Infection Control Considerations for NICU Design

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Introduction

Many NICU patients are at high risk for infection because of their illnesses, immature immune systems, and exposure to invasive procedures and devices. The way a NICU is designed can enhance (or interfere with) good infection control precautions, such as hand washing and disposal of soiled items. Consultation with an infection control specialist during the planning stages of a new NICU with regard to both the design itself and the care practices that will be utilized can positively affect outcomes for babies and functionality for staff. Some of the more common issues to be considered in any new design are discussed below as FAQs. Please feel free to add your comments or suggestions in the "Discussion" section.
Does carpeting in the NICU present an infection control risk?

Carpeting has a number of advantages in the NICU, due to its attractiveness, comfort, and sound-reducing capacity. If not properly maintained, however, it can quickly become unattractive and a potential infection hazard.

Proper maintenance of carpeting in the NICU requires a three-level approach.

1. When spills first occur, staff should wipe up as much of the spilled material as possible, as quickly as possible.

2. Within 24 hours, the hospital's housekeeping staff should be available to do “spot cleaning”, and every few months, “deep cleaning” must be done. This generally requires evacuation of the area to be cleaned due to the fumes released by the cleaning materials, so it is usually not possible to deep-clean large areas of the NICU simultaneously.

3. Daily vacuuming is usually necessary as well. Special devices, which are very quiet, are available for this purpose (see www.nd.edu/~kkolberg/Vacuum.htm for details), and some NICUs have installed central vacuum systems.

The initial planning process is very important if carpet is being considered, in order to minimize infection control concerns. Carpeting should not be placed in isolation rooms, clean utility rooms, around sinks, or anyplace where spills are common. Hospital-grade carpet must be used, and chosen for the greatest durability and ease of cleaning. Carpet squares have been successfully used in some NICUs in order to make replacement of stained areas easier. A plan for proper flushing of IV solutions through tubing when a new bag is hung needs to be in place, since one very common source of staining is the draining of IV fluid onto the carpet.

When properly designed, installed, and maintained, carpeting does not pose an increased risk of infection in the NICU, confirmed through nearly two decades of extensive use in many hospitals. Nevertheless, carpeting should not be installed in an NICU unless the precautions mentioned above are carefully planned and implemented.
What are the pros and cons of built-in trash and soiled linen receptacles?

Built-in receptacles are more attractive and less likely to interfere with traffic flow, but can be difficult to empty and very hard to clean if they become soiled. Some NICUs have used receptacles on a track system, which makes them easy to pull out or push back into a recessed area. This solution avoids most of the drawbacks, but requires a sturdy track system and consumes at least twice the space of freestanding receptacles because both the recessed and extended position must be committed to the receptacle.
What is the best design for hand washing sinks?

Hand washing sinks should be large (The Recommended Standards for Newborn ICU Design suggest at least 24 inches wide x 16 inches front to back, and at least 10 inches deep) and freestanding, with hands-free controls. Even with large sinks, splashing is a problem, so the wall behind and floor around the sink should be covered with material that is easily cleaned and resistant to staining. Porcelain sinks are quieter and tend to be more attractive than stainless steel. Space for soap and towel dispensers and trash receptacles should be carefully planned to be easily accessible yet out of general traffic flow. At least some sinks should be handicapped- and child-accessible.

The CDC has recently released their "Guidelines for Environmental Infection Control in Health Care Facilities". This document has plenty of useful information for those planning new construction or renovation, and can be accessed at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm

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