

**RECOMMENDATIONS
FOR CREATION OF
MODEST LEVEL II
NEONATAL CARE
FACILITIES IN INDIA**

Meharban Singh

The Need

During the past two decades, infant mortality rate has been brought down to 95 per 1000 births but unfortunately, there has been no significant change in the perinatal mortality rate in the country which is hovering around 60 per 1000. The infant mortality has been reduced by appropriate national strategies aimed at postneonatal infants. At present over 60% of all infant deaths occur among newborn babies. In order to achieve further reduction in infant mortality in the country, it is mandatory to enhance neonatal survival by specific programmes and strategies targetted for newborn survival. It is well known that improved neonatal survival is mandatory for effective fertility control because frequent

perinatal losses are associated with frequent pregnancies leading to the birth of high risk preterm and low birth weight babies and consequent deleterious effects on the health of the mother. The available infrastructure for provision of neonatal care in the community is not functioning optimally because of unsatisfactory referral system. It is obvious that referral system cannot function with any credibility unless efficient neonatal care facilities are created at Community Health Centres, District Hospitals, State Teaching and Non Teaching Hospitals. There is thus an urgent need to establish at least modest type of Level II neonatal care facilities in these hospitals in the country.

Facilities Required

The neonatal survival can be enhanced by ensuring safe delivery and creating optimal facilities for resuscitation at birth. The provision of warmth, prevention of infections by ensuring asepsis and provision of adequate nutrition by promoting feeding with human milk are all of fundamental importance. The availability of water supply round-the-clock and plenty of disposables are essential for prevention of bacterial infections which are a leading cause of neonatal mortality in our country. Simple monitoring devices to monitor heart-rate, respiration, bradycardia/apnea and ambient oxygen concentration are essential for optimal management of high risk babies. Minimal laboratory facilities should be established for taking portable skiagrams and for estimation of hemogram, micro-hematocrit, glucose (dextrostix) and bilirubin with the help of bilirubinometer.

From the Department of Pediatrics, All India Institute of Medical Sciences, New Delhi 110 029.

Reprint requests: Dr. Meharban Singh, Professor and Head, Department of Pediatrics, All India Institute of Medical Sciences, New Delhi 110 029.

Services to be Established

It is desirable to establish at least 10-bedded Special Care Neonatal Unit in every hospital catering to about 2000 to 3000 deliveries per year. Facilities should be created to provide expert neonatal care to all babies weighing more than 1200 g or with a gestational maturity of more than 30 weeks. There should be optimal infrastructure for providing thermoneutral environment, facilities for administration of oxygen with ease and safety, administration of intravenous infusions, blood and blood products and drugs, *etc.* with the help of at least microburette sets. Facilities should be created for management of newborn babies with pathological jaundice with the help of phototherapy and exchange blood transfusion. Short term mechanical ventilation facilities with bag and mask or bag and endotracheal tube and CPAP facilities with an improvised indigenous system should be available for management of severely asphyxiated babies and infants with mild respiratory distress syndrome or recurrent apneic attacks.

Physical Infrastructure

Adequate and abundant space, specially trained and skilled nurses, and availability of basic tools and equipments are fundamental pre-requisites for providing optimal neonatal care.

The special care nursery should be located adjacent to the delivery area and obstetrical operation theatre. The main nursery should comprise of two large rooms (catering to 5 cribs each) to provide intermediate care facilities to 10 babies @ 50 sq. feet area per baby. In addition, space should be available for hand washing and scrubbing before entering the nursery, isolation room with two cribs, feeding room for promotion of breast feeding and

expression of breast milk and a nursing station. Avoidance of over-crowding and congestion is of paramount importance to reduce nosocomial infections. The nursery should preferably be air conditioned as use of desert coolers and fans is not recommended. In winter ambient temperature should be raised ($29 \pm 2^\circ\text{C}$) by use of radiant heaters. Apart from round-the-clock running water facilities, the nursery complex should be provided with a large number of electrical outlets. Each room should be provided with wash basins with elbow taps and waste baskets with plastic hampers for disposal of soiled linen, cotton swabs, infusion sets, *etc.* The walls of the nursery should be made of ceramic tiles and floor should be covered with vinyl tiles for easy and effective washing to maintain asepsis. The walls should be provided with open cupboards for stocking drugs, disposables and equipments.

Equipments

The delivery room should be provided with a resuscitation trolley or table located in a corner which is kept warm with the help of a radiant heater. There should be enough Ambu bags, laryngoscopes, endotracheal tubes, suction catheters and deLee suction traps, *etc.* It should be provided with a foot operated or electrical suction machine and oxygen cylinders.

The detailed equipments required in the nursery are listed in the *Table*. Angle-poise lamps with 200 watt bulbs placed about 2 to 3 feet above the cot can be used for keeping babies warm. The availability of plenty of disposables and promotion of feeding with human milk is essential for reducing nosocomial infections. There should be no provision for bottle feeding with a formula in the nursery. The babies receiving nosogastric feeding should be

weaned to feeding with a spoon and cup before being promoted to direct breast feeding.

The nursery should be provided with a small laboratory for examination of gastric aspirate, hemogram, urine analysis, blood sugar and bilirubin. It should be equipped with a microscope, dextrometer, bilirubinometer and microcentrifuge.

TABLE—Equipments Required for a Level II Neonatal Care Unit Catering to 2000 Deliveries per Year.

S.No.	Item	Quantity
1.	Resuscitation sets complete	2
2.	Incubators	2
3.	Open care system with servo control	2
4.	Bassinets	6
5.	Radiant warmers/heaters	4
6.	Phototherapy units	2
7.	Oxygen head boxes	4
8.	Oxygen analyzers	2
9.	Foot operated suction machines	2
10.	Non-invasive BP monitor	2
11.	Heart-rate apnea monitor	2
12.	Infusion pumps	2
13.	Oxygen saturation monitor	1
14.	Detecto lever type or electronic infant weighing scale	2
15.	Low reading rectal thermometers (30-40°C)	20
16.	Infantometer	1
17.	Refrigerator	1
18.	Plenty of disposables, feeding tubes, suction catheters, medicaths/neoflons, scalp vein sets, microburette sets, umbilical catheters, disposable syringes, needles, etc.	

Staff Requirements

There is a need for dedicated staff especially trained in the field of neonatology. There should be at least two Medical Officers having Postgraduate qualifications in Pediatrics along with 3 to 4 General Duty Medical Officers or Postgraduate students. The success of Special Care Neonatal Unit largely depends on the availability of trained Staff Nurses. Each Nurse should look after 4 babies round-the-clock with additional 25% Nurses to look after exigencies like leave/duty off. There is thus a need for minimum of 8 Staff Nurses to look after a 10-bedded Special Care Neonatal Unit. Additional nursing help in the form of Trainee Nurses or Nursing Aides is useful. One Public Health Nurse, charged with the responsibility of lactation management and social assistance would serve as a useful member of the team. The unit should be provided with 5 Class D Staff to provide round-the-clock coverage by at least one worker for cleaning of nursery, equipments and transport of blood samples and other materials, etc.

Documentation

The unit should be provided with printed stationery for maintaining brief case records, admission and discharge slips, etc. A register should be maintained to record all the relevant details pertaining to babies admitted in the Special Care Neonatal Unit. A manual highlighting house keeping activities and feeding routines of the nursery should be prepared for orientation of nurses and doctors. The detailed policies regarding promotion of breast feeding and avoidance of prelacteal feeds should be laid down for the compliance of pediatric and obstetric staff. There should be a regular perinatal audit review with the obstetric staff to discuss morbidity

and mortality data every month to streamline management protocols and improve cooperation between pediatricians and obstetricians. There should be a provision for inservice training of nurses and doctors working in the district hospitals in an accredited neonatal unit of a teaching hospital for a period of one week every 6 months.

Epilogue

In view of the limited national resources, the requirements of equipment and staff of Community Health Centres and District Hospitals may have to be stepped down during the first phase. However, there should be no compromise on the adequacy of physical infrastructure, aseptic rituals, availability of disposables, maintenance of thermoneutral environ-

ment and promotion of breast feeding. Optimal care of babies at birth, prevention of perinatal hypoxia and prompt management of birth asphyxia are indeed crucial to enhance neonatal survival, reduce neonatal morbidity and improve quality of life among survivors which can be achieved by improving skills of health professionals providing neonatal care. On the other hands, the inputs at the State hospitals and teaching institutions would need to be gradually enhanced so that facilities for mechanical ventilation and total parenteral nutrition can be established. It is recommended that once the neonatal mortality rate has been brought down to 30 per 1000 live births by institution of modest Level II Neonatal Care facilities, the Unit should be upgraded to serve as a Tertiary Neonatal Care Facility or a Regional Perinatal Centre.

NOTES AND NEWS

PEDIATRIC & NEONATAL EMERGENCIES

The book provides clear guidelines for the diagnosis and management of various problems that constitute emergencies. Prompt recognition of emergencies along with their appropriate and adequate initial management is essential to save lives and prevent complications. In a number of situations the doctors cannot do very much and must send the patient to the casualty services of a hospital. One needs to be aware of such conditions. What not to do is also important. Emergencies in the newborn present very different and often unique problems that require special skills and proficiency for their recognition and management. A group of outstanding contributors have presented the various topics in an informative and lucid manner. The book has 58 chapters spread over 500 pages.

Pediatricians and physicians having first contact with emergencies in children as well as those responsible for the subsequent critical and intensive care will find this publication useful. It will be of particular interest for postgraduate students.

The book can be procured from "Indian Pediatrics" at a price of Rs. 150/- for soft cover or Rs. 175/- for hard cover. This price includes postal charges. The entire benefits from the sale of this book will go to the "Indian Pediatrics". Demand drafts only, should be drawn in favour of Indian Pediatrics and mailed to the Editor.