

Phantom Head Lab

Operative Dentistry

Created By: Dept. of Operative Dentistry & Endodontics

Phantom Head Lab

Table of Contents

Description:

The phantom head lab of operative dentistry department of Women Dental College was constructed in 2012; the purpose of the phantom head lab was to support the acquisition of clinical skills through hands-on training within a non-threatening environment.

Learners commonly practice the procedural skills' psychomotor component under the trainers' instruction, who have previously demonstrated the relevant skill. Subsequently, the skills are then performed by the learners themselves under supervision.

Aims and Objectives:

The core aim of the skills lab is to

1. Help undergraduate students learn the correct steps and sequence for performing a skill.
2. It also helps to measure students’ progress in learning as they gain confidence in the skill.
3. Ensure patient safety.
4. Using high-speed handpiece to practice making different cavity designs

The mission of the laboratory is to promote clinical competence, ensure patient safety and enhance the skills of dental students (both undergraduate and postgraduate) during their training.

Faculty Responsible for Course Conduction

Sr.No	Faculty	Department	Designation
1.	Prof. Dr. Imran Shah	Operative Dentistry	HOD
2.	Ass. Prof. Dr. Mohammad Shahid	Operative Dentistry	AP
3.	Dr . Mohammad Abbas	Operative Dentistry	SMO
4.	Dr . Abdullah Jadoon	Operative Dentistry	MO
5.	Dr . Zalanda Orakzai	Operative Dentistry	MO
6.	Dr . Hebbah Mushtaq	Operative Dentistry	MO

Equipment

Model 1:
Model name: Phantom Head

System components:

1. Phantom head
2. Metal rod
3. Two brass jaws
4. Typhodont teeth

FUNCTIONS:

Phantom heads provide an efficient way to teach preclinical students dental procedures safely while increasing their dexterity skills considerably.

Model 2:
Model name: Dental Unit

Features:

The dental chair consists of several components that work in concert to provide a comfortable and functional seating arrangement for the patient.

- **Seat - The seat is where the patient sits and should be comfortable and supportive.**
- **Backrest - The backrest supports the patient's back and neck during the dental procedure.**
- **Headrest - The headrest supports the patient's head and neck to ensure the patient is in a comfortable position.**
- **Armrests - Armrests provide support for the patient's arms to ensure they are comfortable throughout the procedure.**
- **Footrest - The footrest supports the patient's feet and ensures that the patient is in a comfortable position.**

Functions of a Dental Chair

The dental chair has several functions that contribute to a smooth dental experience for both the patient and the dentist.

Durability

The dental chair is designed to withstand constant use and last for years. They are made of high-quality materials that maintain durability and functionality even after years of use. And most dental chairs come with a warranty, giving dentists the peace of mind that comes with knowing they are getting durable and reliable equipment.

Visibility

The design of the dental chair ensures that the dentist has maximum visibility of the patient's mouth during the dental procedure. The headrest is adjustable so the dentist can see the patient's mouth clearly, and the dental chair is designed to ensure that the patient's body does not obstruct the dentist's view.

Adjustability

The dental chair is designed to be easily adjustable, allowing the dentist to position the patient's body in the optimal position for the dental procedure. The height of the dental chair is adjustable, meaning it can be raised, lowered, or tilted to allow the dentist better access to the patient's mouth comfortably. In addition, the backrest, headrest, footrest, and seat can be adjusted independently to provide a comfortable experience for the patient.

Sterilization

The dental chair is easily disinfected to ensure optimal hygiene during dental procedures. The dental chair's surface is usually made of non-porous material that is easy to clean and disinfect. The chair's upholstery can be easily removed and disinfected separately, making sure that patients are not exposed to any potential contaminants.

Patient Comfort

The dental chair is designed to provide maximum comfort for patients, ensuring they are relaxed throughout the dental procedure. The chair's upholstery is made of soft, comfortable materials, and the contour of the seat and backrest provides support and comfort for the patient. The dental chair also has adjustable armrests that give additional support to the patient's arms.

Integrated Technology

Modern dental chairs are equipped with integrated technology that enhances dental procedures. The chair's headrest can be fitted with a camera that allows the dentist to capture images of the patient's mouth. Furthermore, the chair can be fitted with a LED light that gives the dentist optimal illumination during the procedure. The treatment chair's integrated technology ensures that dental procedures are performed accurately and without error.

Model 3:
Model name: **Autoclave**

Components of an Autoclave

- Vessel. The vessel is the main body of the autoclave and consists of an inner chamber and an outer jacket.
- Control System.
- Thermostatic Trap.
- Safety Valve.
- Waste-Water Cooling Mechanism.
- Vacuum System (if applicable)
- Steam Generator (if applicable)

Functions of an autoclave

- The autoclave works on the principle of moist heat sterilization where steam under pressure is used to sterilize the material present inside the chamber.
- The high pressure increases the boiling point of water and thus helps achieve a higher temperature for sterilization.
- Water usually boils at 100°C under normal atmospheric pressure (760 mm of Hg); however, the boiling point of water increases if the pressure is to be increased.
- Similarly, the high pressure also facilitates the rapid penetration of heat into deeper parts of the material, and moisture present in the steam causes the coagulation of proteins causing an irreversible loss of function and activity of microbes.
- This principle is employed in an autoclave where the water boils at 121°C at the pressure of 15 psi or 775 mm of Hg.
- When this steam comes in contact with the surface, it kills the microbes by giving off latent heat.
- The condensed liquid ensures the moist killing of the microbes.
- Once the sterilization phase is completed (which depends on the level of contamination of material inside), the pressure is released from the inside of the chamber through the whistle.
- The pressure inside the chamber is then restored back to the ambient pressure while the components inside remain hot for some time

Model 4

Model name: Amalgamator

An amalgamator is a mechanical device used in dentistry to mix dental materials, such as amalgam alloys and dental cements, at different speeds to ensure proper trituration and consistency of the mixture.

Features:

1. Electric motor
2. Holder for receiving the capsule

Functions:

An amalgamator is used in dentistry to mix dental materials, such as amalgam alloys and dental cements, at different speeds to ensure proper trituration and consistency of the mixture

Model 5:

Model name: Endomotor

Endo Motor products are mainly used in dental root canal preparation

The equipment has the following characteristic

1. Integrates the function root canal preparation

2. The precise feedback technology, are sensitive to control the motor output torque, in order to protect the root canal file

3. Cordless handle , operating freely.

4. Large capacity battery equipped with wireless charging system, Ensure long enough use time.

Model 6
High speed handpiece

A dental handpiece, or dental drill, uses a rotating bur to precisely remove tissue in the mouth. ‘High speed’ describes any handpiece that runs at speeds of between 300,000 and 450,000 RPM.

Most high speed handpieces are powered by air, but electric high speeds are also available. About 76% of dentists use air turbine handpieces, 16% use electric, and 8% use both. This article will focus on air driven high speeds.

All high speed handpieces have two main parts: the body or shell and the turbine. High quality handpieces have a stainless steel or titanium body.

Lower-quality handpieces are made of brass, which is lighter and cheaper to manufacture. Brass is weaker, more susceptible to wear, and unable to withstand repeated sterilization cycles than stainless steel or titanium.

Dental high speed handpieces come in a variety of designs, but all run between 300,000 and 450,000 rotations per minute. Different models can be distinguished by its attachment type, head size, light source, weight, and motor noise.

Model 7
Slow speed handpiece

Features:

1. A hand held motor, usually air-driven (can also be electric), that spins a cutting bur or prophy cup at 50,000 RPM or less.
2. An airline is attached to the back end of the handpiece, similar to a high speed handpiece.
3. When air is introduced into the handpiece (via the chair unit foot pedal), air is forced over the vanes of the rotor (consisting of vanes or blades), which causes it to spin.
4. After the air moves around the rotor, it is forced out through the handpiece's back end exhaust port

Functions:

1. Used for removal of caries, refining a cavity preparation, performing prophylaxis, and other endodontic and implant procedures.
2. Straight attachments that use handpiece burs are generally used for trimming prosthetics

Curriculum Map for Undergraduate Medical Students:

S.No	Class	Topic	Learning Outcomes	Teaching Hours	Mode of Teaching	Assessment Tools
1	3rd BDS	Class 1 cavity	to remove caries and create a foundation for the restoration	2 hrs	Demonstration	Formative Assessment
2		Class 2 cavity	to remove caries and create a foundation for the restoration	2 hrs	Demonstration	Formative Assessment
3		Class 3 cavity	to remove caries and create a foundation for the restoration	2 hrs	Demonstration	Formative Assessment
4		Class IV cavity	to remove caries and create a foundation for the restoration	2 hrs	Demonstration	Formative Assessment
5		Class V cavity	to remove caries and create a foundation for the restoration	2 hrs	Demonstration	Formative Assessment
6		Class VI cavity	to remove caries and create a foundation for the restoration	2 hrs	Demonstration	Formative Assessment
1		Restorations	to remove caries and create a foundation for the restoration for biological, mechanical & esthetic	4 hrs	Demonstration followed by discussion	OSCE/ Formative assessment

			purposes			
2	Final year BDS	RCT	The aim of the treatment is to remove all the infection from the root canal	4 hrs	Demonstration followed by discussion	OSCE/ Formative assessment

Standard Operating Procedures (SOPs):

The following guidelines for the smooth running of Skills and Simulation lab are presented and the users are expected to follow these.

- Students are strictly prohibited to write anything on the manikins, tables, walls etc.
- After using them in the skills lab, needles and blades should be disposed of in the closest sharps container rather than being reused.
- Doors should be firmly closed and locked while leaving the lab area, and lights should be turned off.
- It is not encouraged for students to record movies or take photos of the manikins; instead, they will respect the manikins' privacy and confidentiality when using the skills lab. All students who wish to utilize the skills lab manikins must abide by this regulation; violating it will result in disciplinary action taken against the offending student.
- Students are not to be left unattended by faculty or staff at any time.
- In case any faculty members or students get hurt, a first aid kit will always be on hand in the skills lab.
- No food and drinks will be allowed in skills lab.
- Unauthorized persons are not allowed in the labs at any time.