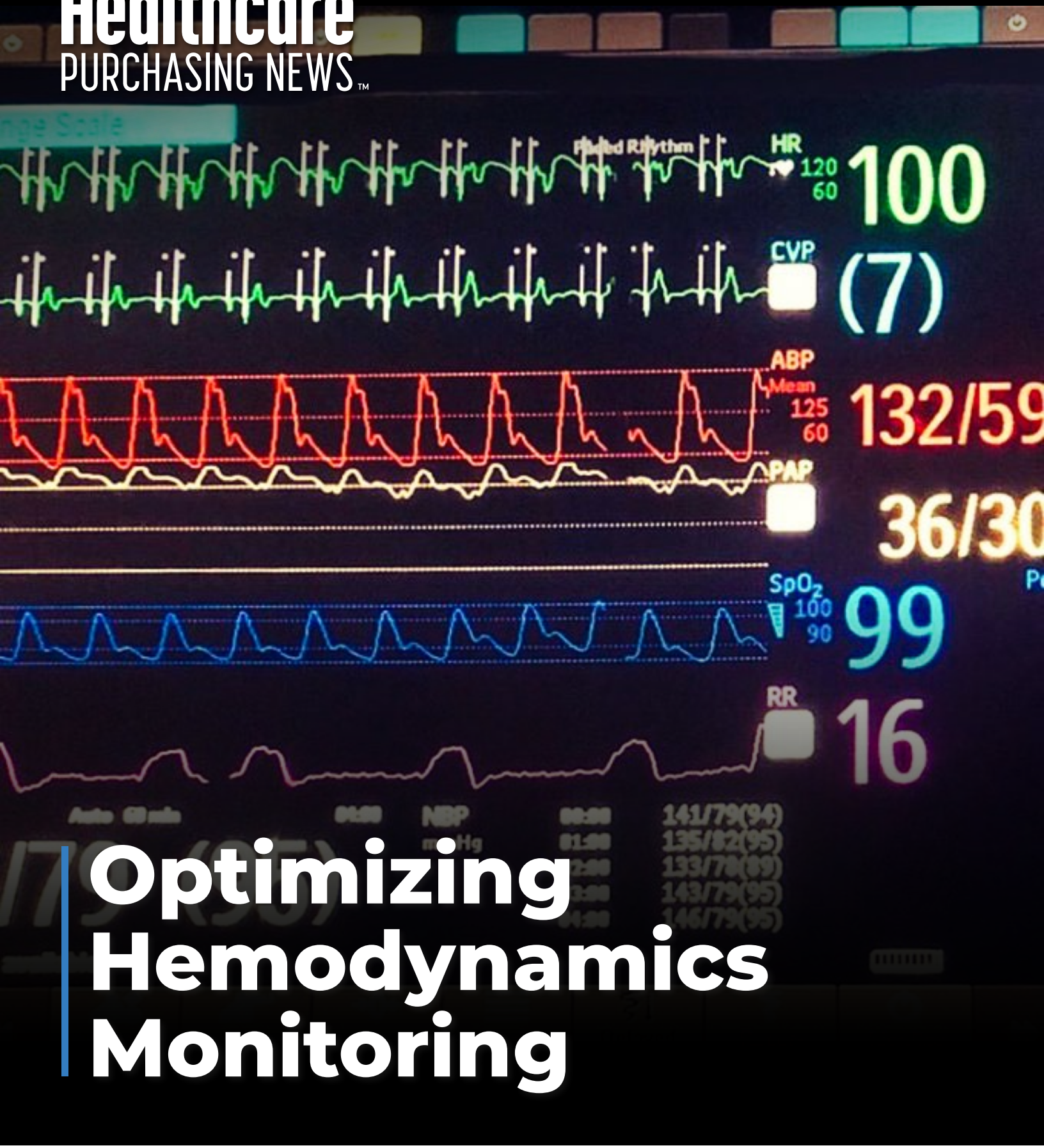
Healthcare
PURCHASING NEWS™



Optimizing Hemodynamics Monitoring

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Nurses on the front lines must constantly assess patients' health status and intervene when necessary. Hemodynamics — accurately measuring patients' cardiovascular function — is a critical aspect of delivering excellent care and achieving the best possible outcomes.

Hemodynamic monitoring gives you the key values needed to make the right decisions, including:

- **Blood Pressure (BP):** High or low BP readings may indicate potential cardiovascular issues that require medication adjustments.
- **Heart Rate:** Abnormal heart rates can indicate underlying heart problems, such as arrhythmias.
- **Cardiac Output:** Reduced output might necessitate interventions to improve heart function.

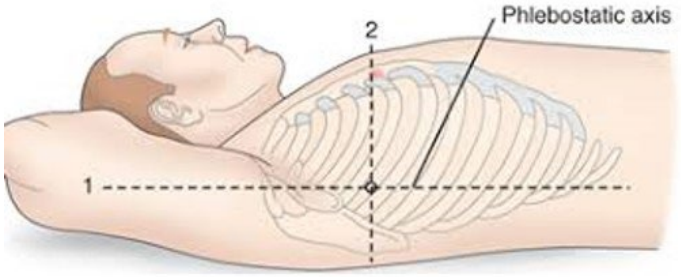
Having the most accurate values in real-time positions allows you to fine-tune medication dosages, track and evaluate treatment effectiveness, identify potential complications, and execute prompt interventions to prevent further decline.

TRANSDUCER PLACEMENT IS CRITICAL TO MONITORING ACCURACY

Proper transducer placement at the phlebostatic axis ensures a reliable reference point for pressure readings and pulse waveform analysis. Placing transducers too high or too low from the phlebostatic axis results in inaccurate readings. The blood pressure measured depends on the hydrostatic pressure, which is influenced by the vertical height difference between the transducer and the heart. A slight difference can cause minor inaccuracies in the displayed waveform. Studies suggest that even small deviations (around 5 cm) can affect readings, but the impact becomes more significant when the distance exceeds 10 cm.[1]

Hemodynamic monitoring of blood pressure and pulse waveform analysis plays a critical role in identifying and managing shock:

- **Early Detection:** Shock can manifest in subtle changes in heart function. By ensuring accurate pressure readings and pulse waveform analysis, clinicians can pick up on these early signs of trouble, such as a decrease in stroke volume or a rise in systemic vascular resistance, which could indicate the onset of shock.
- **Guiding Treatment:** Precise hemodynamic data allows the differentiation between cardiogenic versus septic shock so therapy can be tailored accordingly.
- **Monitoring Response:** Accurate hemodynamic monitoring of pressure and pulse waveform parameters helps assess treatment effectiveness.

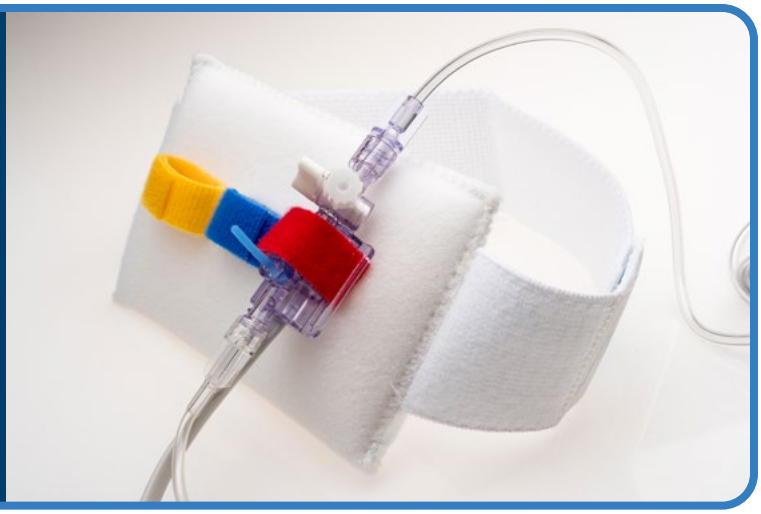


Accurate hemodynamic monitoring with proper transducer placement at the phlebostatic axis also plays a significant role in identifying both cardiovascular and pulmonary disorders, including:

- **Heart Failure:** Stroke volume and cardiac output can reveal weaknesses in heart function.
- **Valvular Disorders:** A narrowed aortic valve, for example, would cause changes in the pulse waveform, indicating a slower rise in pressure during systole.
- **Arrhythmias:** Hemodynamics can relay a low blood pressure, which can be a symptom of an arrhythmia; therefore, when a nurse assesses

DALE TRANSDUCER HOLDERS ARE EASY TO USE

1. Position the Holder along the phlebostatic axis (mid-chest) and wrap it around the patient's arm. Press the hook and loop closure to secure.
2. Open the necessary hook and loop tabs, thread through the slot(s) of the transducer(s), and press to secure.



the low blood pressure, they would assess heart rate and rhythm.

- **Acute Respiratory Distress Syndrome (ARDS):** Hemodynamic monitoring can reveal changes in blood pressure and filling pressures of the heart, aiding in diagnosing ARDS.
- **Pulmonary Embolism:** Accurate data can show signs of right heart strain caused by the increased workload that blockages place on the ventricle.
- **Pulmonary Hypertension:** Hemodynamic monitoring can help assess severity by measuring right ventricular pressure and blood flow.

Effective management of critically ill patients hinges on meticulous hemodynamic monitoring of various catheters in real time. These are highly invasive procedures with an increased risk of complications like arrhythmias and bleeding and require specialized training for the insertion and interpretation of data.

- Arterial Lines[2], typically inserted in the radial or femoral artery, maintain continuous blood pressure measurements and access to rapid blood sampling.
- Pulmonary Artery Catheters (PACs) or Swan-Ganz Catheters[3] provide the most comprehensive hemodynamic data for critically ill patients with complex cardiovascular and pulmonary issues: right atrial pressure (RAP), right ventricular pressure (RVP), pulmonary artery pressure (PAP), pulmonary capillary wedge pressure (PCWP), and oxygen saturation (SvO2).
- The Central Venous Line[4] provides access to the central circulation for the administration of fluids, medications, blood products, parenteral nutrition, and hemodynamic monitoring (central venous pressure — CVP) of right ventricular function and volume status.

TRANSDUCER MANAGEMENT

Nurses play a pivotal role in ensuring accurate hemodynamic monitoring through proper transducer management. Transducers are intricate instruments, and their optimal functioning is crucial for obtaining reliable data that guides patient care.

For example, many medication drips — such as vasopressors for low blood pressure —are titrated based on a patient's hemodynamic status. Inaccurate blood pressure readings due to a mis-leveled transducer can lead to inappropriate medication dosing. It will also become difficult to assess the effectiveness of ongoing treatments and medications.

Due to its location and minimal hydrostatic pressure influence, the phlebostatic axis serves as the standard zero reference level for hemodynamic monitoring. Blood pressure readings taken at this level are considered the most accurate baseline for further analysis.

The consequences of not leveling the transducers to the phlebostatic axis can be significant:

- **Falsely Low Blood Pressure:** If the transducer is positioned above the patient's phlebostatic axis, it will transmit a falsely lower blood pressure.
- **Falsely High Blood Pressure:** If the transducer is positioned below the patient's phlebostatic axis, it will transmit a falsely higher blood pressure.

These hemodynamic details are instrumental in diagnosing shock, cardiovascular, and pulmonary disorders — and the accuracy of these details depends on proper transducer placement. However, some hospitals still rely on outdated or makeshift solutions to keep transducers in place. Inaccurate positioning can lead to delays in diagnosing shock, cardiovascular and pulmonary disorders as well as leading to delays in initiating critical interventions, unnecessary med administration or delays in addressing the underlying cause of the altered hemodynamic values. The accuracy of these details depends on proper transducer placement but despite more reliable transducer holders that maintain placement at the phlebostatic axis, hospitals are still relying on outdated or makeshift solutions to keep transducers at the proper level.

THE IV POLE AND OTHER METHODS

Transducers are often positioned into clips attached to IV poles. While IV poles are a convenient location for mounting transducer holders, the focus should be on ensuring the transducer itself is positioned correctly at the phlebostatic axis for reliable hemodynamic monitoring.

Relying on an IV pole to manage transducers comes with potential risks. IV poles are adjustable for height and different patient needs. However, IV pole adjustments may increase the risk of the transducer being positioned too high or too low, introducing errors[5] due to hydrostatic pressure. In addition, the IV pole's location relative to the patient's body can also affect accuracy. If the pole isn't positioned directly in line with the phlebostatic axis, the transducer is not at the correct level, therefore giving an inaccurate reading. In essence, IV poles offer limited adjustability for precise transducer alignment.

Transducers placed on IV poles are also at risk of being jostled or bumped during patient care and transport, such as moving patients to other rooms for imaging and other routine activities, potentially dislodging the transducer from its optimal position. IV pole placement can also vary between different providers who are caring for the same patients, which can lead to inconsistencies and difficulty in comparing and assessing hemodynamic status over time.

Another method sometimes used is to apply adhesive tape[6] directly to the transducer and the patient's skin. This is not an ideal strategy as the tape is often not secure enough. As patients move, the transducer can also move, potentially compromising data accuracy. Tape can also irritate the skin, especially with prolonged use, and there is a risk of infection if not applied properly. Other methods may include the use of gauze pads to create a wedge or makeshift holder for the transducer and improvised straps made from cloth or tubing, none of which provide a secure solution.

MANAGING TRANSDUCERS THE RIGHT WAY

Single patient-use transducer holders that fit securely on the arm at the phlebostatic axis deliver standardized care with proper positioning and stability at all times. The Dale Transducer Holder gives clinicians and their patients confidence and reliability. Features include:

- Holders stabilize up to three standard-size transducers or two large transducers, as well as a VAMP system.
- Easy positioning at the phlebostatic axis enhances transducer leveling accuracy.
- Quick and easy to apply and remove with the hook and loop fastener system, which saves nursing time.
- The platform is soft and padded, ensuring patient comfort. This structure also helps reduce the risk of hospital-acquired pressure injuries (HAPIs).
- Convenient color-coded tabs for easy recognition.
- The holder moves with the patient during transport to other locations and early mobilization.
- Not made with natural rubber latex

Old methods require frequent verification of blood pressure measurements (such as leveling with a carpenter's level (inc. image), but placing the transducers securely on the arm ensures alignment with the phlebostatic axis and easy visualization at all times. Streamlining the measurement process for nurses reduces stress and measurably improves workflow efficiency.

Additionally, as traditional methods can be prone to errors due to movement, inaccurate positioning of the transducer results in falsely high and low readings, triggering unnecessary alarms.

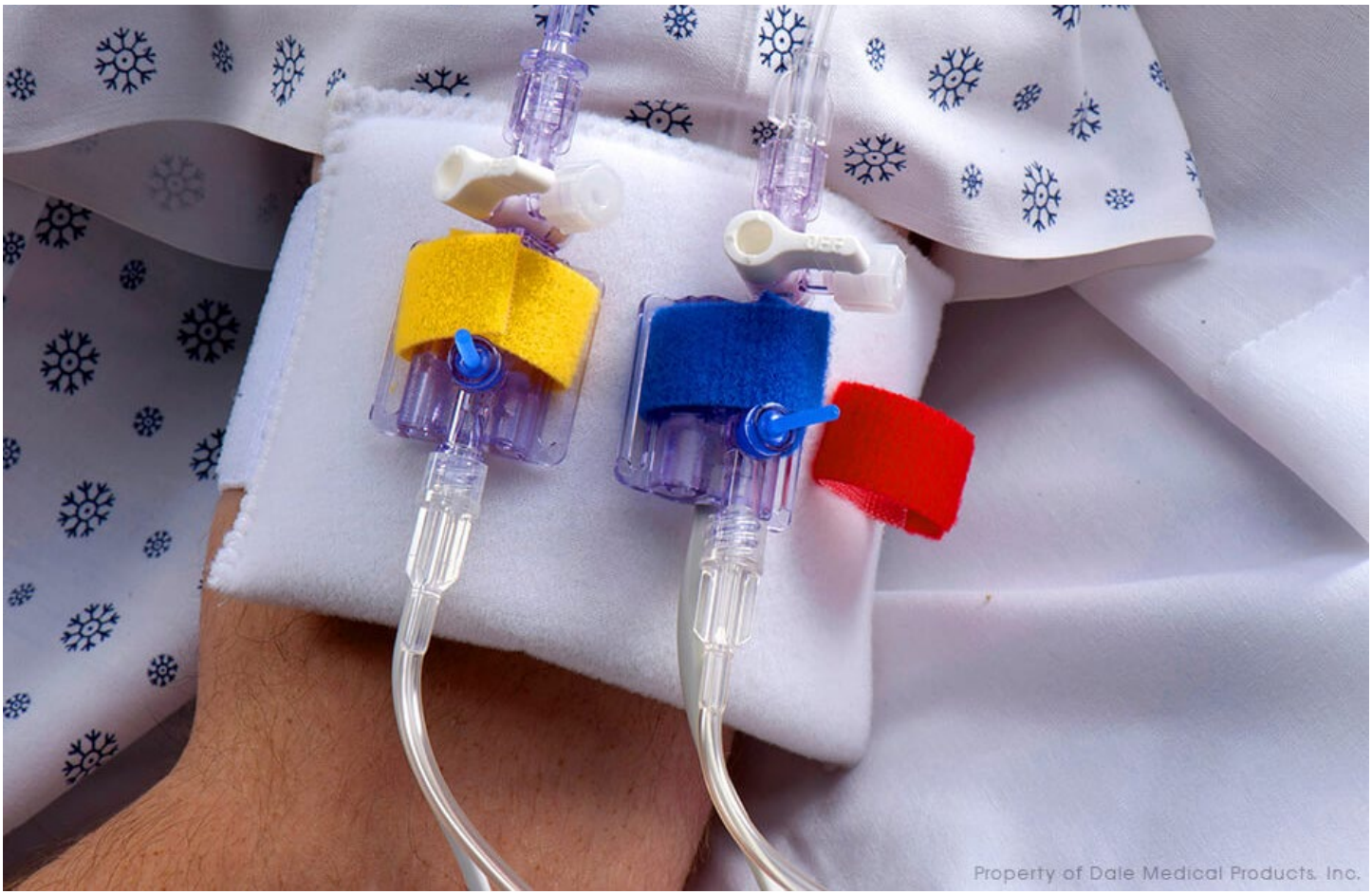
Frequent alarms can seriously disrupt workflow due to alarm fatigue. Desensitized nurses and other healthcare providers can lead to decreased response time[7] to critical situations. Securement of the transducer holder to the arm reduces false alarms and provides accurate hemodynamic readings allowing nurses to provide the best and most efficient care to the patient.

IMPROVED ACCURACY ADVANCES CARE, REDUCES TIME, AND LOWERS COST

The Dale Transducer Holder reduces the likelihood of inaccurate measurements by maintaining proper positioning of each transducer at the phlebostatic axis, Made of a soft, comfortable material, the platform provides the base for the transducer tab holders and is secured to the patient's arm with an elasticized strap with adjustable hook and loop tabs. The Dale Transducer holder replaces the need to tape transducers on a patient's chest or mount transducers on an IV pole. Once in place, the Dale Transducer Holder eliminates the need for repeated leveling during patient repositioning, transport, or ambulation.

KEY FEATURES

- Stabilizes up to three transducers.
- Improves patient monitoring.
- Quick and easy to apply and remove.
- Saves nursing time.
- Can accommodate VAMP system (Venous Arterial blood Management Protection)
- Not made with natural rubber latex.



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