

PREVENTION AND CONTROL OF INFECTIONS IN THE NURSERY AND NEONATAL INTENSIVE CARE UNITS

MARY ANN BUNYI, MD*

Physicians who treat neonates know so well how easily these special group of patients can acquire a nosocomial infection. The American Academy of Pediatrics states that "each neonate should be approached as though he or she harbored colonies of unique flora that should not be transmitted to any other neonate."¹ Therefore, policies for prevention and control of infections in the nurseries should consider each infant as a potential source and recipient of microorganisms.

The Section of Neonatology of the Philippine Pediatric Society has adapted the following universal precautions in the control and prevention of infections:

1. Handwashing remains to be the single most important routine in the control of infection therefore, it is necessary after handling blood, body fluid, secretions, excretions, contaminated items; in between patient contacts and when otherwise indicated to avoid transfer of microorganisms to other patients or environment.
2. Gloves should be worn when touching blood, body fluids, secretions, excretions and contaminated items. Clean gloves should be used before touching mucous membranes and non-intact skin. It should be promptly removed after use, before touching non-contaminated items and environmental surfaces, and before going to another patient.
3. Ideally, masks, eye protection and face shields should be worn to protect mucous membranes of eyes, nose, and mouth during procedures and patient care activities likely to generate splashes or sprays of blood, etc.
4. Wearing of non-sterile gowns will protect skin and prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood.
5. Patient care equipment that has been used should be handled in a manner that will prevent skin and mucous membrane exposures and contamination of clothings.
6. Linens with blood and body fluids, etc. should be handled and transported carefully to avoid exposure and contamination of clothing.
7. Blood-borne pathogens exposure should be avoided by taking all precautions to prevent injuries when using, cleaning and disposing needles, scalpels, and other sharp instruments and devices.
8. Mouthpieces, resuscitation bags, and other ventilation devices should be readily available in all patient care areas and used instead of mouth to mouth resuscitation. If mouth to mouth resuscitation is unavoidable, a trap should be placed in the line.

When patients are documented or suspected of being infected with pathogens, other precautions in addition to the standard precautions are necessary to interrupt transmission.

When a microorganism can be widely dispersed by air currents, inhaled by or deposited on a susceptible host within the same room or long distance from the source patient, it is considered airborne. Specific recommendations for halting such type of transmission include:

- a. private room (isolation room) preferred
- b. masks, gowns, and gloves at all times

In our setting, this precaution is most relevant for babies born of mothers with active varicella and those with active tuberculosis.

The most important route of transmitting microbes in the nursery is by contact, either direct physical contact with an infected or colonized person, or more often, transfer from one infant to another on the hands of personnel². Various gram negative bacilli and *Staphylococcus aureus* can be transmitted via this route. Separate isolation rooms are actually not necessary provided the following conditions are met:

1. sufficient space available for a 4-6 feet aisle or area between newborn infant stations;
2. adequate number of sinks for handwashing in each nursery room preferably one sink for every 6-8

*Philippine Children's Medical Center

- patients in a normal newborn nursery and one sink for every 3-4 patients in the intensive care unit;
3. continuing personnel education about the mode of transmission of such infections.

Specific recommendations for the control of contact transmitted infections include:

- a. private room preferred, cohorting of patients permissible;
- b. gloves at all times;
- c. handwashing with an antimicrobial agent after glove removal and,
- d. gown at all times

It is also important that employees understand the risks of spreading contagious diseases to newborns. It is impossible to pull out all persons with communicable disease from the nursery. Decisions should be made on a case to case basis taking into account the mode of transmission of the infected and the ability of the person to comply with the preventive measures. Health standards for personnel were enumerated by the Neonatology Section³ as follows:

1. Nursery personnel should be free of transmissible infectious diseases
2. Written policies and procedures for assessing health of personnel to include:
 - a. annual chest x-ray
 - b. immunizations against rubella, varicella, HBV
3. Reporting of respiratory, cutaneous, mucocutaneous or GI infections is necessary. Staff may be assigned to areas not requiring direct patient care.
4. Avoid movement of personnel assigned in nursery to other areas of the hospital.
5. Establish employee education on isolation precautions and other proper infection control techniques.

The requirement for a dress code for personnel entering the nursery unit has caused so much controversy yet this ritual has been in existence for quite some time now because it can be easily monitored and

compliance is usually good. In the Standards of Newborn Care, guidelines for dress code include:

1. Establishing policy by each hospital for regular and part-time personnel who enter the nursery area.
2. Optional use of cover gowns for regular personnel in the nursery or NICU for as long as handwashing standards are really enforced.
3. Wearing of long-sleeved gowns over the clothing when handling the neonate outside the bassinet; ideally to be maintained for exclusive care of the neonate.
4. Wearing of caps, masks, and sterile gowns during certain surgical procedures, including umbilical vein catheterization. Long hair should be restrained. Masks should be worn to cover both nose and mouth and discarded after they are removed.
5. Wearing of sterile gloves during deliveries and all invasive procedures.

The role of the environment in nosocomial infections cannot be ignored. Guidelines for cleaning and disinfecting equipments as well as non-critical surfaces are necessary. Equipments used such as face masks, resuscitators, respiratory tubings and other items which get in direct contact with neonates should be cleansed thoroughly to remove any blood, secretion or residue before sterilization and disinfection. Surfaces such as cabinet counters, work tables and similar horizontal surfaces are recommended to be cleaned once a day and between patient care with a disinfectant detergent and clean cloths. Good reservoirs of nosocomial pathogens like windows, walls and storage shelves should be scrubbed periodically with disinfectant detergent solution. Sinks should be scrubbed clean everyday. These 2 special units, nursery and NICU, should be cleaned daily and when traffic is minimal.

There is still so much to accomplish if we want these standards to be achieved. Strict adherence to these measures will always be a challenge. The success of this endeavor will only be evident on the day we can truly say that we can prevent a premature infant from developing a nosocomial infection.

REFERENCES

1. American Academy of Pediatrics and American College of Obstetricians and Gynecologists. Infection Control. In: guidelines for perinatal care. 4th edition. Elk Grove Village, IL: American Academy of Pediatrics, 1997.
2. Moore, Dorothy. Nosocomial Infections in Newborn Nurseries and Neonatal Intensive Care Units. In: Hospital Epidemiology and Infection Control by Mayhall, C.G. 2nd edition, 1999, pp. 665-686.
3. Standards of Newborn Care. Section of Neonatology of the Philippine Pediatric Society, Inc. 2nd edition, 2001. pp. 94-105.