

**Knowledge domain: Mechanical**

**Unit: Calibration**

**Skill: Non-Invasive Blood Pressure (NIBP) Machine**

**Tools and Parts Required:**

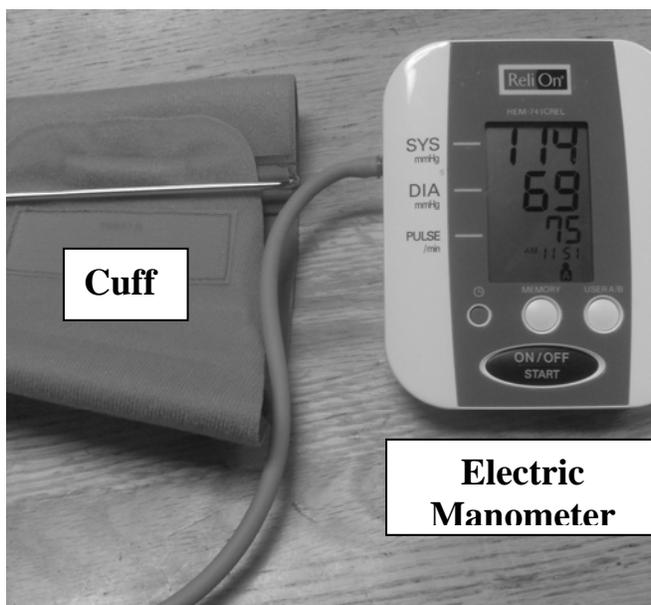
- 1) **Non-Invasive Blood Pressure (NIBP) Machine**
- 2) **BP apparatus**
- 3) **Partner**
- 4) **Stethoscope**
- 5) **Water**
- 6) **Soap**

### **Introduction**

A non-invasive blood pressure machine is a medical device used to measure blood pressure. A non-invasive blood pressure machine is electric. A non-invasive blood pressure machine consists of an inflatable cuff and an electric manometer. The inflatable cuff restricts blood flow to the arm. The electric manometer displays the blood pressure reading. Blood pressure is measured in millimeters of mercury (mm Hg). A non-invasive blood pressure machine does not require a stethoscope.

### **Example**

Below is a picture of a non-invasive blood pressure machine.



### **Identification and Diagnosis**

If a non-invasive blood pressure machine appears to be reporting inaccurate measurements, check for leaks in the tube. Combine water and soap in a bowl. Rub the soapy water over the tube. Look for bubbles. Bubbles indicate a leak. Refer to the BTA skill *Plumbing-Leaking-Cutting Tubes*, and *Plumbing-Leaking-Tape* for information on repairing leaks.

If there are no leaks, you must calibrate the non-invasive blood pressure machine. If a non-invasive blood pressure machine turns on, the non-invasive blood pressure machine will usually work. Teach the nurses or doctors to use the non-invasive blood pressure machine properly. The most common problem with non-invasive blood pressure machine is user error.

### Procedure

To determine if a non-invasive blood pressure machine is calibrated, measure your blood pressure

*How to use a non-invasive blood pressure machine:*



**Step 1:**  
Place the cuff snugly around the upper arm of the patient.



**Step 2:** Place the cuff at approximately the same height as the patient's heart. The cuff should be approximately an inch above the elbow.



**Step 3:**  
Push the button that displays the words "ON/OFF" or "START"



**Step 4:** Wait for the machine to turn on. When the digital display lights up, the non-invasive blood pressure



**Step 5:** Push the "START" button to take the measurement.



**Step 6:** The cuff will automatically inflate. The cuff will automatically deflate. Do not remove the cuff until the display box displays numbers.



**Step 8:** The display box will show three measurements. “SYS” is systolic blood pressure. “DIA” is diastolic blood pressure. “Pulse” is heart rate.

Nurses say, “(systolic blood pressure measurement) over (diastolic blood pressure measurement)” to report blood pressure. Normal blood pressure values are 110-140 mmHg for systolic blood pressure, and 60-90 mmHg for diastolic blood pressure.

Next, ask a nurse to measure your blood pressure with a manual BP apparatus. Compare the two values of blood pressure. If the difference is more than 3 mm Hg, the non-invasive blood pressure machine must be calibrated.

### **Exercise**

Your instructor will give you a non-invasive blood pressure machine. Measure your own blood pressure with the non-invasive blood pressure machine. Repeat the measurement 5 times. Calculate your average systolic blood pressure. Calculate your average diastolic blood pressure.

Ask a nurse to measure your blood pressure with a manual BP apparatus. Check the accuracy of the non-invasive blood pressure machine. The non-invasive blood pressure machine measurements and BP apparatus measurement should match to within 3 mmHg.

Your instructor must verify your work before you continue.

### **Preventative Maintenance and Calibration**

If a non-invasive blood pressure machine is inaccurate, check for leaks. If the non-invasive blood pressure machine is inaccurate and there are no leaks, the non-invasive blood pressure machine is difficult to repair. A broken non-invasive blood pressure machine requires specialized knowledge to repair. Replace the non-invasive blood pressure machine with an accurate non-invasive blood pressure machine.

Always calibrate every medical device before returning it to use.