

GUIDELINES FOR HOSPITALS WITH NEONATAL INTENSIVE CARE SERVICE : REGULATION 4 OF THE PRIVATE HOSPITALS AND MEDICAL CLINICS REGULATIONS [CAP 248, Rg 1]

I Introduction

1. These Guidelines serve as a guide to hospital management in the provision of Neonatal Intensive Care, a specialised service listed in the Second Schedule of the Private Hospitals and Medical Clinics Regulations. Hospitals are required to obtain prior approval from the Director of Medical Services before commencement of the specialised service.
2. The guidelines set out the standards required of the hospital to ensure that a high standard of neonatal care at all levels continues to be provided in its Neonatal Intensive Care Units (NICU).
3. The Guidelines are applicable to Level 2 and Level 3 neonatal care. Level 2 and Level 3 neonatal care refer to neonates requiring special and intensive care respectively. Level 1 neonatal care which is defined as normal general neonatal care, is excluded from these guidelines. The definitions for Level 1, 2 and 3 and examples of these levels of neonatal care are at ANNEX I.
4. The ultimate responsibility for the admission and the care of each neonate in the Neonatal Intensive Care Unit lies with the doctor appointed by the hospital to be in charge of the NICU. **In the case where a neonatal advisory committee, instead of a doctor, has been appointed by the hospital to be in charge of the NICU, the individual attending doctors will be responsible for the neonates under their care.**

II Personnel

Doctor in charge of NICU

5. (a) The Neonatal Intensive Care Unit shall be under the charge of an accredited paediatrician¹ who has the necessary training and experience in neonatal intensive care² or its equivalent,

OR

(b) The hospital may appoint a neonatal advisory committee (which shall include an accredited paediatrician¹) to establish, maintain and enforce standards for professional work in the NICU and standards of competency for doctors, nurses and all staff involved in neonatal care.

¹ Accredited by the Specialist Accreditation Board

² At least 2 years of training in neonatology during Advanced Paediatric Training.

6. The doctor in charge shall be responsible for the establishment and maintenance of the standards of care, planning and development of all services and educational activities of the NICU.
7. The hospital must ensure that there is an accredited paediatrician, adequately trained and competent in neonatal intensive care, on call at all times to provide coverage in the event that the primary physician in charge of the respective neonates is unavailable for any reason.
8. The hospital must ensure that there is at least one resident doctor at all times on the premises and immediately available to deal with all emergencies in the NICU. Such resident doctors shall be certified by the hospital as adequately trained in neonatal intensive care, including resuscitation of the newborn.
9. Doctors who perform specialised surgical procedures in the NICUs must be credentialled by the hospital to perform such surgical procedures.

Nurses

10. The nursing care shall be supervised at all times by registered nurses who have the relevant training and experience in the nursing of high-risk infants.
11. The hospital shall ensure that the following requirements for nurse staffing in NICUs are maintained:
 - i. At least 60% of the total nursing complement working in the NICU shall be registered nurses.

Level 3

- ii. The minimum ratio of nurse to baby shall be 1 : 0.5.
- iii. At least 50% of registered nurses on duty each shift shall have the relevant training³ in neonatal care.

Level 2

- iv. The minimum nurse to baby ratio shall be 1 : 1.1.
- v. There shall be at least one registered nurse with the relevant training³ on duty at all times.

Patients

12. An admitting paediatrician is designated to be responsible for each neonate admitted to the NICU.

³ Refers to training in neonatal / paediatric / intensive nursing (formal and in-house training programmes).

13. Opportunities shall be provided for parental participation in the NICU in the care of their infant, as the infant's condition permits. Hospital visiting policies shall reflect the principle of reducing parent / infant separation.

III Facilities

14. The NICU shall only be used for the care of high-risk newborn infants.
15. There shall be adequate work space for each NICU cot or bed.
16. The number of Level 2 cots to be provided by the hospital shall be at least 2 to 2.5 per 1000 live births per year born in the hospital, and the number of Level 3 cots shall be at least 0.5 per 1000 live births per year born in the hospital.
17. *For hospitals that are dealing with high-risk pregnancies and infants, which include those accepting in-utero transfer and neonates born outside of the hospital, the number of Level 2 cots shall be at least 3.5 to 4 per 1000 live births per year born in the hospital, and the number of Level 3 cots shall be at least 1.5 to 2 per 1000 live births per year born in the hospital.*
18. The hospital shall ensure that their radiographers are familiar with Xray techniques to be used with newborn infants so that repetitive exposures are minimised. Gonadal shields shall be used as appropriate.
19. Neonates in the NICU may only be transferred to other hospitals after consultation between the referring paediatrician and the receiving paediatrician has taken place, and agreement on the transfer is made. The management of the referring hospital shall be kept informed of all such arrangements. The referring paediatrician shall ensure that the neonate is appropriately stabilised and adequately managed before and during the transfer.
20. The referring hospital must ensure the safe transfer of the neonate, including arrangements for transport, accompanied by the necessary personnel and facilities for the transfer and reception of the neonate by the receiving hospital. The referring hospital must ensure that there are adequate and appropriate provisions for the safe transport of the neonate, which shall include but not be limited to, the provision of transport incubator, emergency resuscitation equipment, sufficient oxygen supply, ventilator and means of administration of drugs, and equipment for the monitoring and maintenance of vital functions such as body temperature, heart rate, respiratory rate, and blood pressure of the neonate during the transfer.

IV Equipment

21. The hospital shall ensure that there are sufficient numbers of necessary equipment as listed in ANNEX II to cater to the total number of patients in the NICU.
22. Equipment used to monitor vital functions must have an alarm system that is operative at all times.
23. All life support and monitoring equipment shall be connected to an uninterruptable electrical supply source.

V Quality Assurance

24. There shall be documented indications on the criteria for admission of all neonates to the NICU.
25. The NICU shall have a written Quality Assurance (QA) Programme, and regular reports of such QA activities shall be made available to the Director of Medical Services as and when required. The QA Programme shall include documented regular audit on the indications for admission of all neonates to the NICU.
26. Policies and procedures related to the safe conduct of all patient care activities shall be developed, documented and implemented, and in accordance with all MOH requirements.
27. Infection Control is one of the prime areas of quality assurance in a NICU, and shall be strongly emphasised in the Quality Assurance Programme.
28. At the Emergency Department, hospitals with NICUs must ensure that there are clear guidelines for the management and referral of severely ill neonatal cases that may require admission to the NICU. The Accident and Emergency Department shall be equipped to perform neonatal resuscitation.

DEFINITIONS OF NEONATAL CARE**I NORMAL NEONATAL CARE (LEVEL 1)**

This is care given, usually, by the mother in a postnatal ward, supervised by the nurse and doctor but requiring minimal medical or nursing advice.

II SPECIAL CARE NURSERY (LEVEL 2)

Care given in a special care nursery which provides observation, treatment and monitoring falling short of intensive care but exceeding normal routine care.

III INTENSIVE NEONATAL CARE UNIT (LEVEL 3)

Care given in an intensive care nursery for seriously ill neonates who require intensive skilled management by nursing and medical staff.

SOME EXAMPLES OF LEVELS OF NEONATAL CARE**I NORMAL NEONATAL CARE (LEVEL 1)**

Babies with mild medical conditions who can be observed in Level 1 neonatal care include babies with G6PD deficiency, babies of Hepatitis B carrier mothers, babies with mild congenital malformations (eg. polydactyly, pre-auricular tags, hydrocele etc) and babies receiving phototherapy, at the discretion of the specialist in charge. Babies born to mothers with maternal complications like diabetes mellitus, pyrexia, prolonged rupture of membrane, mild meconium staining, but who are free from all clinical manifestations of illnesses are also included. The emphasis is to provide mothercraft and the encouragement of breastfeeding.

II SPECIAL CARE NURSERY (LEVEL 2)

- a. All low birth weight infants 2000g and below⁴
- b. All preterm deliveries 35 weeks and below
- c. Neonates with Apgar Score of 4 to 6 at five minutes, and/or requiring any form of resuscitation at birth.

⁴ For II(a) & II(b), infants weighing less than 1250g or preterm deliveries below 30 weeks or under should be under level 3 neonatal intensive care. Infants of higher weights and gestational ages should be directed to level 2 or level 3 at the discretion of the specialist on duty.

- d. Babies who require continuous monitoring of respiration or heart rates by apnoea monitor, pulse oximeter, or by transcutaneous monitors.
- e. Babies who are receiving additional oxygen.
- f. Babies who are receiving intravenous glucose, electrolyte solutions, antibiotics.
- g. Babies who are being tube fed.
- h. Babies who are being barrier-nursed.
- i. Babies receiving phototherapy, at the discretion of doctor in charge.
- j. Babies with persistent hypothermia of 36⁰ C and below.
- k. Babies with congenital malformations that require special care.
- l. Babies who have had minor surgery in the previous 24 hours.
- m. Babies requiring special monitoring other than those mentioned in the examples given of Normal Neonatal Care (level 1) above.

III NEONATAL INTENSIVE CARE UNIT (LEVEL 3)

All babies at this level require continuous monitoring of respiration or heart rates by apnoea monitor, pulse oximeter, or by transcutaneous monitors.

- a. Critically ill babies receiving assisted ventilation, viz. Intermittent Mandatory Ventilation (IMV), Constant Positive Airway Pressure (CPAP), and in the first 24 hours following its withdrawal.
- b. Critically ill babies, including those with recurrent apnoea requiring constant attention.
- c. Babies who have had major surgery eg PDA ligation or other surgical conditions as requested by the Paediatric Surgeon.
- d. Babies with severe perinatal asphyxia (Apgar Score of 3 or less at five minutes).
- e. Severe meconium aspiration syndrome.
- f. Infants weighing less than 1250 gms or preterm deliveries below 30 weeks or under should be under level 3 neonatal intensive care. Infants of higher birth weights and gestational ages should

be directed to level 2 or level 3 at the discretion of the specialist in charge.

- g. Babies with convulsions.
- h. Babies receiving partial or total parenteral nutrition.
- i. Babies undergoing major medical procedures, such as arterial catheterisation, peritoneal dialysis or exchange transfusions.

EQUIPMENT RECOMMENDED FOR DIFFERENT LEVELS OF NEONATAL INTENSIVE CARE**A SPECIAL CARE NURSERY (LEVEL 2)**

The following equipment are recommended for babies under special care:

- incubator or cot adequate for temperature control
- ambient oxygen analyser
- apnoea alarm
- heart rate monitor
- infusion pump
- phototherapy unit
- access to frequent blood gas analysis using micromethods
- access to biochemical analysis using micromethods
- access to equipment for radiological examination

B NEONATAL INTENSIVE CARE UNIT (LEVEL 3)

The following equipment are recommended for care of the critically ill :

- intensive care incubator or unit with overhead heating
- respiratory or apnoea monitor
- heart rate monitor
- intravascular blood pressure transducer or surface blood pressure recorder
- transcutaneous pO₂ monitor or intravascular oxygen transducer
- transcutaneous pCO₂ monitor
- syringe pumps

- infusion pumps
- ventilator
- continuous temperature monitor
- pulse oximeter
- phototherapy unit
- ambient oxygen monitor
- facilities for frequent blood gas analyses using micromethods
- facilities for frequent biochemical analyses including glucose, bilirubin and electrolytes by micromethods
- access to ultrasound equipment for visualization of organs such as the brain
- access to equipment for radiological examination

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