Health problem addressed

NIBP is an essential indicator of physiologic condition. As one of the most frequently used diagnostic tests, it indicates changes in blood volume, the pumping efficiency of the heart, and the resistance of the peripheral vasculature. Vital signs monitors are used to measure basic physiologic parameters so that clinicians can be informed of changes in a patient’s condition. Depending on their configuration, these units can measure and display numerical data for NIBP, oxygen saturation, and temperature.

Product description

Automatic electronic sphygmomanometers noninvasively measure and display a patient’s arterial blood pressure. The main unit includes controls and a display; it also includes appropriate attached cuffs, probes, and sensors that make possible sequential and/or simultaneous measurements of the parameters. Some of the NIBP monitors can be used as vital sign monitors with the real-time measuring and display of two or more of the vital signs. These monitors typically consist of portable or mobile electronic units. The monitor may be connected to the line and/or powered by internal batteries. Many devices may also perform continuous monitoring during transportation or at the bedside. Vital signs physiologic monitors are intended mainly for periodic automated measuring of the parameters of one or more patients.

Principles of operation

Automatic electronic sphygmomanometers (NIBP monitors) measure by the use of sound and detection of blood sound turbulence (Korotkoff sounds). A microphone positioned against an artery compressed by the device cuff detects the Korotkoff sounds, enabling the unit to directly determine systolic and diastolic values blood pressure values. NIBP is usually measured using cuffs and either auscultatory or oscillometric techniques. The measurement of temperature is typically accomplished using an intraoral sensor, and SpO2 is determined using pulse oximetry sensors. These monitors typically consist of portable or mobile electronic units that facilitate movement from one location to other; the monitor may be connected to the line and/or powered by internal batteries.

Operating steps

The cuffs, probes, and sensors are attached to the patient, and then the monitor will begin taking intermittent or continuous measurements as selected by the clinician. The devices may remain at a patient’s bedside or can be transported by a caregiver for vital signs spot checking throughout a care area. Alarms (e.g., for high blood pressure or low oxygen saturation) can typically be set by caregivers and can be manually temporarily silenced.

Reported problems

Problems associated with monitors are often user-related. Poor cuff placement or sensor preparation and attachment are most commonly reported. Cables and lead wires should be periodically inspected for breaks and cracks. Automatic sphygmomanometry and pulse oximeters may have the inability to effectively monitor patients with certain conditions (e.g., tremors, convulsions, abnormal heart rhythms, low blood pressure).

Use and maintenance

User(s): Physicians, nurses, other medical staff
Maintenance: Biomedical or clinical engineer/technician, medical staff, manufacturer/servicer
Training: Initial training by manufacturer, operator’s manuals, user’s guide

Environment of use

Settings of use: Hospital (all areas), ambulatory surgery centers
Requirements: Battery, uninterruptible power source, appropriate cuffs/sensors

Product specifications

Approx. dimensions (mm): 100 x 150 x 200
Approx. weight (kg): 3
Consumables: Batteries, cables, sensors/electrodes, cuffs
Price range (USD): 580 - 4,500
Typical product life time (years): 10
Shelf life (consumables): NA

Types and variations

Roll stand, portable, pole or bed mounts