



Section I

2601011

Setting up, Costing and Operational Steps



I.I Newborn care at different levels

In the overall planning of facility based care it is important to understand the level of care that can be provided at the various facility levels. Table 1 summarizes the required newborn care facilities at different levels.

Table 1: Newborn care facilities at different levels

Health Facility	All Newborns at Birth	Sick Newborns
Primary health centre (PHC)/ Sub-centre (SC) identified as MCH Level I	Newborn care corner in labor rooms	Prompt referral
Community health centre (CHC) / First referral unit (FRU) identified as MCH Level II	Newborn care corner in labor rooms and in operation theatre (OT)	Newborn stabilization unit
District hospital identified as MCH Level III	Newborn care corner in labor room and in operation theater	Special newborn care unit (SNCU)

Terminology

Newborn Care Corner (NBCC)

NBCC is a space within the delivery room in any health facility where immediate care is provided to all newborns at birth. This area is MANDATORY for all health facilities where deliveries are conducted.

Newborn Stabilization Unit (NBSU)

NBSU is a facility within or in close proximity of the maternity ward where sick and low birth weight newborns can be cared for during short periods. All FRUs/CHCs¹ need to have a neonatal stabilization unit, in addition to the newborn care corner.

Special Newborn Care Unit (SNCU)

SNCU is a neonatal unit in the vicinity of the labor room which will provide special care (all care except assisted ventilation and major surgery) for sick newborns. Any facility with more than 3,000 deliveries per year should have an SNCU (most district hospitals and some sub-district hospitals would fulfil this criteria).

¹ As per the IPHS

Table 2: Expected services to be provided at newborn care facilities

Newborn Care Corner	Stabilization Unit	Special Newborn Care Unit
Care at birth	Care at birth	Care at birth
<ul style="list-style-type: none"> ● Prevention of infection ● Provision of warmth ● Resuscitation ● Early initiation of breastfeeding ● Weighing the newborn 	<ul style="list-style-type: none"> ● Prevention of infection ● Provision of warmth ● Resuscitation ● Early initiation of breastfeeding ● Weighing the newborn 	<ul style="list-style-type: none"> ● Prevention of infection ● Provision of warmth ● Resuscitation ● Early initiation of breastfeeding ● Weighing the newborn
Care of normal newborn	Care of normal newborn	Care of normal newborn
<ul style="list-style-type: none"> ● Breastfeeding/-feeding support 	<ul style="list-style-type: none"> ● Breastfeeding/-feeding support 	<ul style="list-style-type: none"> ● Breastfeeding/-feeding support
Care of sick newborn	Care of sick newborn	Care of sick newborn
<ul style="list-style-type: none"> ● Identification and prompt referral of 'at risk' and 'sick' newborn 	<ul style="list-style-type: none"> ● Management of low birth weight infants ≥ 1800 g with no other complications ● Phototherapy for newborns with hyper-bilirubinemia* ● Management of newborn sepsis ● Stabilization and referral of sick newborns and those with very low birth weight (rooming in) ● Referral services 	<ul style="list-style-type: none"> ● Managing of low birth weight infants < 1800 g ● Managing all sick newborns (except those requiring mechanical ventilation and major surgical interventions) ● Follow-up of all babies discharged from the unit and high-risk newborns ● Immunization services ● Referral services
Immunization services	Immunization services	Immunization services

* Availability of laboratory facilities to estimate bilirubin levels is a prerequisite

Steps in setting up newborn care facilities

Newborn Care Corner

1. Earmark an area about 20-30 sqft in size within the labor rooms of all health facilities for establishing a newborn corner. For FRUs and district hospitals, also set up newborn corners in operation theatres where caesarean sections are conducted.
2. Equip the corner with a radiant warmer and resuscitation kits (Annexure 1.1, A).

Newborn Stabilization Unit

1. For setting up a 4-bedded stabilization unit, at least 200 sqft of floor space is required. The unit should be located within or in close proximity to the maternity ward.
2. In addition, two beds in the postnatal ward should be dedicated for rooming in.
3. Civil work. Basic civil work required to set up a stabilization unit are:
 - Power supply: The unit should have 24 hr uninterrupted stabilized power supply.

- Water supply: The unit should have 24 hr uninterrupted running water supply.
 - Lighting: The unit should be well lit, preferably with compact fluorescent light (CFL) panels.
 - Floor surfaces: The floor surfaces should be easily cleanable thus minimizing the growth of micro-organisms.
 - Walls: As with floors, the ease of cleaning, durability, and acoustical properties of wall surfaces needs to be considered.
4. Equipment: The equipment for maintaining temperature and conducting resuscitation are required (See Annexure 1.1, B : List of Equipment).

Special Newborn Care Unit

1. Project the bed demand.

The minimum recommended number of beds for an SNCU at the district hospital is 12. However, if the district hospital conducts more than 3,000 deliveries per year, 4 beds should be added for each 1,000 additional deliveries.

2. Estimate the required space and identify the space.
 - a. An average floor area of 50 sqft per bed should be available for a patient care area with an additional 50 sqft to be utilized as ancillary area. Therefore, on an average, a total area of 100 sqft per patient is required. For example, for a 12-bedded SNCU, 1,200 sqft floor area is required.
 - b. Additional space will be required for the step-down area which will have beds for babies rooming-in with the mothers after the acute phase of illness is over. The number of beds (adult beds would be required for rooming-in babies with mothers) is 30% of the SNCU beds. For example, a 12-bedded unit will require 4 additional adult beds for the step down.

3. Design the unit.

The unit should be so designed as to have the following areas:

- a. Patient care area: For a unit of 12 beds, the patient care area would be 600 sqft (50 sqft per bed). The patient care area can be designed to have two interconnected rooms separated by transparent observation windows from the nurses' working place in between. While one room can be used for intramural newborns (those born within the health facility), another room can be used for extramural newborns (those born outside the health facility).
 - b. Ancillary area: 600 sqft ancillary area should include separate areas for hand washing and gowning area at the entrance, nurses' work station, clean area for mixing intravenous fluids and medications, doctors duty room, computer terminal, mother's area for expression of breast milk and learning mother crafts, unit store and side lab. It is desirable to have areas for portable x-ray, boiling and autoclaving and laundry room.
 - c. Step-down area: In addition to the patient care area and ancillary space, the SNCU design should include the step-down unit. The step-down could be within the premises or in close proximity.
4. Identify and provide for civil, electrical and mechanical requirements.

Civil, electrical and mechanical works are essential for effective functioning of SNCU.

- a. Power supply: The unit requires 24 hr uninterrupted stabilized power supply, sufficient to take the load of equipment. Stabilized power is critical to prevent any electrical damage to the equipment. Ensuring stabilized power inputs will require careful planning at the design stage. Power generator of appropriate wattage is needed to provide uninterrupted power supply.
 - b. Floor surfaces: The floor surfaces should be easily cleanable and minimize the growth of micro-organisms.
 - c. Walls: As with floors, the ease of cleaning, durability, and acoustical properties of wall surfaces must be considered.
 - d. Water supply: The unit should have 24 hr uninterrupted running water supply. An overhead tank of appropriate size should be provided for.
 - e. Lighting: Light sources should be as free as possible of glare or veiling reflections. No direct view of the electric light source or sun should be permitted in the newborn space.
 - f. Temperature: The unit should be designed to provide an air temperature of 78.8°F to 82.4°F (28 ± 2°C).
5. Procure and install equipment.

SNCU equipment include equipment for resuscitation, phototherapy and thermoregulation such as radiant warmers and phototherapy units. It is imperative to ensure adherence to the standards. As mentioned above, it is critical to ensure uninterrupted and stabilized power supply before installation (Annexure 1.1, C).

Cost of setting up newborn care facilities

Table 3: Indicative costs for setting up newborn care facilities (in Indian rupees –₹)

	NBCC	NBSU	SNCU
One time establishment cost (in ₹; does not include the cost of training)			
Renovation & civil works (average)	10,000	3,00,000	16,00,000
Equipment & furniture	75,000	2,75,000	25,00,000
SubTotal	85,000	5,75,000	41,00,000
Recurring or running cost (does not include staff salaries)			
Consumables	5,000	25,000	3,50,000
Maintenance cost	15,000	1,50,000	6,50,000
SubTotal	20,000	1,75,000	10,00,000
Total	1,05,000	7,50,000	51,00,000

Human resources for newborn care service

- **NBCC:** One doctor and one staff nurse should be designated to NBCC to ensure appropriate functioning of the corner. All doctors and nurses who are likely to attend deliveries must be trained in *Navjaat Shishu Suraksha Karyakram* (NSSK). If NBCC is established at the sub-centre, then the auxillary nurse midwife (ANM) must also receive NSSK training.
- **NBSU:** One trained doctor is required for the stabilization unit. At least one full-time staff nurse trained in newborn care per shift should be available. This would require at least 4 fulltime staff nurses per unit. The staff at NBSU must be trained in facility based IMNCI (F-IMNCI).
- **SNCU:** A 12-bedded unit (plus 4 beds for the step-down area) requires at least one pediatrician or a trained doctor round-the-clock. Assuming that one doctor provides back-up of 8 hours, at least three to four trained doctors should be available at the facility. It is proposed that one paediatrician trained in neonatology should be posted at the unit, supported by two or three medical officers trained in FBNC.

Such a unit will also require three nurses in each shift, round-the-clock. In addition, there should be sufficient nurses recruited to provide for leave vacancy and contingency.

In addition to doctors and paramedics, dedicated support staff should be available to clean the nursery at least once during every shift and more often depending on the need. In addition, a part-time lab technician and a data operator will be required for the unit.

Note: It is important that doctors and nurses trained in newborn care are retained in SNCU/NBSU/NBCC and are not rotated to duties outside the newborn care facilities.

Training of staff on newborn care

To ensure that the staff has the necessary skills to provide the appropriate level of care, the staff should, at a minimum, undergo training in the following programme areas:

- **NBCC:** Doctors, staff nurses and ANMs working at newborn corners should be trained in NSSK
- **NBSU:** Doctors and nurses at facilities with stabilization units should be trained in F-IMNCI
- **SNCU:** The staff posted at the SNCU need to further undergo training in FBNC

Given below is a brief on each of the trainings proposed for staff at newborn care facilities:

Navjaat Shishu Suraksha Karyakram (NSSK)

Birth asphyxia is among the major direct causes of neonatal deaths, along with preterm birth and severe infections. NSSK is a new programme in basic newborn care and resuscitation that has been rolled out with support from the IAP and NNF. NSSK addresses important interventions of care at birth, that is basic newborn resuscitation, prevention of hypothermia, prevention of infection, early initiation of breast feeding, and equips the staff with appropriate knowledge and skill to provide essential newborn care in primary health care settings.

A two-day training module for medical officers, staff nurses and ANMs at primary health facilities (24x7 PHCs, sub-centres identified at MCH centres) has been developed.

NSSK is recommended as an essential training for all health workers conducting deliveries at 24x7 PHCs and sub-centres identified as MCH centres.

The specific details are as follows:

Training	Navjaat Shishu Suraksha Karyakram (NSSK)
Venue	District hospital or medical colleges
Trainers	Paediatricians from medical colleges and district hospitals
Trainees	Medical officers, staff nurses and ANMs
Batch Size	32 per batch
Duration	2 days

Facility based IMNCI (F-IMNCI)

Capacity building of service providers at NBSUs is essential to ensure quality care for normal and sick newborns. Keeping in view the non-availability of specialists (paediatricians) at many FRUs, it becomes important to build skills of medical officers and staff nurses at these facilities. It is recommended that all NBSU staff at FRUs is trained in F-IMNCI, which includes the package on 'facility based care of sick newborns and children'. F-IMNCI is skill-based training, based on a participatory approach combining classroom sessions with hands-on clinical sessions.

Medical officers and nurses not trained in IMNCI and working at health facilities should receive the full package of training with duration of training being 11 days.

Medical officers and nurses already trained in IMNCI will receive a training of the facility based care (FBC) portion of 5 days duration only.

The operational guidelines for F-IMNCI (already available) must be followed in this regard. Specific details include:

Training	F-IMNCI
Trainees	Medical officers and staff nurses at 24x7 PHCs, FRUs, district hospitals, MCH Level I, II and III.
Trainers	Senior paediatricians in district hospitals; faculty members of departments of paediatrics and community medicine of the medical colleges.
Venue	Medical college hospital, district hospital or private health facility with adequate number of deliveries and admitted cases of sick newborns and children under 5 years of age (at least 5 each).
Duration	11 days for medical officers and staff nurses who have not been trained in IMNCI and 5 days for those already trained in IMNCI.
Batch size	16 participants per batch.

Facility based newborn care training programme

All doctors and nurses posted in SNCUs need to undergo a more intensive training programme, including an observership at a recognized centre. The training programme includes skill-based training on essential and special care. Besides skills on clinical management, additional training is provided on housekeeping and maintenance of the equipment. The box on page 11 summarises the programme.

Training	Facility Based Newborn Care (FBNC).
Trainees	Medical officers and staff nurses posted in SNCU.
Trainers	National facilitators from National Neonatology Forum (NNF) and Indian Association of Neonatal Nurses (IANN), Faculty members, Department of Neonatology of National & Regional SNCU Collaborative Centres.
Venue	Training in a district hospital (SNCU) followed by observership in an SNCU collaborative centre or a medical college hospital with level-3 neonatology unit.
Duration	4 days of training followed by 2 weeks of observership.
Batch size	20-24 participants per batch of training and 4 participants per batch of observership.

1.2 Operational steps for planning and rolling out facility based newborn care in the state and districts

A National Collaborative Centre for FBNC will be engaged at the national level. This centre will provide technical expertise and overall support to the government for effective implementation and monitoring of the progress in the states. The National Collaborative Centre will work in close association with regional and state collaborative centres (see section 1.3) to build capacity of the service providers located at the newborn care facilities as well as extend mentoring support to the SNCU teams and state/district programme managers.

State orientation and planning meeting

- State planning meeting of at least one day should be organized for key state/district programme managers to plan for all components, phasing and budgeting of newborn care units. A detailed plan with budgets should be available with the state and concerned districts. The operational guideline should be disseminated to all the concerned programme managers and experts in the state and a one-day orientation can be carried out, if required
- If the plan and budgets have been approved in the state project implementation plan (PIP), a 'roll out' plan should be developed by involving the state and district programme managers. This includes physical establishment as well as recruitment and training of requisite human resources

Prioritisation of districts

The aim is to have an SNCU in each district hospital and at those sub-district hospitals where more than 3,000 deliveries are conducted per year. However, prioritisation of districts has to be done in setting up newborn care facilities and this can be guided by the following criteria:

- Prioritise the high focus districts (those districts which are performing poorly on RCH indicators). Within these districts, focus on districts with high infant mortality and those with high levels of institutional deliveries. High mortality districts are those with IMR higher than the state average
- Within the districts, prioritise facilities having high institutional delivery rates
- In the identified districts, newborn care facilities must be planned as follows:
 - Newborn care corners: In OT and labor room of district hospitals, sub-district hospitals, FRU/CHCs and at all 24x7 PHCs and MCH level 1 centres, that is at all delivery points.
 - Newborn stabilization unit: At all FRUs and CHCs with less than 3,000 deliveries per year

- SNCU at district hospitals and sub-district hospitals conducting more than 3,000 deliveries per year. If a newborn care unit exists in the medical college hospital, then it should be ensured that it fulfils the requirements of an SNCU as specified here.

Setting up a multi-disciplinary team

State should set up a multi-disciplinary team composed of doctors, civil works team (from the public works department) and biomedical engineers to oversee the overall assessment, civil work and refurbishment plans at the district and state level.

Procurement, supply and maintenance of the equipment

Based on a facility assessment, efforts should be made to mobilize unused essential newborn care equipment in peripheral units. Acquisition of new equipment should be as per RCH-II or state suggested mechanisms. It should be ensured that the equipment is of appropriate quality and comply with the specifications laid down in this regard. It is preferred that indigenously manufactured equipment be procured. Equipment is critical for optimal performance of SNCUs. Inadequate functioning or non-use of equipment will lead to ineffective services. Very often reasons for poor functioning of the equipment are non-stabilized power input, limited skills in use of equipment, lack of preventive maintenance and troubleshooting, absence of an annual maintenance contract (AMC) and non-honouring of AMC.

State should ensure some of the following steps for the maintenance and adequate functioning of the equipment:

- Build multiyear AMC into procurement contracts
- Provide designated automatic power back-up of adequate power
- Carry out power audit of the units, ensuring stabilized power input
- Train SNCU staff in use, preventive maintenance, and troubleshooting of equipment before installation
- Create network of trained technicians and biomedical engineers for optimum functioning of the equipment
- Earmark funds for local repair, and place funds with the unit in order to avoid inordinate delays in sanctioning of funds
- Conduct regular audit for functionality of equipment
- Outsource some selected maintenance services (e.g. medical and laboratory equipment maintenance)

Recruitment and training of staff

The quality of services offered at a facility depends on the availability of clinical expertise round-the-clock, backed by monitoring devices and equipment.

- Identify staffing requirements (see the section on human resources) and take steps to get the staff into position.
- Assess training needs and training load, and develop a training plan for the state and district. Trainings should be timed as close as possible to the operationalisation of the newborn care unit.

Record keeping

Each unit will record information on each admitted newborn in the standard case-recording sheet (Annexure 2.2). Standard case definitions would be used for recording the clinical conditions among admitted newborn babies (Annexure 2.1). Use of standard definitions would ensure that the data is valid, reliable and comparable across the units. Ideally, all units should have a computerised data entry system.

Based on the case records, the units will generate the report, using the standard reporting format (Annexure 1.3), and submit to the districts. The districts will send the collated reports to the relevant state health authorities and to the state collaborative centre.

Review and feedback

At each level, the reports will be analysed and performance reviewed on standard indicators (Annexure 1.2). At the unit level, review of cases and feedback to staff is a continuous process, and the medical officer in-charge/medical superintendent will be responsible for the review. The monthly reports should be compiled and sent to the district. At the district level, monthly reports should be compiled from all health facilities providing newborn care and forwarded to the state.

At the state (or divisional level), state or regional collaborative centres should provide a quarterly feedback to the districts and newborn care units.

The data compiled from all the districts will be forwarded by the state to the RCH division at the central level.

Supervision and monitoring

Periodic review by the state and district officials and by the faculty of the collaborative centres would be conducted to assess implementation and suggest mid-course correction.

Each SNCU must be assigned a mentoring team of two experts from the state, at least for the initial one to two years till the functioning of the units is well established. These can be the experts designated by NNF, IAP or the Indian Association of Neonatal Nursing (IANN) who will be required to undertake regular monitoring visits and provide mentoring support to the local teams. They should also assist the teams in analysing the data (case records, death audits, facility assessment, etc) and to accordingly plan and implement steps for quality improvement. Provision for mentoring visits can be built in the PIPs.

Ensuring quality of care

Adherence to standard operating procedures for housekeeping and for clinical care of admitted newborns is critical for ensuring quality care at the facilities. Refer to Section II for the details on housekeeping and clinical protocols.

Planning for newborn care facilities at district level

A district will have newborn care facilities established as a three-tiered system. While MCH centres and 24x7 PHCs will have NBCCs, the FRU/CHC will have NBSUs (in addition to NBCCs attached to the labor room and OT). SNCUs will be established at the district or sub-district hospital (wherever 3,000 or more deliveries are being conducted in a year).

Illustration 1: Assume a district that has one district hospital with more than 3,000 deliveries per year, five FRUs, and twenty 24x7 PHCs⁴. In one such district, the facilities required for newborn care are listed in Table 3.

Table 3: Facilities for newborn care in a district having one district hospital with more than 3,000 deliveries per year, five FRUs, and twenty 24x7 PHCs

Health Facility	Services	Nos.
Primary health centre/MCH Level I	Newborn care corners in labor rooms	20
First referral unit/ Community health centre/ MCH Level II	Newborn care corners in labor rooms	5
	Newborn care corners in OT	5
	Newborn stabilization unit	5
District hospital/ MCH Level III	Newborn care corners in labor rooms	1
	Newborn care corners in OT	1
	Special newborn care unit	1

1.3 Collaborative centres

Institutions fulfilling the following criteria will be identified, designated and supported to be collaborative centres:

- Have a functional Level II or Level III nursery (certified by NNF).
- Express interest in supporting FBNC in rural India.
- Have adequate and motivated faculty to support the units, who are willing to travel to the remote districts for about 1-2 weeks per year for training and mentoring visits.
- Follow rational practices of clinical newborn care and of housekeeping in their own units.
- Involved in operational research activities related to evidence based newborn care.

National Collaborative Centre

An apex institute or medical college will provide clear leadership and technical guidance for ensuring uniform, high quality implementation of FBNC. The designated National Collaborative Centre will be responsible for coordinating the activities of the regional and state collaborative centres.

The National Collaborative Centre will:

- Prepare technical guidelines, norms and protocols, and update them from time-to-time
- Monitor the progress and quality
- Review and analyse reports
- Mentor and support some regional/state collaborative centres
- Provide recommendations to the Ministry of Health and Family Welfare (MOHFW) to improve the implementation and make course corrections
- Build capacity of the regional and state collaborative centres

⁴Population norm for PHC/FRU, CHC/DH

Regional and state collaborative centres

Existing Centres of Excellence in newborn care will be identified and designated as regional collaborative centres. These will provide technical support in operationalisation of newborn care facilities, establishing a monitoring system, and conducting quality assessment. King Edward Memorial Hospital (Mumbai), PGIMER (Chandigarh), Institute of Child Health (Chennai), and Kalawati Saran Children's Hospital (New Delhi) have already been identified as collaborative centres.

In consultation with the state, one medical college will be identified as the state collaborative centre. As far as possible, these centres will be the ones identified already as state resource centres for skilled birth attendance.

The regional collaborative centre will ensure that in the state collaborative centre

- appropriate perinatal practices are followed;
- capacity of the faculty and staff is built so that they can play the role of local trainers and mentors; and
- data is well managed to allow for analysis and feedback.

Regional/State collaborative centres will perform the following tasks:

i. Capacity building of SNCU staff and administrators

- Establishing the state trainer pool
- Training of SNCU staff including doctors (medical officers and paediatricians) and nurses equipped with knowledge and skills for efficient management of sick newborns
- Training of all staff in housekeeping protocols for SNCUs and equipment maintenance
- Training in administration/managerial issues for in-charge MOs and nurse managers
- Refresher courses or continuing medical education (CME)

ii. Supporting the establishment of a standard recording and reporting system

- The regional/state collaborative centre will generate quarterly analysis report on various trends in the SNCUs, for example trends of admissions (inborn vs out-born), gestation, birth weight, causes of deaths, etc

iii. Ongoing support

- Follow-up observership visits to the collaborative centre for 2 weeks (after the FBNC training).
- Mentoring visits by the collaborative team to each centre once every three months. The mentoring visits will be made to look into all operational issues, including the quality of care being provided at the units. For a suggested checklist for mentoring visits see Annexure 1.4.
- Establish a technical helpdesk for queries related to patient care, unit management and case discussions.

iv. Quality assurance

- The regional/state collaborative centre will ensure that quality assurance systems for SNCUs are developed and bi-annual quality assessment is performed for these SNCUs

v. Operational research

- The national/regional/state collaborative centres will conduct focused operational research on issues where there is identified gap in knowledge or felt need for generating new evidence.

vi. Review meetings

- The regional/state collaborative centre will organise bi-annual review meetings of the in-charges of newborn care units in the states and districts, and also actively participate in the annual review meeting of all the collaborative centres.