



NICU design

General layout of the unit

Authors

Space for infant, family and staff: Fröst P
Lighting: White R
Acoustic environment: Sizun J
Materials: Bambang Oetomo S
Patient safety: Mohns T

Chair Team: Moen A, Hallberg B

Reviewers: Druart D, Ewald U, Ferrari F,
Garzuly-Rieser T, Kuhn P

Statement of the standard

A NICU is designed to support safety and healing through unrestricted parental presence, use of sensory supportive material and optimal working facilities, promoting close collaboration between families and staff in caring for the ill infant.

Benefits

Short-term benefits:

- Improved medical outcomes
- Minimised separation between infants and parents
- 24/7 skin-to-skin care and improved physiologic stability
- Improved comfort and sleep for infants
- More attractive environment for prolonged presence for parents
- Encouraged parent involvement from the first day since parents can participate in the infant's care, both during intensive care and in a family room
- Supported physical and mental well-being of newborn infants, their families, and the hospital staff by lighting with appropriate intensity, spectrum, location, and diurnal cycling
- Improved family satisfaction
- Enhanced clinician's abilities to perform direct and indirect patient care tasks accurately while minimising visual difficulties
- Reduced length of hospital stay by cycled lighting
- More attractive working environment for healthcare professionals
- Improved nurse satisfaction

Long-term benefits:

- Improved neuro-development
- Facilitated parent-infant interaction and developmental care



For parents and family

- Parents and family are informed by healthcare professionals about principles of the general layout of the unit and are part of the planning process for NICU design.
- Structural barriers to family presence and participation in the care of their infant are avoided.



For healthcare professionals and relevant stakeholders

- The monitoring/workstation are designed so that the patient/family or vital parameters can easily be followed by healthcare professionals while maintaining privacy.



For neonatal unit and hospital

- The principles of the general layout and facilities within a NICU are agreed between planners, hospital, NICU staff, and parent representatives before commencing the planning process.
- The NICU is located in close proximity to the obstetric department to facilitate ease of transportation to the NICU.



Lighting

- Lighting within a NICU are agreed between planners, hospital, NICU staff, and parent representatives before commencing the planning process, including the following principles:
 - Ambient lighting levels in infant spaces are adjustable
 - Separate procedure lighting is mounted at each infant bed
 - Illumination of support areas conforms to published specifications.
- Light sources have an appropriate color spectrum and are positioned in a way that will minimise glare, shadowing, and flicker.
- Switching and dimming options are provided to allow adjustment of lighting levels for utility, comfort, and circadian stimulus.
- Parents have ready access to daylight without having to leave the NICU.



Space for infant, family and staff

- Multiple-bed rooms have a minimal space of 18 m² per patient; single-family rooms have a minimal space of 24 m², taking into account family integrity and privacy and providing at least enough room for:
 - At least one comfortable and reclining chair
 - Hospital bed
 - Lockable wardrobe
 - Easy access to rest-rooms and bathroom
 - Technical equipment
 - Ability for multiple care staff staying in the room at the same time
- The stationary medical equipment is arranged and mounted with flexibility to allow easy transfer of the patient from incubator/cot to parents' chest for skin-to-skin care.
- An additional separate parent sleeping facility including easy access to rest-rooms and shower are located close to the neonatal unit.
- Family facilities including kitchen, laundry room, socialising lounge, and playroom for siblings close to the unit are available.
- A barrier-free room with window for expression is available within the NICU, providing:
 - Sinks with equipment (soap, towel and disinfectant dispenser)
 - Comfortable chairs
 - Tables
- Access to a human milk bank is ensured and a milk preparation room is integrated into the NICU.
- Bereavement space with window and space to stay with the infant after death, including a cooling facility, is provided in a culturally and spiritually appropriate design.
- The spatial organisation of the NICU is decentralised with distributed support spaces, medication, disinfection, and storage etc.
- Free opening dimension to patient room varies between 1600 mm-2000 mm depending on the turning radius of a caregiver's bed and corridor width.
- Private rooms for parent counselling are available on the ward.
- Acoustically separate rooms for professional, administrative and personal needs providing privacy and reducing noise in the NICU.
- Wall colors radiating comfort and homeliness are used adapted to cultural values.



Acoustic environment

- Sound-absorbing materials are used for building or renovating NICUs, e.g. wall and ceiling finishes; floor surface; furnishing; doors; windows.
- Appropriate ventilation, humidification, air conditioning and heating system with high-efficiency particle air (HEPA) filtration taking into account noise levels, is provided.



Patient safety

- In patient rooms, sinks with equipment (soap, towel, and disinfectant dispenser) and space for gloves, disposable apron/smock, visors and surface disinfectants are available. The sink is placed visibly by staff walking routes and with barrier-free access. In addition, equipment for hand disinfection are available at points of care.
- An antechamber/airlock (isolation room) is provided in at least one single-family room. It is equipped with a sink, facilities for hand disinfection, respiratory protection, apron and surface disinfectants and cabinet/shelf for nearby storage of textiles.
- In single-family room units, a high-level central monitoring system including a hand-held distributed alarm management system is implemented.



Materials

- The whole NICU (e.g. wall and ceiling finishes; floor surface; furnishing; doors; windows) is designed so that it is:
 - Easy to clean
 - Can withstand cleaning and disinfection
 - Germ resistant
 - Free of harmful substances



For health service

- A national guideline on the space and layout requirements for a new NICU is available and regularly updated.



european standards of
care for newborn health

Here you can access the full standard: <https://newborn-health-standards.org/layout-nicu/>

EFGONI european foundation for
the care of newborn infants