

## 10. VACUUM EXTRACTORS

### 1. Purpose of Equipment

To aid the safe delivery of babies.

### 2. How the Equipment Works

See Figure 41.

#### The equipment consists of:

- hand vacuum pump
- vacuum bottle
- rubber vacuum tube (from pump to bottle)
- vacuum gauge
- rubber plug (bung) with stainless steel inlet and outlet tubes
- rubber vacuum tube (from vacuum bottle to suction cap) which includes a traction handle with hook and chain

The selected suction cap is placed on the baby's head when it appears. The screw valve on the vacuum pump is closed and the pump is pumped by hand until a vacuum is created. The level of this is indicated on the vacuum gauge.

The suction cap becomes attached to the baby's head.

The traction chain and handle are used to gently draw the baby from the uterus.

When the baby is delivered, the screw valve is opened. Air flows in and breaks the vacuum. The baby is released.

### 3. Routines and Safety

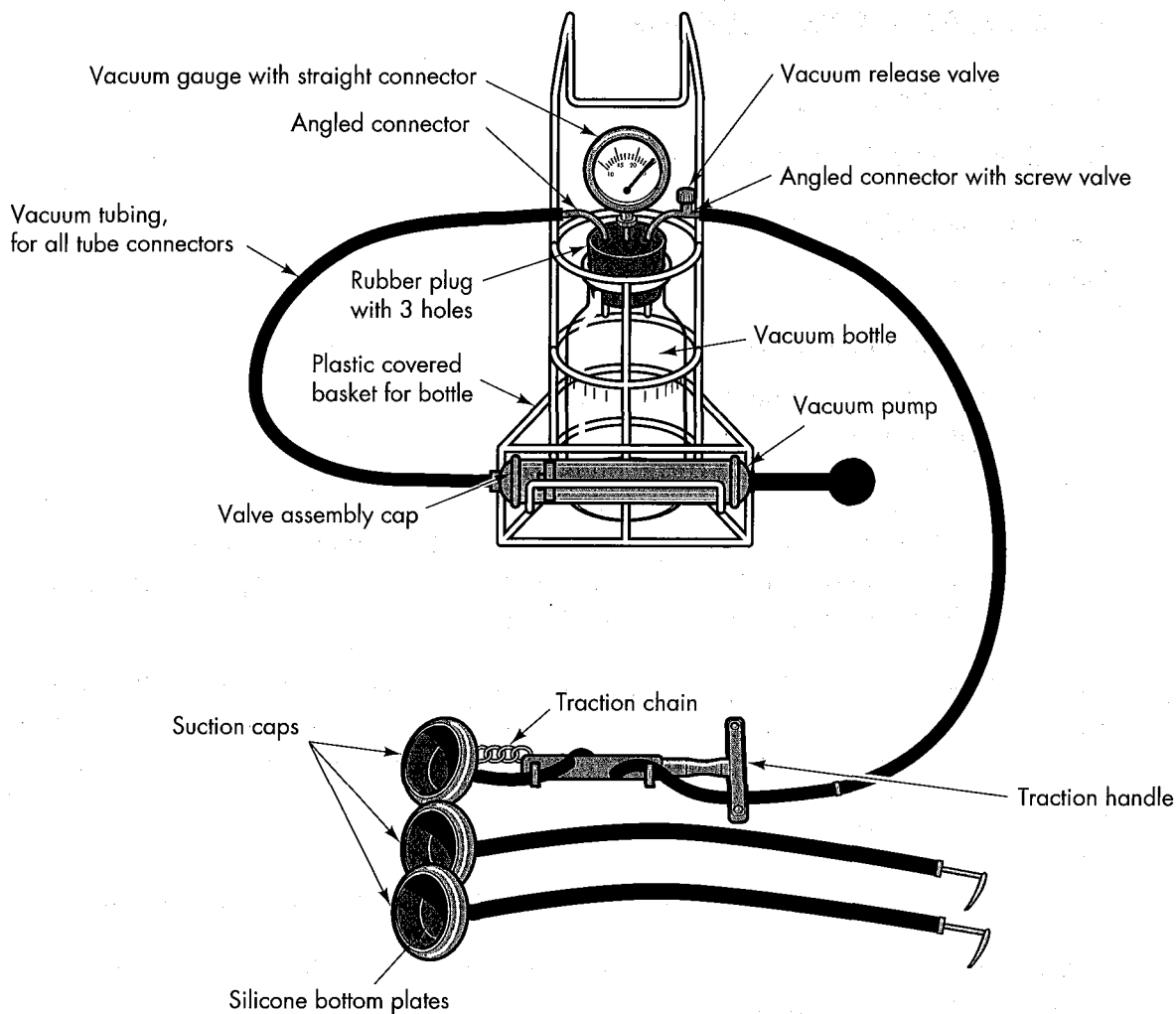
This equipment must be kept in first-class condition.

After each use all parts which can be sterilised should be autoclaved. Check with the manufacturer's manual. The parts are likely to be the suction cap, the vacuum jar and the rubber tubes.

All parts of the machine should be kept together and numbered. They should be stored in a kit box supplied by the manufacturer or made locally, in a clean, well-ventilated area.

#### Daily:

- check that a full set of the equipment is available
- check for visible damage to the rubber tubes, vacuum bottle or rubber plug
- check that the vacuum release valve has a knob and washer
- check the traction chain for wear or damage
- check that the stainless steel connector tubes and gauge fit firmly into the rubber plug
- check that the suction caps are not damaged, especially around their rims
- check that the silicone bottom plates are not damaged or split
- check the pump and gauge for external damage



**Figure 41:** Vacuum extractor

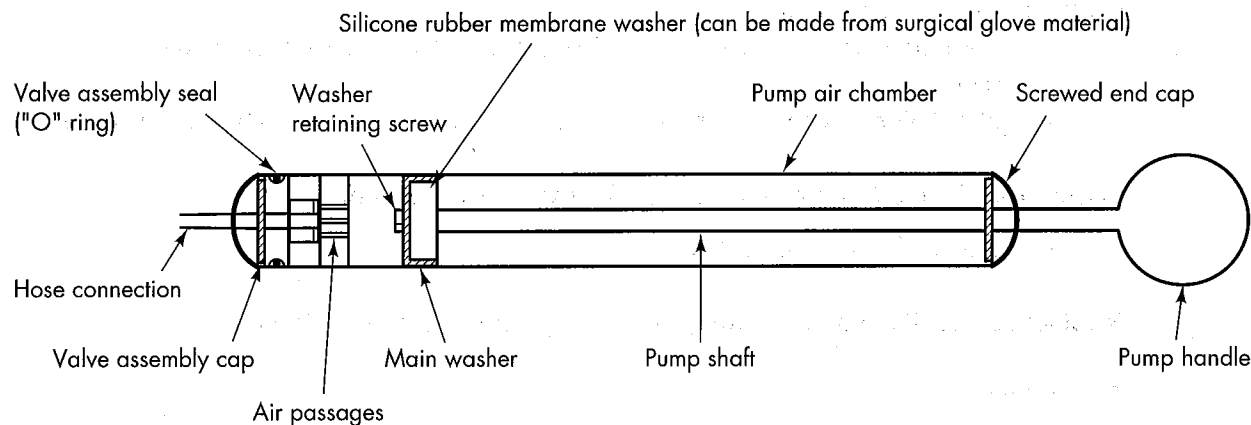
**Weekly** (or monthly if equipment is not often used):

**a. check the vacuum pump:** (Figure 42)

- unscrew the cap and withdraw the pump handle shaft
- check the main washer for wear and apply a little vaseline. This will help produce an airtight seal between the washer and the internal pump case
- refit the pump handle and shaft
- unscrew the valve assembly cap and remove valve
- check the pump seal (this may be an 'O' ring)
- check the silicone rubber membrane washer and replace if necessary (if a spare is not available, use a piece of a surgical glove)
- check any other washers
- refit valve assembly

**b. check the system:**

- assemble the equipment using the 40mm suction cap supplied for checking purposes. Do NOT use the cap from the clinical kit
- make sure all connections fit tightly
- apply a little vaseline to the rubber plug
- close the screw valve
- with the help of a colleague press the suction cap against your forearm and tell the colleague to pump. Check that the gauge is registering a vacuum. Check required levels with medical staff and do not exceed these when testing. Open the screw valve and release vacuum



**Figure 42:** Vacuum pump parts

**4. How to Use the Equipment**

Always refer to the manufacturer's instructions for specific advice on the equipment you are using. The following are general guidelines only.

- i. assemble the equipment as shown in Figure 41
- ii. select the appropriately sized suction cap and place it on the baby's head
- iii. ask a colleague to start pumping
- iv. note vacuum registering on gauge and stop when the predetermined level is reached. The cap will then be 'sealed' to the baby's head
- v. check that the connection is satisfactory
- vi. use traction to draw the baby from its mother's uterus
- vii. open screw valve to release baby

## 5. Simple Fault-finding and Maintenance

*Example a:*

Machine is not working satisfactorily:

- check tube connections are tight
- check rubber plug is fitting tightly (apply a little vaseline to make a tighter seal)
- check connector pipes fit tightly into rubber plug
- check vacuum jar for cracks and rim for chips
- check rim of suction caps for wear
- check silicone bottom plates for cracks and splits
- check pump

*Example b:*

Gauge is thought to be faulty:

- try gauge from another machine (return gauge to original machine after test)
- check screw valve control knob is in place and small washer is fitted inside

**When a fault has been corrected or faulty part replaced:**

- check the system again

Replacing a faulty part is a simple task. Copy the existing fittings.

## 6. Spares

A complete machine for emergency use.

All parts can be changed easily without the help of a qualified technician. Therefore all parts of the equipment should be stocked and replaced when used:

- suction cup 40mm
- suction cup 50mm
- suction cup 60mm
- silicone bottom plate 40mm
- silicone bottom plate 50mm
- silicone bottom plate 60mm
- traction chain with 400mm traction handle
- vacuum bottle
- rubber plug
- complete vacuum pump
- silicone rubber membrane washer (can be made from surgical glove)
- pump washer
- valve assembly seals or 'O' ring
- connector with screw valve
- plain screw cap valve
- gauge
- tubing

## 7. User Checklist (to be displayed near the equipment)

Always refer to the manufacturer's instructions.

Keep this equipment in a clean and well ventilated place.

Each part should be numbered and all parts kept together.

To keep this equipment in good working order for as long as possible:

### Daily:

- i. check that the full set of equipment is available
- ii. check for visible damage:
  - cracked or split rubber tubes
  - cracked or chipped vacuum bottle
  - deterioration of rubber plug
- iii. check vacuum release valve has knob and washer
- iv. check traction chain for wear or damage
- v. check stainless steel connector tubes and gauge fit firmly into rubber plug
- vi. check suction caps are not damaged, especially around the rims
- vii. check silicone bottom plates are not damaged or split
- viii. check pump and gauge for external damage

**Weekly (if equipment is not used often, these checks may be made monthly):**

### a. check vacuum pump:

- i. unscrew cap and withdraw pump handle shaft
- ii. check main washer for wear and apply a little vaseline to provide an air tight seal
- iii. refit pump handle shaft
- iv. unscrew valve assembly cap and remove valve
- v. check pump seal (this may be an 'O' ring)
- vi. check silicone rubber membrane washer and replace if necessary.  
Use a piece of a surgical glove if no spares are available
- vii. check any other washers
- viii. refit valve assembly

### b. check system:

- i. assemble equipment using the 40mm suction cap supplied for checking purposes. Do NOT use cap from the clinical kit
- ii. make sure all connections fit tightly
- iii. apply a little vaseline to rubber plug
- iv. close the screw valve
- v. with the help of a colleague, press the suction cap against your forearm and tell the colleague to pump. Check the gauge is registering a vacuum (check required levels with medical staff and do not exceed these when testing)
- vi. open screw and release vacuum

### Report to the Maintenance Officer

- any visible damage
- any fault in pump or system