



## **Clinical Support**

8500 S.W. Creekside Pl.  
Beaverton, OR 97008-7107 U.S.A.  
Telephone: 503-526-4200  
Toll Free: 800-289-2500  
clinicalsupport@protocol.com

# **NON-INVASIVE BLOOD PRESSURE**

## **Introduction**

This article provides a basic introduction to non-invasive blood pressure monitoring (NIBP), with reference to NIBP monitoring with a Propaq vital signs monitor.

For more information about the use of the Propaq monitor, refer to the *Propaq Directions For Use*.

## **Monitoring HR/PR with the Propaq Monitor**

When monitoring a patient using ECG leads, SpO<sub>2</sub>, and/or CO<sub>2</sub>, the rate that is displayed is a true heart rate. If monitoring a patient using NIBP only, what is actually being displayed is the patient's pulse rate. This may be important when assessing your patient's cardiac status because a patient's heart rate and pulse rate may vary if there is any cardiac compromise.

On the Propaq monitor you can set the HR/PR tone loudness to LOW, MEDIUM, HIGH, or OFF. This does not affect the tone of the alarm if a patient exceeds an alarm limit setting.

## **The Oscillometric Method of Measurement**

Most NIBP devices, including the Propaq monitor, use the oscillometric method for determining mean arterial pressure, systolic pressure and diastolic pressure. These devices use a special blood pressure cuff that detects oscillations (or movement) in the arterial walls that are created by cardiac contractions. These oscillations are then transmitted by the cuff hose to a microprocessor within the

monitor that uses cuff pressure information as well as the oscillation amplitudes to determine the patient's blood pressure.

## Importance of Cuff Size

It is essential that you use a cuff that is properly sized for the patient's arm circumference. If you take a blood pressure with a cuff that is too small for the patient's arm it will cause the NIBP monitor to read falsely high. Conversely, too large a cuff can lead to falsely low readings.

**American Heart Association Recommended Bladder Dimensions  
for Blood Pressure Cuffs According to Arm Circumference  
(Cuff Width = 40% of Arm Circumference)**

Upper Arm Circumference	Cuff Name	Bladder Width (cm)
5 – 7.5	Newborn	3
7.5 – 13	Infant	5
31 – 20	Child	8
24 – 32	Adult	13
32 – 42	Wide/large adult	17
42 – 50	Thigh	20

## Additional Recommendations

- Expel all air from the cuff before taking a measurement. Residual air can lead to inaccurate readings caused by a loose-fitting cuff.
- Apply cuff snugly around extremity, making sure you can put one finger beneath the cuff.
- Check the hose connections to both the cuff and the monitor.
- Movement can impede NIBP readings. Therefore, instruct the patient to lie/sit still during the inflation of the cuff.
- CONFIRM the initial NIBP reading with a blood pressure reading taken by auscultation. Be sure to verify this reading on the same extremity.
- Do not place an NIBP cuff on the same extremity where an infusion line is located because it will impede IV flow.
- Do not place an NIBP cuff on the same extremity where SpO2 is being monitored because it will interfere with the continuous monitoring of pulse oximetry and cause the monitor to alarm.

- Do not place an NIBP cuff on an extremity with impaired circulation. It can lead to further compromise in patient's circulation if the cuff is inflated too high.
- Excessive bodily movements of a patient's extremities can mimic oscillations or movement detected by the NIBP cuff and can lead to inaccurate readings.
- Very fast or irregular cardiac rhythms can cause the NIBP monitor to give erroneous or no readings.
- The upper arm is the preferred site for the placement of the cuff. The forearm and ankle can also be used. If a large adult cuff does not fit the upper arm adequately, use an alternate site.

## Care and Maintenance

- Most NIBP cuffs are designed for single use. Disposable cuffs should be disposed of after use on a single patient, or if they become soiled. Wash non-disposable cuffs between patient use. Follow the manufacturer's recommendations.
- It is recommended to change the cuff site every four hours if blood pressure is being monitored frequently. You may use a thin layer of gauze or stockinette between the cuff and the skin for patients who have fragile skin.
- Hang cables in dry designated area and store cuffs when not in use.

## References

1. Guyton, A. (1991). Textbook of Medical Physiology. W.B. Saunders Co. Philadelphia, PA.
2. Loeb, S. (1993). Monitoring Clinical Functions. Advanced Skills. Springhouse Corp. Springhouse, Pennsylvania.
3. Thomas, C. Taber's Cyclopedic Medical Dictionary. 16<sup>th</sup> Edition. F. A. Davis Co. Philadelphia, PA. 1989.
4. Flynn JM, Bruce NP. *Introduction to Critical Care Skills*. St. Louis, MO: Mosby; 1993.
5. Metzgar ED, Polfus PM. *A Study and Learning Tool: Health Assessment (Second Edition)*. Springhouse PA: Springhouse Corporation; 1994.

6. Smith- Huddleston S, Ferguson SG. *Critical Care and Emergency Nursing: 2<sup>nd</sup> Edition*. Springhouse, PA: Springhouse Corporation; 1994.