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Are outdated technologies keeping you from achieving your ideal NICU?

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In recent years, there have been significant advancements in neonatal intensive care (NICU) incubator technology that goes far beyond the standard devices currently used throughout many health systems and hospitals. To address individualized needs of very low birth weight (VLBW) and extremely low birth weight (ELBW) neonates, the technological approach for this patient population had to be reframed to take into consideration their physiological, neurodevelopmental and familial environment. As expectations change, we have to reconsider the tools and technology that we use to meet these new requirements.

While we used to think of incubators as a means to provide warming therapy, they are also the environment in which the infant will spend a critical part of his or her early life. There is comfort in using "tried and true" incubators; yet today's new technology offers significant clinical, workflow and cost benefits.

Below are five considerations when purchasing your next hybrid bed/incubator as you assess clinical care quality, usability within your new standard protocols and financial outcomes for your organization.

1: Neuroprotective care

Providing a neuroprotective environment in the NICU is critical to outcomes, with studies showing improved sleep patterns, increased head circumference and weight at discharge; and reduced nosocomial infections, chronic lung diseases, potential growth failure and co-morbidities. Look for an incubator design with these key features:

- Sound and light monitoring to support neuro NICU guidelines. Ambient lighting protocols that provide cyclical light exposure to reduce stress, improve sleep and encourage development of the circadian rhythm.
- A Kangaroo mode that continually monitors baby's temperature during the skin-to-skin process to ensure they stay within a thermo-neutral zone, while eliminating alarms that could be distracting and disorienting for parents and staff.
- Advanced thermoregulation features that support newly developed protocols for therapeutic hypothermia.
- Incubator and mattress height adjustment that is free of vibrations and provides smooth operation to prevent jarring movements.

2: Family Integrated Care

Family integration is the framework for ensuring that all aspects of developmental care and the care environment are focused on family needs. It can lead to healthier discharges and decreased length of stay, can reduce pain and stress, and can minimize the risk of late onset sepsis. At this same time, it can improve cardiovascular stability and sleep with exclusive breastfeeding; facilitate parental confidence, interaction and bonding; lower readmission rates and improve neurodevelopmental outcomes. Look for an incubator design that offers:

- A family screen feature that allows parents to personalize the incubator screen with their baby's name, graphics and easily understand basic parameters of age, weight and condition. The goal is to humanize the process and provide access to information that makes the parents an integral part of the team.

- Simplify the kangaroo care process to maximize its use by providing low device settings that create a more accessible and comfortable position for family at baby's bedside.
- An integrated audio function that allows parents to play music or a recording of the mother's heartbeat or voice for positive sound stimulation.
- A Kangaroo mode function that bring parents closer to the care process and makes it easier for nurses to monitor progress and capture the time for future quality improvement initiatives.

3: Infection control

Infection prevention is a top priority in every NICU. In older incubator designs, stagnant water in humidification reservoirs can harbor potentially dangerous microbes, increasing risk for infection. Furthermore, outdated incubator designs can include many parts to disassemble, clean and sterilize. Some of these parts have crevices, gaps and seams that are difficult to clean, increasing the risk for stubborn, and potentially dangerous, biofilm formation. Look for an incubator design that features:

- A closed humidification system that utilizes only a small amount of water at a time to generate heat/steam, which prevent waters from pooling at the base of a large reservoir and delivers only sterile water into the baby's environment.
- Fewer contact surface areas and parts to clean, and a flat, smooth design which minimizes places for germs to grow.
- The ability to raise and lower the mattress for access and visibility to help facilitate cleaning under the mattress.

4: Automation and standardization of care

In the NICU, an optimized workflow is essential to attend to all critical interventions in the most efficient and timely fashion. With older incubator designs, many clinical processes require manual nurse intervention, taking time away from other essential tasks. A staff of 120 nurses weaning 50 babies per month can potentially save 350 hours/year through automation – allowing them to allocate their time elsewhere. To optimize workflow, choose an incubator design that features:

- Automated processes for weaning and warm up that can help regulate the baby's temperature as prescribed by your existing protocols, while freeing up the caregiver to attend to other essential tasks.
- Synchronized heat sources that support babies' temperatures before, during and after transition from open and closed modes.
- A function where the incubator recognizes that you are providing cooling therapy as it automatically turns off all heat sources and remains fully functional while keeping the baby in a closed neuro-supportive environment.

5: Cost of care

Imagine how incubators with outdated designs and features procured today will be used by NICU staff members 10 years from now. Patient care technology and protocols evolve quickly and if the incubators used by a hospital are out of date at the time of purchase, it is unlikely they will be able to support standards of care well into the future.

While holding onto a fleet of older incubators or investing in new incubators that meet minimum NICU guidelines and best practices on the surface seems like the most cost-effective solution, be sure to consider the total cost of ownership of these devices. Poor designs require frequent maintenance and can be plagued by recalls; increasing costs, disrupting continuity of care and posing significant risks to babies.

Look for an incubator manufacturer with:

- A proven track record of reliability and durability with its devices.
- Discuss with your Biomedical team the frequency of service, service quality and cost of parts, and also ease of maintenance of these devices. As NICU patient population increases, your need for a fully functional fleet will be the difference between admitting babies or sending them to other facilities around you.
- A high level and long length of experience with incubators and other products for the NICU setting.

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