

Minimal standards of neonatal care in hospitals

A POLICY STATEMENT BY THE PAEDIATRIC SOCIETY OF PAPUA NEW GUINEA

Compiled and accepted by the Paediatric Society of Papua New Guinea in September 1999 for implementation by the Department of Health and hospitals throughout Papua New Guinea

Introduction

In Papua New Guinea the infant mortality rate is 77-80/1000 livebirths; this has not changed for a decade. The mortality rate for children up to the age of 5 years is about 120/1000 livebirths. 35-40% of this total child mortality occurs in the first 28 days, making the neonatal period the most hazardous time of life. To help reduce neonatal mortality, the Paediatric Society proposed standardization of Neonatal Units (Special Care Nurseries) throughout the country. Neonatal Units should be managed by paediatricians and should focus on lowering in-hospital neonatal mortality from the common causes (prematurity and intrauterine growth restriction, serious bacterial infections, birth asphyxia and aspiration syndromes). Efforts at reducing neonatal mortality should reflect available resources and appropriate technology. For example, it makes no sense to introduce mechanical ventilation for babies less than 1 kg while the mortality for babies weighing 1-2 kg (numerically a much larger group with better prospects for survival) remains excessive and when the latter could be tackled with far simpler means and technology.

Improving in-hospital neonatal care should be directed towards the following:

- 1 Rational use of oxygen
- 2 Detecting and treating apnoea
- 3 Maintaining a stable temperature within the normal range
- 4 Preventing, detecting and treating hypoglycaemia
- 5 Ward organization to ensure close observation of the most critically ill babies
- 6 Safe use of intravenous fluids in selected critically ill neonates

- 7 Evidence-based use of antibiotics
- 8 Prevention of nosocomial sepsis
- 9 Auditing of practice
- 10 Training of nurses in neonatal care.

Efforts to standardize and improve in-hospital neonatal care should not detract from the fact that in most parts of the country most of the neonatal mortality occurs outside hospitals. Lowering in-hospital mortality will result in, at best, a modest reduction in overall neonatal mortality. Major efforts must be made to reduce the risk factors for neonatal illness and to provide better antenatal, perinatal and neonatal services within communities. Attracting more pregnant women to services that already exist and making services more 'mother-friendly' will be essential to reducing the overall high neonatal and maternal mortality.

Levels of Neonatal Units

Depending on the size of a hospital, its manpower and the population it caters for, hospitals have been categorized into three levels for provision of neonatal care. Examples of the three levels follow:

- | | |
|-------------------------------|---|
| Level 3: Tertiary Hospital | Port Moresby General Hospital (PMGH) |
| Level 2: Regional Hospitals | ANGAU Memorial Hospital, Lae
Goroka Base Hospital
Mt Hagen Base Hospital
Nonga Base Hospital, Rabaul |
| Level 1: Provincial Hospitals | Popondetta Hospital etc |

Level 3: Port Moresby General Hospital

Port Moresby General Hospital's labour ward delivers over 9000 women a year. This is increasing each year with the increasing population of the nation's capital. From these deliveries 950-1000 babies require admission to the Neonatal Unit annually. A further 200-300 babies require neonatal care from the postnatal ward. The in-hospital neonatal and perinatal rates for PMGH are currently about 10/1000 and 30/1000, respectively. 13% of neonates have a birthweight below 2500 g and 5% have a birthweight <1000 g.

Essential requirements

1 Personnel

Medical

Paediatrician
Paediatric registrar (full-time)
1-2 Paediatric residents (full-time)

Nursing

12 Nursing officers of whom 8 should be a trained paediatric nurse or midwife
10-12 Nurse aides or community health workers (CHWs)

Support

1 clerk (full-time)
1 cleaner

2 Space

An extension of the current Neonatal Unit is required to meet the requirements of the rapidly expanding population. There should be ample space made available for 20 acute care cots, 8 infectious room cots and 34 mothers' beds, which will be used by mothers and their growing babies. The rooms should be well lit with both natural and artificial lighting. The Neonatal Unit should be clean and well ventilated and located in close proximity to the labour and postnatal wards. There should be clean running water.

3 Equipment

Labour Ward

Neonatal resuscitation trolley including overhead heater and portable oxygen cylinder
Suction machine
Wall oxygen outlet – 2
Endotracheal tubes (sizes 2.0, 2.5, 3.0 and 3.5F)
Neonatal laryngoscope
Neonatal bag and mask
Weighing scale (beam balance)

Operating theatres

Neonatal resuscitation trolley with overhead heater, portable oxygen cylinder and suction apparatus
Cord clamps
Wall oxygen outlet
Endotracheal tubes
Neonatal laryngoscope
Neonatal bag and mask

Nursery

Neonatal resuscitation trolley including overhead heater
Neonatal laryngoscope – 2
Neonatal bag and mask – 2
Endotracheal tubes
Apnoea monitor – 6
Suction machine – 2
Weighing scale (beam balance)
Wall oxygen outlet – 8 to 10
Pulse oximeter
Infusion pumps: IVAC – 8
syringe – 6
Hand electric dryer
Phototherapy units – 8
Electric blankets – 10
Incubator (optional)
Nasal CPAP machine

Postnatal Ward

Neonatal resuscitation trolley with overhead heater, portable oxygen cylinder and suction apparatus
Suction machine
Weighing scale (beam balance)
Wall oxygen outlet
Electric hand dryer
Phototherapy units – 4

Level 2: Regional Hospitals

Base Hospitals in rural PNG admit about 500-600 sick neonates annually. Many of the sick neonates admitted are born outside hospital. To provide the minimum requirement of care the following must be met.

Essential requirements

1 Personnel

Medical

- Paediatrician
- Paediatric registrar (with other paediatric duties)
- Paediatric resident

Nursing

- 6-8 Nurses with 3 (1 per shift) a trained paediatric nurse or midwife
- 6-8 Nurse aides or CHWs

2 Space

A neonatal room with ample space for 10-12 cots. 2 or 3 cots should be resuscitation trolleys with overhead heaters, oxygen and suction. The room should be well lit with both natural and artificial light and be well ventilated and clean. There should be clean running water. An adjacent room should have ample space for 12-16 *Susu Mama* beds.

3 Equipment

Labour Ward

- Neonatal resuscitation trolley with overhead heater, portable oxygen cylinder and suction apparatus
- Suction machine
- Endotracheal tubes
- Neonatal laryngoscope
- Neonatal bag and mask

Nursery

- Neonatal resuscitation trolley with overhead heater, oxygen and suction – 2 to 3
- Neonatal laryngoscope

- Neonatal bag and mask
- Endotracheal tubes
- Suction machine
- Weighing scale (beam balance)
- Apnoea monitors – 4
- Wall oxygen outlets or portable oxygen cylinders – 6 to 8
- Pulse oximeter
- Heaters, especially for the highlands hospitals
- Electric hand dryer
- Phototherapy units (servicing 2-3 cots)
- Electric blankets – 4
- Incubators – optional, 1-2

Level 1: Provincial Hospitals

Each Provincial Hospital may admit between 150-200 sick neonates annually.

Essential requirements

1 Personnel

Medical

- Paediatrician
- Service registrar

Nursing

- 5-6 Nurses with 2 trained as paediatric nurses or midwives
- 5-6 Nurse aides or CHWs

2 Space

A neonatal room with space to fit 4 cots. The room should be well ventilated and clean, with adequate natural and artificial light and clean running water. There should be an adjacent room with ample space for 4 *Susu Mama* beds.

3 Equipment

Labour Ward

- Neonatal resuscitation trolley including overhead heater, portable oxygen cylinder and suction apparatus – 2
- Suction machine
- Endotracheal tubes
- Neonatal laryngoscope
- Neonatal bag and mask

Nursery

Neonatal resuscitation trolley with
overhead heater, oxygen and suction
Neonatal laryngoscope
Neonatal bag and mask
Endotracheal tubes
Weighing scale (beam balance)
Apnoea monitor
Oxygen for 2 cots (wall outlets or
portable cylinders)
Pulse oximeter
Heater
Electric hand dryer
Phototherapy unit
Electric blankets – 2

Consumable items

The following other essential consumable items are required at all levels:

- 1 Blood glucose testing strips
- 2 Intravenous equipment
 - Fluids
 - Paediatric (100 ml) burettes
 - Intravenous cannulae (22 and 24 gauge)
 - Scalp vein needles (25 gauge)
 - Syringes and attachments for syringe pumps
(if relevant to the level of care)
- 3 Catheters
 - Feeding catheters (sizes 5 and 8)
 - Oxygen catheters (sizes 5 and 8)
 - Suction catheters
- 4 Parenteral drugs (see also the neonatal drug section of the standard treatment book)
 - Benzylpenicillin, gentamicin and flucloxacillin
 - Aminophylline
 - Phenobarbitone and paraldehyde
 - 50% dextrose

Conclusions

Standardization and better organization of neonatal units, training of paediatric and midwifery nursing staff as experts in neonatal care and the graded introduction of relatively low-level technology will reduce the high neonatal mortality in hospitals. Much greater effort must be put into cost-effective strategies for reducing neonatal and maternal mortality that occurs outside hospitals. Standardization of neonatal care in health centres and at aid posts, and training of primary health workers in neonatal care would be a start. Training of village-based lay health workers in the recognition and primary care of sick neonates may also be useful, and requires formal assessment of benefit.

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