

# Gravens By Design: New NICU Design Standards are Approved

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The Recommended Standards for Newborn ICU Design has been a guideline for NICU planners and regulators for more than 30 years as NICU design has evolved to keep pace with striking changes in NICU care practices, family engagement, and technology. The 10<sup>th</sup> edition of these standards was recently approved and presented at the Gravens Conference; they will be published in a supplement to the Journal of Perinatology in late 2023.

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The most substantive change to the Standards is the specification of couplet care rooms in NICUs located in hospitals with a delivery service:

**“Any hospital that offers both an obstetrical delivery service and neonatal intensive care shall include an adequate number of couplet care rooms equipped to provide both intensive care for the newborn and postpartum care for the mother in the same room or suite. This requirement does not apply to mothers who require specialized care after delivery, such as treatment for unstable hypertension or respiratory failure, or to infants who require care, such as ECMO or isolation, that cannot be provided in a conventional NICU room.**

**“Rooms to be used for couplet care should be appropriately sized and equipped for care of both the mother and her NICU baby, but depending on the functional program, could also be used for twin newborns, a healthy baby/mother couplet, or a pediatric patient.”**

Many recently-constructed or renovated NICUs have successfully incorporated couplet care rooms into their design with positive results on outcomes and parental satisfaction. This change creates considerable operational challenges that have been successfully addressed, resulting in mothers not being subject-

ed to the trauma of separation from their babies in the critical days immediately after birth.

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The use of color is an essential aspect of good design; research has documented overt and subliminal effects on families and caregivers alike, but this has often been overlooked. The new Standards address this topic:

**“Color choices shall reflect local culture and climate and be modifiable (through colored light and accessory options) when possible.**

**“Color preference is impacted by culture, climate, and length of stay in a space. Ideally, some pieces of the environment are chromatically interchangeable and can be modified by the families or staff.”**

*“Views of nature shall be provided in the unit in at least one space that is accessible to all families and one space that is accessible to all staff. If direct physical access to the outdoors is not available, simulated access to nature shall be provided in at least one space that is accessible to all families and one space that is accessible to all staff.”*

Access to nature is also more clearly specified in the new Standards:

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Standards for the size and specifications of patient and treatment rooms have been updated. For single-family (private) rooms:

**“Each room shall be designed to allow visual and speech privacy for the infant and family, including for skin-to-skin contact, breastfeeding, and pumping.”**

For specialized infant care spaces or rooms:

**“Infant care space designed to accommodate specialized bedside procedures that require additional space for equipment, staff, and other needs shall have a minimum clear floor area of 225 square feet (21 square meters) per infant in multi-bed rooms and 300 square feet (27.9 square meters) in single-bed rooms (e.g., extracorporeal membrane oxygenation, or ECMO, space-intensive bedside surgical procedures that require higher minimum space standards for staff and equipment).”**

For NICU Magnetic Resonance Imaging (MRI) Room:

**Where provided, an in-NICU-specific, self-shielded MRI room shall meet the following minimum requirements:**

- **Room size shall be a minimum of 250 square ft (23.2 square meters)**
- **Floor weight capacity shall be a minimum of 13,000 lbs (5,897 kilograms)**

“Usability testing,” the stage of mockup and simulations following the initial design and prior to preparation of final construction documents, was first introduced to the Standards in the 9<sup>th</sup> edition and updated and expanded for the 10<sup>th</sup> edition. Virtual simulation techniques have become much more refined in the past few years such that repeated, iterative simulations can considerably enhance a single time-intensive and expensive mockup. The updated standard now specifies that all users—including families—should be involved in these simulations and that color and lighting schemes should also be tested.

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Additional articles related to these recommendations and other aspects of NICU design will appear in the upcoming supplement in the Journal of Perinatology to support those planning a major renovation or new construction for their NICU soon. The current

version of the Recommended Standards can be found at <https://nicudesign.nd.edu/>

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