



Subject: Medical Instrumentations
Lecturer: MSc. Mohammed Tareq Fakhri
Class: Second Class
Academic year: 2023-2024
Lecture: fifth lecture



Wax bath

Introduction: Its medical instrument used the heat by the use of wax as a media of heat transmission. Is one of the devices the task used in physical therapy widespread uses the principle of latent heat through the wax of the type which is a special wax (paraffin), which is a special kind of prefer to use **because** it is gaining heat slowly and lose it slowly and to keep the parts warm to allow for healing. The actual temperature of paraffin wax is 42-52°C whereas its melting point is 51-54.4°C.

The parts of wax bath

- A. Mechanical part.
- B. Electric part.

Mechanical part:

1. The Coat.
2. Fiber glass.
3. The external form (wax)
4. Container.
5. The chamber.
6. The shelves (mesh).
7. Drain.





The coat (Outside shields)

The coat is made of aluminum or stainless steel because resisting the mechanical shocks, resisting the oxidation & rectangle solid shape to be easily placed anywhere.

The coat consists of several surfaces an isolator material prevents heat from getting outside.

1. Fiber glass: There are two type of it first:

a) **Brown fiber glass**

b) **Yellow fiber glass**

2. wax container: It is a container containing wax[paraffin wax] used in the treatment process and is made of stainless steel and be **mobile** in order to ease switch to different parts of the body.

3. The chamber: The chamber is completely made of aluminum or stainless steel, rectangular solid shape to suit dealing with various objects, it has thermally insulated from all other part It also contains **a container of water** must be distilled water because it contains salt which is responsible for melting the wax and keep it in a liquid state by heating the water by heater

A. Electric part:

1. The power supply.
2. The heater.
3. Thermostat.
4. Temperature indicator (thermometer). 5. Timer. 6. Fuses. 7. Control panel.



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1. Power supply

The used supply in dry sterilized bath is 220v — 50Hz the step down transformer and rectifying circuit (AC to DC convert) to run the control panel if the parameters, numeric or other departments in the modern fashion.

2. The Heater:

The electric heating system is the system in which heating produce by rising of temperature caused by the passing of electric current through a conductor having a high resistor to current flow; it is only placed in base of the instrument.

3. Thermostat :

Is a sensor of heat connecting directly with heater and the separation of heater in certain degrees so as to obtain the temperature we need as needed and also used to protect the device.

4. Temperature indicator:

Two ways are used in temperature indicator there are thermometer (used to measure temperature of material) and thermocouple & Identified for the internal temperature.

There are several types of thermometer

- 1) ***Mechanical thermometer***: the principle of it is depending on the expanding factor of different material like mercury where it is used more than alcohol because its wide thermal range for mercury from (-70 -350).
- 2) ***Electrical thermometer***: - the principle of it is depend on electrical conductive property for the material.



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5. Timer: There are two type of timer electrical or mechanical at range 5-60 min givenperiod of time required for sterilization.

6. Fuse: To protect the circuit from high current, high loads, short circuits..

7. Control panel: Contains several elements and the most important about indicator power lamp usually green & indicator heater lamp usually red & contain switch on-off and timer & knob.

There are three reasons to select paraffin wax:

1. The wax vaporizes in very high temperature.
2. The wax considers low electric connectivity material.
3. The waxes miss the heat slowly& the wax keeps the heat to possible long time (20-30 minute).





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Method of treatment:

1. Remove watch and rings, in the treatment area, if rings cannot be removed, cover them with several thicknesses of gauze and hold the gauze in place with masking tape.
2. Protect the patient clothing from the paraffin because it causes skin scrape(sensitivity),
3. Explain to the patient that the paraffin will feel hot, but it not burn.
4. Inspect the part to be treated
 - The skin must be clean into the contaminate the tank. If it is not clean, the patient must be washing it with soap and water.
 - The skin must be dry and free from perspiration because it may cause burn.
 - The skin must be free from draining lesions, rashes and scratches which must be covered by gauze.
 - Check skin sensation, if skin sensation is not normal, use wax with caution.
 - Be sure the bath temperature is not over 54.4 degree centigrade.

Advantage of wax bath

1. Fast, acting, drug, free heat therapy.
2. Proven effective to smooth pain and stiffness.
3. Effective on arthritis, joint stiffness, muscle spasms, dry cracked skin and more.
4. Versatile, safe, and easy to use.



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Disadvantage of wax bath

1. Sedimentation occurs at the bottom of the bath, the bath must be cleaned regularly atleast twice a year.
2. Contamination of the wax by atmospheric dust may occurs unless the lid covers itwhen not use.

Faults & repair:

Which is a few faults due to the lack of electrical parts in the device because it does not contain many electronic parts and faults in this device is (heater - thermostat – sensitive — switch on/off - fuse) and the repair is to replace damaged parts .

About wax bath:

The principle of operation of the device is heating water and the way you are melting wax is used in physical therapy and treatment is a natural by immersion may not be possible in some places access to the immersion are used way Spilling the places to be treated or using the brush to get to difficult places and prefer to use paraffin wax so as to acquisition of the heat slowly and the loss of slowly making it a good treatment of the joints to keep them warm for a long time that the treatment of the wax up (approximately 54 C) .

