STANDARDS FOR NEWBORN HEALTH SERVICES IN GHANA

JUNE 2020
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The deadline on the Millennium Development Goals (MDGs) expired in 2015. At that point, Ghana had not achieved Millennium Development Goal 4 largely due to stagnation and occasional rise in the neonatal mortality rate for over a decade. This indicates the need for much more work to achieve any significant reduction in the neonatal mortality rate of 29 per 1000 live births and effectively impact the overall decline in deaths of children under five years old in Ghana.

The Ghana Newborn Strategy and Action Plan 2014–2018 provides guidance for scaling up evidence-based interventions to reduce neonatal mortality. The document identifies the need to develop standards of care for key areas of newborn care including:

1. Basic Essential Newborn Care (ENC)
2. Management of adverse intrapartum events (including birth asphyxia)
3. Care of the preterm/low birth weight/growth-restricted baby
4. Management of neonatal infections/sick newborn

This document is a comprehensive guide to services that health care providers should deliver, as well as to the equipment, supplies, medicines, logistics, and staffing needs for all levels of the health care delivery chain in Ghana.

Policy makers, health managers, and service providers should all work toward meeting these standards in order to provide the needed quality of care for all newborns.
ACKNOWLEDGEMENT

The Ghana Health Service wishes to express its appreciation to the task team that worked tirelessly to develop this document. We wish to acknowledge particularly the technical and financial support provided by PATH under the Making Every Baby Count Initiative (MEBCI) project.

We express our sincere gratitude to the management and staff of the hospitals that assisted with pretesting the document. The World Health Organization (WHO) and UNICEF are recognised for their Technical Assistance. We offer special thanks and appreciation to members of the National Newborn Sub-committee who coordinated the entire process.

Our special thanks to USAID and the Breakthrough ACTION Project for their support in reviewing, editing and printing the Standards for Newborn Health Services in Ghana.
INTRODUCTION

A national standard for newborn services is critical in providing guidelines to health facility managers, doctors, and nurses for planning and improving the quality of services provided for newborns.

The opening chapter provides a list of Standard Statements that sets the tone for the quality of service provision expected of health care facilities. Subsequent chapters provide guidelines on minimum recommended standards at each level of the health care delivery chain, from the CHPS compound to the tertiary hospital. The final chapter contains charts for monitoring healthy and sick newborns during their stay in the health facility. Annexes contain information on infection prevention and control (IPC) and on laboratory services.
This chapter outlines twenty statements regarding quality of care, a matter that requires assessment, improvement, and monitoring within the health system. These statements address issues related to service delivery by health professionals, as well as to the experience of care that clients, patients, and their relatives receive.

**Standard 1:** All women, newborns, and their families shall receive health care with respect and dignity.

**Standard 2:** Communication with women and their families shall be effective and in response to their needs and preferences.

**Standard 3:** Families have the right to information concerning the condition and care of their newborns.

**Standard 4:** For every woman and newborn, competent and motivated staff shall be always available (24/7) to provide routine care and manage complications.

**Standard 5:** Every woman shall receive evidence-based routine care and management of complications during labour, childbirth, and the postnatal period, according to safe motherhood protocols.

**Standard 6:** Women in preterm labour shall receive appropriate interventions for both the woman and the baby, according to safe motherhood protocols.

**Standard 7:** No woman or newborn shall be subjected to unnecessary or harmful practices during labour, childbirth, and the postnatal period.

**Standard 8:** Every newborn shall receive evidence-based essential newborn care and management of complications as appropriate at birth, immediately after delivery, and during the postnatal period, according to national standards and protocols for newborn care.

**Standard 9:** Newborns shall receive early initiation of breastfeeding immediately after birth (within 30 minutes), except where medically not applicable.

**Standard 10:** Preterm and low-birthweight babies shall receive appropriate care including Kangaroo Mother Care (KMC), according to national standards and protocols for newborn care.

**Standard 11:** All district, regional, and tertiary hospitals shall provide rooms for Kangaroo Mother Care services.

**Standard 12:** Every woman and newborn with a condition that cannot be managed effectively with the available resources shall be appropriately referred (See pages 10-15).

**Standard 13:** Infection prevention and control (IPC) practices shall be strictly observed during labour, childbirth, and the neonatal period.

**Standard 14:** All labour wards and delivery suites shall have well-equipped designated resuscitation areas for newborn care in the same room to allow resuscitation to begin immediately without more than ten seconds delay after birth (Making Every Baby Count Initiative, 2015).
Standard 15: All hospitals shall have a separate room, ward, or department for inpatient care for sick newborns; mothers shall have ready access to their babies (guided by condition of baby). Well newborns shall be roomed-in with their mothers and shall not be in the sick newborn unit.

Standard 16: The health facility shall have an appropriate physical environment with adequate utilities (water, electricity or other energy, sanitation, handwashing, and waste disposal), medicines, supplies, and equipment for routine maternal and newborn care and management of complications.

Standard 17: Every woman and newborn shall have complete and accurate standardized medical records during labour, childbirth, and postnatal period.

Standard 18: Every health facility shall have a mechanism in place for data collection, analysis, and feedback that meets national standards as part of its monitoring and performance improvement activities.

Standard 19: All health facilities shall facilitate the registration of all newborns with the National Health Insurance Scheme (NHIS) and the Births and Deaths registry.

Standard 20: Health facilities shall plan, budget, advocate, and allocate resources for newborn services.
The healthcare system in Ghana has five levels of health provision: CHPS centres and maternity homes, health centres and clinics, district hospitals, regional hospitals and tertiary hospitals.

Though neonatal care is provided across five service levels, the structure of the health system in Ghana is such that different levels of facilities offer different types of care for newborns. Thus, the scope of newborn care services depends on the facility level.

The neonatal period is generally defined as the first 28 days of an infant’s life. However, infants may be cared for in a neonatal service area for more than 28 days, depending on the time from birth to discharge.

The levels at which newborn services are provided are described below.

Table 1: Newborn Care Facilities at Different Health Care Levels

<table>
<thead>
<tr>
<th>Level of care</th>
<th>Health facility</th>
<th>Care for all newborns at birth</th>
<th>Well baby</th>
<th>Sick newborns</th>
<th>KMC</th>
<th>Care of well-baby after discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>CHPS Centres, maternity homes</td>
<td>Newborn care corner in labour rooms</td>
<td>Postnatal/lying-in rooms</td>
<td>Prompt referral</td>
<td>Initiate skin-to-skin</td>
<td>Maternal &amp; Child Health (MCH) unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Prompt referral</td>
<td></td>
</tr>
<tr>
<td>Sub-district</td>
<td>Health centres/polyclinics</td>
<td>Newborn care corner in labour rooms</td>
<td>Postnatal/lying-in rooms Level I</td>
<td>Prompt referral</td>
<td>Initiate skin-to-skin</td>
<td>MCH unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Prompt referral</td>
<td></td>
</tr>
<tr>
<td>District</td>
<td>District hospitals, other hospitals (faith-based, quasi-government, private) Regional hospitals</td>
<td>Newborn care areas in labour rooms and operating theatres (01)</td>
<td>Postnatal/lying-in unit Level I</td>
<td>Sick Newborn Care Units (SNCU) Level II A, Level II B*</td>
<td>KMC unit</td>
<td>MCH unit</td>
</tr>
<tr>
<td>Regional</td>
<td>Regional hospitals</td>
<td>Newborn care areas in labour rooms and operating theatres (01)</td>
<td>Postnatal/lying-in unit Level I</td>
<td>SNCU Level II A, II B Neonatal Intensive Care Unit (NICU-Level III A) Infectious unit</td>
<td>KMC unit</td>
<td>MCH unit</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Teaching hospitals</td>
<td>Newborn care areas in labour rooms and operating theatres (07)</td>
<td>Postnatal/lying-in unit Level I</td>
<td>SNCU Level II A, II B Neonatal Intensive Care Unit (NICU-Level III B) Infectious unit</td>
<td>KMC unit</td>
<td>MCH unit</td>
</tr>
</tbody>
</table>

*If a paediatrician is present
Grading of levels of care

A neonatal service can provide a range of care from well infant care to highly specialised care. This includes care for sick, low birth weight and/or premature infants, and/or infants born with congenital conditions or other conditions compromising their health and survival.

**Level I:** Care for healthy, full-term babies; stabilization and care for infants born at 35 weeks of gestation to full term who remain physiologically stable

**Level IIA:** Intermediate care: Care for moderately ill infants with problems expected to resolve quickly; newborns >32 weeks gestational age and weight >1500g at birth; newborns recovering from serious illness previously treated at Level III.

**Level IIB:** High care: Care for newborns <32 weeks gestational age and weight <1500g at birth; with ventilatory support (mechanical ventilation for <24 h/CPAP)

**Level III NICU**

**Level III A:** Care for babies ≥ 28 weeks; with ventilatory support, management of complex problems, neonatal surgery

**Level III B:** Services at NICU Level III A plus complex surgery and investigations, sub-specialty consultation

**Table 2: Summary of Neonatal Services at Each Level of Care**

<table>
<thead>
<tr>
<th>Level of care</th>
<th>Neonatal facilities</th>
<th>Neat not bab</th>
<th>Sick baby</th>
<th>Sick baby</th>
<th>Sick baby</th>
<th>Sick baby referral services</th>
<th>Care of well baby after discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHPS Centres, Maternity Homes</td>
<td>Newborn care corner in labour rooms • Basic newborn resuscitation • Routine care/ENC*</td>
<td>Postnatal/lying-in rooms • Routine care/ENC*</td>
<td>Postnatal/lying-in rooms</td>
<td>Postnatal/lying-in rooms</td>
<td>Postnatal/lying-in rooms</td>
<td>Referral</td>
<td>Postnatal visits</td>
</tr>
<tr>
<td>Health Centres/ Polyclinics</td>
<td>Newborn care corner in labour rooms • Basic newborn resuscitation • Routine care/ENC*</td>
<td>Postnatal/lying-in rooms • Routine care/ENC*</td>
<td>Postnatal/lying-in rooms • Managing baby with problem (See standards for HC/polyclinics) • Managing baby with local infection</td>
<td>Postnatal/lying-in rooms • Managing baby with problem (See standards for HC/polyclinics) • Managing baby with local infection</td>
<td>Postnatal/lying-in rooms</td>
<td>Referral</td>
<td>Postnatal visits</td>
</tr>
</tbody>
</table>
Table 2: Summary of Neonatal Services at Each Level of Care (continued)

<table>
<thead>
<tr>
<th>Levels of care</th>
<th>Sub- district facilities</th>
<th>Primary referral hospitals</th>
<th>Secondary referral hospitals</th>
<th>Tertiary hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality birthing practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essential childbirth care including labour monitoring</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Management of pre-eclampsia, eclampsia</td>
<td>Referral</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Management of postpartum haemorrhage</td>
<td>Referral</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Management of difficult labour</td>
<td>Referral</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Management of preterm labour</td>
<td>Referral</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Management of maternal infection</td>
<td>Referral</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Infection prevention and control (IPC)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* ENC: Essential Newborn Care; ** Faith-based, quasi-governmental hospitals; ***If a paediatrician is present

Table 3 provides an outline of the components of quality birthing practices and neonatal services at each level of care.

Table 4 presents categories and clinical situations of babies requiring care and the needed care for each category. Where clinical management is considered beyond the capability of a facility service level, care will be provided at higher level of neonatal service. Therefore, Table 4 can assist health care providers in decision making with regards to referral (who needs referral and where).
| Neonatal resuscitation | Basic neonatal resuscitation | | | | | | | | Airway and Breathing | Position, clear the airway, stimulate | Ventilate with bag and mask | | | | | | Advanced neonatal resuscitation | Airway, Breathing, Circulation, Drugs | Position, clear the airway, stimulate | Ventilate with bag and mask | Intubate | Chest compressions | Drugs | | | | | | Essential newborn care/routine care | Essential Newborn Care (ENC)/Routine care | Thermal care | Cord care, eye care, vitamin K₁ administration | Examination of the newborn, measurement (weight, temperature, length, head circumference) | Early initiation and exclusive breastfeeding | Care to baby whose mother has HIV, TB, syphilis, Hepatitis B** | Emergency care before referral | Monitoring | Immunisation (BCG, polio) | Early appropriate quality (‘focused’) postnatal care | | | | | | KMC | Prolonged skin-to-skin | Exclusive breastfeeding | Family support | Infection prevention and control | Discharge and follow-up | | | | | | Supportive care for sick baby | Thermal care | Vitals monitoring | Oxygen therapy | Feeding | Fluid management | Neurodevelopmental care | | | | | | Management of sick baby | Care of newborns with temperature 35.5°C-36.4°C | Care of the well baby not able to feed directly from breast (alternative feeding methods) | Care of newborn with minor infections | | | | | | | Management of the sick newborn | See Table 4: Grading of Neonatal Care | | | | | | Postnatal services | Examination, measurements (weight, length, head circumference, temperature) | Growth and development monitoring | Feeding assessment | Immunization | | | | | | | | | | | | | | | | | | *If a paediatrician is present
** In line with national guidelines and protocols
### Table 4: Grading of Neonatal Care

<table>
<thead>
<tr>
<th>Category of baby requiring care</th>
<th>Resuscitation</th>
<th>Routine care/ Essential newborn care</th>
<th>Intermediate care</th>
<th>High care</th>
<th>Intensive care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Babies with:</td>
<td></td>
<td>Babies with:</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Low Apgar scores</td>
<td></td>
<td>• Intubation at birth</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Stable baby with congenital abnormalities</td>
<td></td>
<td>• LBW &lt;1500g</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Low birth weight (LBW) 1500–1800g</td>
<td></td>
<td>• Gestational age &lt;32wks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Gestational age 32–36 weeks</td>
<td></td>
<td>• Encephalopathy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Birth weight &gt;4000g</td>
<td></td>
<td>• Meconium aspiration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Meconium staining</td>
<td></td>
<td>• Septicaemia/ meningitis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Restricted growth</td>
<td></td>
<td>• Simple neonatal surgical problems</td>
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<td></td>
<td></td>
<td></td>
<td>• Possible severe infection</td>
<td></td>
<td></td>
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</tbody>
</table>

#### Care provided

- Basic resuscitation
- Advanced resuscitation
- IPC
- Safe, clean delivery
- Apgar score
- Maintenance of warmth
- Vitamin K, eye care, cord care, examination, measurements
- Early/exclusive breast feeding and breastfeeding support
- Care to baby whose mother has HIV, TB, syphilis, Hepatitis B
- Monitoring
- Emergency care before referral
- Immunization
- IPC
- Observation for and management of:
  - Hypothermia
  - Hypoglycaemia
  - Respiratory distress
  - Apnoea
  - Lethargy
  - Convulsions
  - Jaundice
  - Feeding problems
  - Intravenous fluids
  - Blood transfusion
  - Infections
  - Oxygen therapy
  - KMC
  - IPC
- Cardio-respiratory monitoring
- Oxygen therapy
- Recurrent apnoea
- Severe infection
- Convulsions
- Severe jaundice
- Blood transfusion
- Exchange BTF
- Persistent vomiting
- Hypoxic-ischaemic encephalopathy
- Nasal prong
- CPAP
- IPC
- IPPV
- Chest drains
- TPN
- Arterial catheterization
- Exchange BTF
- Ultrasound and echocardiogram
- Sophisticated diagnostic investigation
- Sub-specialist consultation
- IPC

- IPPV: Intermittent positive-pressure ventilation
- TPN: Total parenteral nutrition
- CPAP: Continuous positive airway pressure
- Exchange BTF: Exchange blood transfusion
- IPC: Infection Prevention and Control

Chapters 3 to 5 provide detailed information on the services, human resources, logistics, and supplies required for the provision of quality services at each level. Facility managers should work towards meeting the recommended standards for their level.
CHPS centres with midwives, health centres and maternity homes are located at sub-district level.

**Categories of staff:** Midwives, Community Health Officers, General nurses. Additional categories in health centres and maternity homes: Physician assistants, orderlies. These health facilities should have space within the labour room for providing immediate/essential newborn care to all newborns.

**Summary of services provided:**

1. Basic neonatal resuscitation
2. Routine care/ENC
   - Thermal care
   - Cord care, eye care, vitamin K1 administration
   - Examination of the newborn, measurement (weight, temperature, length, head circumference)
   - Early initiation and exclusive breastfeeding
   - Care of baby whose mother has HIV, TB, syphilis, hepatitis B
   - Emergency care before referral
   - Monitoring
   - Immunisation (bacille Calmette-Guerin [BCG], polio, hepatitis B)
3. Management of sick baby
   - Care of newborns with temperature 35.5° C–36.4° C
   - Care of stable newborns with birth weight 1880–2000 g
   - Care of the well baby not able to feed directly from breast (alternative feeding methods)
   - Care of newborn with minor infections
4. Early appropriate quality ('focused') postnatal care
5. Referral services
6. IPC

**Services**

**1. Basic Newborn Resuscitation**

**Equipment**
- 1 Flat resuscitation table
- Heat source: Radiant warmer (onion bulbs may be used in its absence)
- 1 Clock with seconds hand per newborn resuscitation area
- Stethoscope
- 1 Digital thermometer
- 1 Oxygen cylinder
- IPC: Refer to Annex 1

**Logistics and supplies**
- 2 Clean cot sheets per baby
- 1 Baby cap per baby
- 1 Reusable bulb syringe per baby
- 1 Face mask size 0 per baby
- 1 Face mask size 1 per baby
- Neonatal nasal prongs (single use) as needed (no stock out)
- 2 Neonatal oxygen face masks per labour ward
- 1 Identification band per baby
- 1 Cord clamp per baby (no stock out)
- 1 Cord tie per baby (no stock out)
- Sterile and examination gloves as needed (no stock out)
- 1 Identification band per baby
- IPC (refer to Annex 1)
Services

2. Routine Care/ENC

2.1 Eye Care, Cord Care, Vitamin K1

Logistics and supplies / Medicines
- Tetracycline 1% eye ointment or Chloramphenicol eye drops 0.5%
- Chlorhexidine di-gluconate gel 7.1%
- 1 Sterile syringe (1ml) and needle (25 gauge) as needed (no stock out)
- Sterile swabs
- Injection vitamin K1: 1mg in 0.5/1ml as needed (no stock out)
- Sterile and examination gloves as needed (no stock out)

2.2 Examination of the Newborn, Temperature, Measurement, and Weighing

Equipment and Medicines
- 1 Digital thermometer per room
- 1 Infantometer per facility
- 1 Flexible tape measure per room
- 1 Standardised baby weighing scale (digital or mechanical with 5–10gr resolution) per room
- 1 Examination form per baby
- Sterile and examination gloves as needed (no stock out)

2.3 Early Initiation and Exclusive Breastfeeding

Equipment
- 1 set of feeding cup and spoon per baby

2.4 Immunisation (BCG, Polio, Hepatitis B)

Equipment, Logistics, Supplies, and Medicines
- Vaccine carriers, cold boxes, ice packs and appropriate storage facilities
- Sterile syringes 1ml and needles 25g as needed (no stock out)
- Sterile swabs
- Vaccines (OPV, BCG, Hepatitis B) as needed (no stock out)

2.5 Monitoring
- 1 Well baby monitoring chart per baby

2.6 Administration of Anti-Retrovirals for Prophylaxis

Medicines
- ARVs as per national protocols and guidelines

2.7 Pre-referral Care for the Sick Neonate Baby with danger signs and other neonatal conditions

Equipment
- 1 Medicine refrigerator
- 1 Oxygen concentrator per room
- 1 Pulse oximeter per room
- 1 Medicine trolley per room
- 1 Heat source/radiant warmer per resuscitation area
- 1 Light source per room
- 1 Glucometer per room

Logistics, Supplies and Medicines
- Thermal care (skin-to-skin during transport)
- Vitals monitoring (1 monitoring chart per baby)
- Feeding (1 feeding cup and spoon per baby)
- Oxygen therapy:
  - Nasal prongs per baby
  - Face mask per baby
- Referral forms
- All monitoring forms
- Antibiotic charts
- Syringes 1ml, 2ml as needed (no stock out)
- 25 gauge needles as needed (no stock out)
- Water for injection as needed (no stock out)
- Pre-referral antibiotics and other as needed (no stock out) *(Refer to the essential medicines list and the standard treatment guidelines)*
- Glucose strips as needed (no stock out)
- Sharps box
- IPC: Refer to Annex 1
- Laboratory support: Refer to Annex 2

3. Management of Sick Baby

3.1 Care of the Baby with Minor Infections
Medicines
• Refer to essential medicine list and standard treatment guidelines

3.2 Care of the Stable Small Pre-term Baby (1800–2000g)

3.3 Care of Well Baby Needing Alternative Feeding Method

3.4 Care of Newborn with Temperature 35.5 °C–36.4 °C

Equipment, Logistics, and Supplies
• 2 Cot sheets per baby
• 2 Blankets per baby
• 1 Feeding cup and spoon per baby
• Feeding and monitoring charts

4. Early Appropriate Quality ('Focused') Postnatal Care

Equipment, Logistics, Supplies, and Medicines
• 1 Baby cot
• 1 Examination table with mattress per room
• 1 Examination form per baby
• 1 Light source per examination area
• 1 Digital thermometer per examination area
• 1 Flexible tape measure per room
• 1 Infantometer per facility
• 1 Standardised baby weighing scale (digital or mechanical with 5-10 g resolution) per room
• Sterile syringes and needles as needed (no stock out)
• Sterile swabs as needed (no stock out)
• Vaccines
• IPC: Refer to Annex 1
Standards for District and Regional Hospitals

District and Regional hospitals serve as a referral hospital/facility. The level of newborn care provided at district hospitals depends on the presence of a paediatrician. In the absence of a paediatrician, supportive and intermediate care are provided at district hospitals.

These referral facilities need permanent and trained staff in newborn care.

Categories of staff: Paediatricians, obstetrics and gynaecology specialists, medical officers, physician assistants/medical assistants, paediatric nurses, general nurses, midwives, enrolled nurses, community health nurses, ward assistants, pharmacists, anaesthetists, dispensary technicians/assistants, laboratory technicians/assistants, field technicians, nutrition technical officers, biomedical scientists, radiographers, social workers, clinical psychologists, orderlies.

Services.

1. Basic neonatal resuscitation (regional hospital, district hospital)

Advanced neonatal resuscitation (regional hospital, district hospital if paediatrician)

2. Routine care/ENC
   - Thermal care
   - Cord care, eye care, vitamin K1
   - Examination of the newborn,

   measurement (weight, temperature, length, head circumference)

   - Early initiation and exclusive breastfeeding
   - Care of baby whose mother has HIV, TB, syphilis, hepatitis B
   - Emergency care before referral
   - Monitoring
   - Immunisation (BCG, polio, hepatitis B)

3. Early appropriate quality (‘focused’) postnatal care

4. Kangaroo Mother Care

5. Management of sick newborn
   - Supportive care of sick newborn (regional hospital, district hospital)
   - Intermediate care (regional hospital, district hospital)
   - High care (regional hospital, district hospital (if paediatrician present))
   - Intensive Care NICU Level III A (regional hospital)
   - Management of newborn with infectious diseases (regional hospital) *

6. Referral services

7. Newborn screening:
   - for sickle cell disease
   - for retinopathy of prematurity

8. IPC (Refer to Annex 1)

*For isolation guidelines see Annexes 1–3
1. Basic And Advanced Newborn Resuscitation

Equipment
- 1 Designated resuscitation area per delivery bed
- 1 Flat resuscitation table per delivery bed
- 1 Radiant warmer per resuscitation table
- 2 Clocks with second hand per delivery room
- 4 Digital/infrared Thermometers per delivery room
- 1 Pulse oximeter per resuscitation table
- 1 Paediatric stethoscope per resuscitation table
- 1 Oxygen cylinder per resuscitation table
- 1 Oxygen flow meter per oxygen cylinder
- 1 Laryngoscope with extra set of batteries and bulbs and Blades No: 1, 0, 00
- 1 Drip stand per resuscitation table
- 2 Glucometers per room
- 1 Sterile cord scissors per baby
- 10 Kidney dishes per delivery room
- 10 Gallipots per delivery room
- 1 Emergency tray per resuscitation table
- 1 Autoclave per unit
- 2 Suction machines per delivery room
- 2 HBB Training sets
- IPC: Refer to Annex 1
**Logistics and Supplies**
- 2 Sterile cot sheets per baby
- 1 blanket per baby
- 1 Cap per baby
- Suction tubes sizes 8 F, 10 F as needed (no stock out)
- 2 Reusable bulb syringes per baby plus as needed (no stock out)
- 1 Ventilation bag size 240-500ml per resuscitation table
- 1 Face masks size 0 per ventilation bag
- 1 Face masks size 1 per ventilation bag
- Endotracheal tubes size 2.5, 3.0, 3.5 as needed (no stock out) *
- Umbilical catheter 3.5 F, 5 F
- Nasogastric tubes sizes 5, 6, 7, 8 as needed (no stock out)
- Newborn oxygen delivery face mask as needed (no stock out)
- Newborn nasal prongs as needed (no stock out)
- 1 Oropharyngeal airway - newborn sizes (00) per resuscitation table
- Syringes 1 ml, 2 ml and 10 ml as needed (no stock out)
- Giving set as needed (no stock out)
- Cannulae gauge 24-26 as needed (no stock out)
- Dosiflow as needed (no stock out)
- Glucometer strips as needed (no stock out)
- Sterile lancets as needed (no stock out)
- Swabs as needed (no stock out)
- Sterile and examination gloves as needed (no stock out)
- 1 Identification band per baby (no stock out)
- 1 Cord clamp per baby (no stock out)
- 1 Cord tie per baby (no stock out)
- IPC: Refer Annex 1
*Regional Hospital, District hospital if paediatrician present

**Medicines**
- IV Infusions
  - (10% dextrose, 1/5 NS in 10% dextrose, NS)
- Inj. Adrenaline 1: 10 000
- Inj. Phenobarbitone
- Inj. Midazolam
- Inj. Phenytoin
- Inj. Naloxone
- Inj. Furosemide
- Water for injection
- Methylated spirit
- IPC: Refer to Annex 1
2. **Routine Care/ENC**

**Equipment**
- 1 Radiant warmer/heat source per room
- 1 Infantometer per room
- 1 Tape measure per room
- 1 Standardised infant weighing scale (digital or mechanical with 5–10 g resolution) per room
- 1 Diaper scale per room
- 1 Set of feeding cup and spoon per baby
- Adequate cold chain facilities
- 1 Baby cot per baby
- 1 Examination table with mattress per room
- 1 Examination and monitoring chart per baby
- 1 Light source per examination table
- 4 Digital thermometers per room
- IPC: Refer to Annex 1

**Logistics and supplies**
- 2 Sterile cot sheets per baby
- 2 Caps per baby
- Sterile and examination gloves as needed (no stock out)
- 1 Sterile cord clamp and cord ties per baby
- Sterile syringes 1ml, 2ml as needed (no stock out)
- Sterile needles 25G as needed (no stock out)
- Sterile cotton swabs as needed (no stock out)
- 1 Examination and well-baby monitoring form per baby (no stock out)
- Referral forms as needed (no stock out)
- Medicine dosing charts
- IPC: Refer to Annex 1

**Medicines as needed (no stock out)**
- Vaccines
- Methylated spirit
- 7.1% Chlorhexidine di-gluconate gel
- 1% Tetracycline eye ointment or 0.5% Chloramphenicol eye drops
- Antibiotics
- Injection vitamin K1 1mg in 0.5/1ml
- Antiretrovirals
- INH tablets
- Benzathine penicillin injection

All other medications as per essential medicines list and standard treatment guidelines, as well as other national and international protocols.
3. Early Appropriate Quality ('Focused') Postnatal Care

**Equipment /Logistics and supplies/Medicines**
- 1 Baby cot
- 1 Examination table with mattress per room
- 1 Examination form per baby
- 1 Light source per examination area
- 1 Digital thermometer per examination area
- 1 Flexible tape measure per room
- 1 Infantometer per facility
- 1 Standardised infant weighing scale (digital or mechanical with 5–10g resolution) per room
- Sterile syringes and needles as needed (no stock out)
- Sterile swabs as needed (no stock out)
- Vaccines
- IPC: Refer to Annex 1

4. Kangaroo Mother Care

**Equipment**
- 1 KMC room with cabinets
- Adequate washroom & toilet facilities for mothers
- 1 Resuscitation area within KMC room
- 1 Table and 4 chairs as nurses' station
- 1 Chair per mother
- 1 Hospital bed with bed sheet per mother
- 1 Bedside locker for each bed
- 1 Equipment trolley per room
- 1 Television for mothers' viewing
- 1 Refrigerator per room for keeping breast milk
- 1 Suction machine per room
- 1 Pulse oximeter per room
- 1 Oxygen concentrator per room
- 1 Oxygen cylinder per room
- 1 Flow meter per oxygen cylinder
- 1 Glucometer per room
- 1 Drip stand per room
- 1 Infant weighing scale (digital or mechanical with 5–10 g resolution)
- 1 Diaper scale
- 1 Paediatric stethoscope per room
- 2 Digital thermometers per room
- 1 Wall clock per room
- 1 Measuring jug or container
- 1 Pair of scissors per room
- IPC: Refer to Annex 1
## Logistics/Supplies
- 2 Reusable bulb syringes for the resuscitation area
- 2 Ventilation bags, size 240–500ml for the resuscitation area
- Face mask size 0 as needed (no stock out)
- Face mask size 1 as needed (no stock out)
- Nasal prongs as needed (no stock out)
- Suction tubes as needed (no stock out)
- 1 Container of glucometer strips per room (no stock out)
- Sterile lancets as needed (no stock out)
- Dosi Flow as needed (no stock out)
- Giving sets as needed (no stock out)
- Sterile and examination gloves as needed (no stock out)
- 2 Tourniquets per room
- 2 Tape measures per room
- 1 Set of plastic cups, spoon, tray, paper tissue or bib per baby
- 3 Pairs of socks per baby*
- 3 Caps per baby*
- Diapers as needed (no stock out)*
- 2 Binder cloths/ladies tube (inner) per baby*
- 2 Front-opening shirts per mother*
- 1 Admission and discharge book
- 1 Monitoring form per patient per day
- Standard growth chart and growth charts for LBW
- IPC: Refer Annex 1

## 5.1. Supportive Care for the Sick Neonate

### Equipment
- 2 Radiant warmers per room (LDU)
- 1 Radiant warmer per 3 cots (HDU, ICU)
- 1 Incubator per 2 basins, 1 transport incubator
- 1 Sphygmomanometer with neonatal cuff per 3 cots (LDU)
- 1 Sphygmomanometer with neonatal cuff per cot (HDU, ICU)
- 1 Pulse oximeter per 3 basins/cots (LDU)
- 1 Pulse oximeter per 1 cot (HDU, ICU)
- 2 Thermometers per room (LDU)
- 4 Thermometers per room (HDU, ICU)
- 1 Weighing scale per room
- 1 Diaper scale per room
- 2 Stethoscopes per room (LDU), 4 per room (HDU, ICU)
- 1 Apnoea monitor per cot (HDU)
- 1 Resuscitation kit per resuscitation area*
- 4 Oxygen cylinders/concentrators/blenders per room
- 4 Oxygen flow meters
• 2 CPAP machines per room (regional hospital, district hospital with paediatrician)
• 1 Ventilator per room (regional hospital)
• 1 Cardiopulmonary and blood pressure monitor per cot (ICU)
• 1 Drip stand per cot
• 1 Infusion pump per cot
• 1 Cut down set per room
• 1 Cup with lid, 1 teaspoon, and 1 measuring cup per baby
• 1 Feeding perfusor per cot
• 1 Glucometer per room
• Ultrasound (Regional hospital)
• 1 Refrigerator per room
• Portable X-ray machines (regional hospital)

*bag & mask, suction tubes, endotracheal tubes, laryngoscope, oro-pharyngeal airway.

**Logistics**

• 2 Blankets per baby
• 2 Sterile cot sheets per baby
• 1 Monitoring chart per baby per day (no stock out)
  - Vital signs monitoring chart
  - Newborn feeding/IV fluids input and output chart
  - Seizure monitoring chart
  - Random blood sugar monitoring chart
  - Examination form
• Exchange transfusion charts as needed (no stock out)
• Nasal prongs as needed (no stock out)
• Face mask as needed (no stock out)
• Suction catheter 5–8Fr as needed (no stock out)
• Dosi Flow as needed (no stock out)
• Giving set as needed (no stock out)
• Burette as needed (no stock out)
• Cannulae 24 and 25 gauge (no stock out)
• Sterile Syringes 1ml, 2ml, 5ml, 10ml, 20ml and needles as needed (no stock out)
• Urinary catheter size 4–6Fr (no stock out)
• Umbilical catheters 3.5F and 5Fr
• Neonatal intra-osseous needles or 18g disposable needles
• Urinary drainage bag (no stock out)
• Neonatal urine collection bag (no stock out)
• Nasogastric tube 6, 8Fr as needed (no stock out)
• Glucose strips as needed (no stock out)
• Sterile and examination gloves as needed (no stock out)
• Positioning aids: Bendy Bumpers, rolls, nests.
### Medicines
- 1/5 Normal saline in 10% dextrose (no stock out)
- Ringers lactate (no stock out)
- 10% Dextrose (not stock out)
- Normal Saline (not stock out)
- IPC: Refer Annex 1

### 5.2. Management of Neonatal Infections and Other Neonatal Conditions

#### Equipment
- 1 Medicine refrigerator per ward
- 1 Medicine trolley per room
- 1 Light source per room and 1 light source per examination table
- 1 HemoCue per room
- 1 Bilirubinometer per room
- Laboratory support: Refer to Annex 2
- 1 Intensive phototherapy unit per 3 beds (LDU) and 1 per HC/ICU

#### Logistics and Supplies
- 1 Blanket per baby
- 2 Cot sheets per baby
- Syringes and needles as needed (no stock out)
- Water for injection as needed (no stock out)
- 4 Sharps boxes per room
- Two 3-way taps as needed (no stock out)
- Chest tube 8, 10 or 12Fr (chest drain kit)
- Transfusion sets as needed (no stock out)
- Sterile dressings as needed (no stock out)
- Sterile and examination gloves as needed (no stock out)
- Plaster
- Rapid diagnostic test for malaria as needed (no stock out)
- Exchange transfusion charts as needed (no stock out)
- Medicines dosing charts

### Medicines
- Antibiotics
- Analgesics
- Anticonvulsants
- Antiretrovirals
- Antimalarials
- Vaccines and immunoglobulins
- Blood and blood products
- Intravenous fluids
- Electrolyte solutions
- Respiratory stimulants
- Nutritional supplements
- Total Parenteral Nutrition
- Surfactant Inj.
- Prostaglandin Inj.

**NOTE:** All medicines as per Essential Medicines List, Standard Treatment Guidelines and other National protocols/Institutional protocols
Standards for Tertiary Hospitals

Following is a list of categories of staff who are integral to the work accomplished at tertiary hospitals:

- Nurses, midwives, obstetrics and gynaecology specialists/consultants, paediatricians, neonatologists, paediatric surgeons, medical officers, paediatric nurses, registered general nurses, physiotherapists, clinical psychologists, intensivists, respiratory therapists, dispensary technicians/assistants, pharmacists, radiographers, anaesthetists, social workers, dieticians, nutrition technical officers, clinical psychologists, laboratory technicians/assistants, field technicians, biomedical scientists, laboratory medicine physicians (microbiologists, haematologists, chemical pathologists, immunologists, histopathologists), community health officers, public health nurses, orderlies.

Services

1. Basic and advanced neonatal resuscitation

2. ENC/Routine care
   - Thermal care
   - Cord care, eye care, vitamin K1 administration
   - Examination of the newborn, measurement (weight, temperature, length, head circumference)
   - Early initiation and exclusive breastfeeding

- Care to baby whose mother has HIV, TB, syphilis, hepatitis B
- Emergency care before referral
- Monitoring
- Immunisation (BCG, polio, hepatitis B)

3. Early appropriate quality (‘focused’) postnatal care

4. Kangaroo Mother Care

1. Management of sick newborn
   - Supportive care of sick newborn
   - Intermediate care
   - High care
   - Intensive care NICU Level III B
   - Management of newborn with infectious diseases*

2. Referral services

3. Newborn screening:
   - for sickle cell disease
   - for Retinopathy of prematurity

4. IPC (Refer to Annex 1)

*For isolation criteria, see Annexes 1–3
1. Basic and Advanced Newborn Resuscitation

**Equipment**
- 1 Designated resuscitation area per 3 cots
- 1 Flat resuscitation table per resuscitation area
- 1 Radiant warmer per resuscitation area
- 2 Clocks with second hand per delivery room
- 4 Digital/infrared thermometers per delivery room
- 1 Pulse oximeter per resuscitation table
- 1 Paediatric stethoscope per resuscitation table
- 2 Oxygen concentrators per room
- 1 Oxygen cylinder per resuscitation table
- 1 Oxygen flow meter per oxygen cylinder
- 1 Laryngoscope with extra set of batteries and bulb with blade sizes 1, 0, and 00
- 1 Drip stand per resuscitation area
- 2 Glucometers per unit
- 1 Sterile cord scissor per baby
- 20 Kidney dishes per room
- 10 Gallipots per room
- 1 Autoclave per unit
- 1 Emergency tray per room
- 2 Suction machines per room
- 4–6 HBB Training sets per newborn unit

**Logistics and Supplies**
- 2 Sterile cot sheets per baby
- 1 Blanket per baby
- 1 Cap per baby
- Suction tubes sizes 8 Fr and 10 Fr as needed (no stock out)
- 2 Reusable bulb syringes per baby, plus as needed (no stock out)
- Ventilation bag size 240–500 ml per resuscitation table
- 1 Face mask, size 0 per ventilation bag
- 1 Face mask, size 1 per ventilation bag
- Endotracheal tubes, sizes 2.5, 3.0, 3.5 as needed (no stock out)
- Umbilical catheter (3.5 and 5 FG) as needed (no stock out)
- Nasogastric tubes, sizes 5, 6, 7, 8 as needed (no stock out)
- Newborn oxygen delivery face mask as needed (no stock out)
- Newborn nasal prongs as needed (no stock out)
- 1 Oropharyngeal airway, newborn sizes (00) per resuscitation table
- Syringes 1 ml, 2 ml, 10ml as needed (no stock out)
- Giving sets as needed (no stock out)
- Cannulae gauge 24–26 as needed (no stock out)
2. Routine/Essential Newborn Care at Birth and Postnatal Period

**Equipment**
- 2 Radiant warmers/heat source per room
- 1 Infantometer per room
- 2 Tape measures per room
- 1 Standardised baby weighing scale (digital or mechanical with 5–10 g resolution) per room
- 1 Diaper scale per room
- 1 Set of feeding cup and spoon per baby
- Adequate cold chain facilities
- 1 Baby cot per baby
- 2 Examination tables with soft mattress per room
- 1 Light source per examination table
- 4 Digital thermometers per room
- IPC: Refer to Annex 1

**Medicines**
- Intravenous fluids N/S, 10% D, 1/5 NS in 10% D
- Inotropes (Adrenaline 1:10,000 ampoule)
- Anticonvulsants
- Naloxone
- Diuretics
- Water for injection
- Methylated spirit
- IPC: Refer to Annex 1
**Logistics and supplies**

- 4 Clean/sterile cot sheets per baby
- 2 Caps per baby
- Sterile and examination gloves as needed (no stock out)
- 1 Sterile cord clamp and cord tie per baby
- Sterile syringes 1 ml, and 2 ml as needed (no stock out)
- Sterile needles, 25 gauge as needed (no stock out)
- Sterile and examination gloves as needed (no stock out)
- Sterile cotton swabs as needed (no stock out)
- 1 Examination and well-baby monitoring form per baby (no stock out)
- IPC: Refer to Annex 1

**Medicines, as needed (no stock out)**

- Vaccines
- Methylated spirit
- Chlorhexidine di-gluconate 7.1% gel
- 1% Tetracycline eye ointment or 0.5% chloramphenicol eye drops
- Antibiotics
- Injection vitamin K1, 1mg in 0.5/1ml
- Antiretrovirals
- INH tablets
- Injection benzathine penicillin

All other medications as per essential medicines list and standard treatment guidelines, as well as per other national and international protocols.

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**3. Early Appropriate Quality ('Focused') Postnatal Care**

**Equipment/Logistics and Supplies/Medicines**

- 1 Baby cot
- 1 Examination table with mattress per room
- 1 Examination form per baby
- 1 Light source per examination area
- 1 Digital thermometer per examination area
- 1 Flexible tape measure per room
- 1 Infantometer per facility
- 1 Infant weighing scale (digital or mechanical with 5–10 g resolution) per room
- Sterile syringes and needles as needed (no stock out)
- Sterile swabs as needed (no stock out)
- Vaccines
- IPC: Refer to Annex 1
4. Kangaroo Mother Care

Equipment
- 1 KMC room with cabinets
- Adequate washroom and toilet facilities for mothers
- 1 Resuscitation area within KMC room
- 1 Table and 4 chairs as nurses’ station
- 1 Chair per mother
- 1 Hospital bed with bed sheet per mother
- 1 Bedside locker for each bed
- 1 Equipment trolley per room
- 1 Television for mothers’ viewing
- 1 Refrigerator per room for keeping breast milk
- 1 Suction machine per room
- 1 Pulse oximeter per room
- 1 Oxygen concentrator per room
- 1 Oxygen cylinder per resuscitation area
- 1 Flow meter per oxygen cylinder
- 1 Glucometer per room
- 1 Drip stand per room
- 1 Infant weighing scale (digital or mechanical with 5–10 g resolution)
- 1 Diaper scale
- 1 Paediatric stethoscope per room
- 2 Digital thermometers per room
- 1 Wall clock per room
- 1 Measuring jug or container
- 1 Oxygen concentrator per room
- 1 Pair of scissors per room
- IPC: Refer Annex 1

Logistics and Supplies
- 2 Reusable bulb syringes per resuscitation area
- 2 Ventilation bags, size 240 to 500 mls per resuscitation area
- Face masks size 0 and 1 as needed (no stock out)
- Nasal prongs as needed (no stock out)
- Suction tubes as needed (no stock out)
- Glucometer strips as needed (no stock out)
- Sterile lancets as needed (no stock out)
- Dosi Flow as needed (no stock out)
- Giving set as needed (no stock out)
- Sterile and examination gloves as needed (no stock out)
- 2 Tourniquets per room
5.1. Supportive Care for the Sick Neonate

Equipment

- 2 Radiant warmers per room (LDU*)
- 1 Radiant warmer per 3 cots (HDU**)
- 1 Incubator per 2 basinet
- 1 Sphygmomanometer with neonatal cuff per 3 cots (LDU)
- 1 Sphygmomanometer with neonatal cuff per cot (HDU)
- 1 Pulse oximeter per 3 basinet/cots (LDU)
- 1 Pulse oximeter per 1 intensive care cot (HDU)
- 4 Thermometers per room
- 1 Weighing scale per room
- 1 Diaper scale per room
- 4 Paediatric stethoscopes per room
- 1 Apnoea monitor per high-care cot
- 1 Resuscitation kit per resuscitation area***
- 4 Oxygen cylinders/concentrators/blenders per room

Medicines as needed (no stock out)

- IV infusion, 10% dextrose
- Caffeine citrate
- Micronutrient
- Oxygen
- 1 Bottle of methylated spirit per baby OR
- 1 tube of 7.1% chlorhexidine di-gluconate gel per baby
- 1% Tetracycline eye ointment or 0.5% chloramphenicol eye drops
- Milton tablets
- IPC: Refer to Annex 1

* To be provided by family

** To be provided by family

*** To be provided by family

STANDARDS FOR NEWBORN HEALTH SERVICES IN GHANA
Logistics and Supplies

- 2 Blankets per baby
- 2 Sterile cot sheets per baby
- 1 Monitoring chart per baby per day (no stock out)
  - Vital signs monitoring chart
  - Newborn feeding/IV fluids input and output chart
  - Seizure monitoring chart
  - Random blood sugar monitoring chart
  - Examination form
- Exchange transfusion charts as needed (no stock out)
- Nasal prongs as needed (no stock out)
- Face masks as needed (no stock out)
- Suction catheters 5–8 Fr as needed (no stock out)
- Dosi Flow as needed (no stock out)
- Giving set as needed (no stock out)
- Burettes as needed (no stock out)
- Canulae 24 and 25 gauge (no stock out)
- Sterile syringes 1ml, 2ml, 5ml, 10ml, 20ml and syringes as needed (no stock out)
- Umbilical catheters 3.5Fr, 5Fr
- Neonatal intra-osseous needles
- Urinary catheter size 4–6Fr as needed (no stock out)
- Urinary drainage bag as needed (no stock out)
- Neonatal urine collection bag as needed (no stock out)
- Nasogastric tube 6Fr and 8Fr as needed (no stock out)
- Sterile and examination gloves as needed (no stock out)

LDU: Low dependency unit
HDL: High dependency unit
**** bag and mask, suction tubes, endotracheal tubes, laryngoscope, oropharyngeal airway
5.2. Management of Neonatal Infections and Other Neonatal Conditions

**Equipment**
- 1 Medicine refrigerator per room
- 1 Medicine trolley per room
- 1 Light source per room and 1 light source per examination table
- 1 HemoCue per unit
- 1 Bilirubinometer per unit
- 1 Intensive phototherapy unit per 2 newborn cots/incubators (LDU) and 1 per HC/ICU laboratory support: Refer to Annex 2

**Logistics and supplies**
- 1 Blanket per baby
- 2 Cot sheets per baby
- Syringes and needles, as needed (no stock out)
- Water for injection as needed (no stock out)
- 4 Sharps boxes per room
- Two 3-way taps as needed (no stock out)
- Chest tube 8, 10 or 12 Fr
- Rapid diagnostic test for malaria as needed (no stock out)
- Transfusion sets as needed (no stock out)
- Sterile dressings as needed (no stock out)
- Sterile and examination gloves as needed (no stock out)
- Umbilical catheters 3.5Fr, 5Fr
- Neonatal intra-osseous needles
- Urinary catheter size 4–6Fr as needed (no stock out)
- Urinary drainage bag as needed (no stock out)

Medicines as needed (no stock out)
- 1/5 Normal saline in 10% dextrose IV solution
- Ringers lactate IV solution
- 10% Dextrose IV solution
- Normal saline IV solution
- IPC: Refer to Annex 1

* LDU: Low dependency unit
** HDU: High dependency unit
NOTE: All medicines as per Essential Medicines List, Standard Treatment Guidelines, and other national and institutional protocols
Newborn Monitoring Forms

This chapter describes the tools and materials used for monitoring the health of newborns. It is important to monitor vital signs and other essential parameters of care for both healthy and sick newborns during their stay in the health facility. Monitoring of newborns is essential to detecting danger signs quickly and allows for life-saving interventions to commence as soon as possible when necessary.

Vitals Monitoring Chart

The Vitals Monitoring Chart is used by the clinical staff for monitoring the vitals of a sick newborn. The form monitors vital signs of the baby such as respiratory rate, heart rate, and temperature. It also monitors the colour of the baby, SpO2, and other vitals. The danger zones on the chart have distinct shadings and an included key guides the use and interpretation for decision-making.

Listed below are monitoring forms for both the sick newborn and the well newborn. The forms are as follows:

1. Newborn in patient monitoring chart
2. Random blood sugar monitoring form
3. Seizure chart
4. Newborn IV fluids / feeding chart
5. Newborn Output chart
6. Newborn examination form
7. Healthy newborn monitoring form
8. Newborn head ticket
# Standards for Newborn Health Services in Ghana

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<th>Sex:</th>
<th>Ward:</th>
<th>Folder No.:</th>
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## Newborn In-Patient Monitoring Chart

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<th>Heart rate (bpm)</th>
<th>Respiratory rate</th>
<th>Chest in-drawing (Y/N)</th>
<th>Blood Pressure</th>
<th>Colour</th>
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</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood Pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPO(_2)%</td>
<td>&lt; 90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90-94</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>Cyanosis</td>
<td>[Y/N]</td>
<td>Jaundice</td>
<td>[Y/N]</td>
<td>Palor [Y/N]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key</td>
<td>SEVERE</td>
<td>Instant Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROBLEM</td>
<td>Consult or repeat observation in 30 minutes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORMAL</td>
<td>Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.2. Random Blood Sugar Monitoring (RBS) Form

This form serves to capture the blood sugar measurements of the baby and the interventions put in place. Recording this information helps in caring for a baby in the sick newborn area who needs regular monitoring of the blood sugar (e.g., a preterm baby). It can serve also for the well baby whose mother is not yet able to fully lactate.

**RANDOM BLOOD SUGAR MONITORING (RBS) FORM**

<table>
<thead>
<tr>
<th>NAME: __________________</th>
<th>AGE: ______</th>
<th>SEX: _____</th>
<th>WARD: __________</th>
<th>FOLDER NO: ______</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DATE</strong></td>
<td><strong>TIME</strong></td>
<td><strong>RBS</strong></td>
<td><strong>ACTION</strong></td>
<td><strong>REMARK</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


6.3. Seizure Chart

The seizure chart is for use in the sick newborn area to monitor a baby who has seizures. The seizure chart captures the area of the body involved in a seizure, the time and duration of the episode, and the actions or interventions put in place.

**SEIZURE CHART**

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>DURATION</th>
<th>PART(S) OF BODY INVOLVED</th>
<th>ACTION/REMARK</th>
<th>NAME OF SERVICE PROVIDER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NAME: ____________________  AGE: _____  SEX: _____  WARD: _____  FOLDER NO: _____
### 6.4. Newborn IV Fluids/Feeding Chart (Input Chart)

This chart is for use in the sick newborn area to monitor the fluid input for the sick newborn. The information to record on the chart includes the types and amounts of intravenous fluids, and the breast feeds or other feedings of breast milk. Personnel should record any feeding problems they identify as well. They should also indicate the total amounts of fluids given and the total feeds in 24 hours on the forms.

**NEWBORN IV FLUIDS/FEEDING CHART**

Name: _______________ Age on admission ________ Birth weight: ________ Ward: ________

Term _______ Preterm _______ LBW: _______

<table>
<thead>
<tr>
<th>DAY/DATE</th>
<th>TIME</th>
<th>IV FLUIDS</th>
<th>FEEDS</th>
<th>REMARKS/ ACTIONS TAKEN</th>
<th>NAME AND SIGNATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total volume of fluid required /24 hrs</td>
<td>Feeding instructions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DAY/DATE</td>
<td>Time</td>
<td>Type and volume set up</td>
<td>mls/hr or drops per min</td>
<td>Volume received</td>
<td>Type of feed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total fluids given in 24 hours:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total feeds in 24 hours:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.5. Newborn Output Chart

The newborn output chart captures information on the baby such as the age on admission, the birth weight, and the folder number of the baby. Personnel should note the volume and colour of any vomitus and gastric aspirate. If urine can be assessed objectively it should also be documented; otherwise, the wetting of diapers is to be noted. The consistency and colour of stool passed (e.g., black, normal, bloody) should be documented per assessment.

Staff should capture the total amount of output passed by the baby in 24 hours and should note any other remarks or actions taken.

### NEWBORN OUTPUT CHART

<table>
<thead>
<tr>
<th>DAY</th>
<th>DATE</th>
<th>TIME</th>
<th>VOMITING</th>
<th>GASTRIC ASPIRATE</th>
<th>URINE</th>
<th>STOOL PASSED (TICK IF YES)</th>
<th>REMARKS/ ACTION</th>
<th>NAME/ SIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>VOLUME</td>
<td>VOLUME</td>
<td>VOLUME</td>
<td>VOLUME</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>COLOUR</td>
<td>COLOUR</td>
<td>URINE PASSED (MLS)</td>
<td>WET DIAPER</td>
<td>COLOUR/ CONSISTENCY (normal/black/bloody)</td>
<td></td>
</tr>
</tbody>
</table>

### TOTAL IN 24 HRS

<table>
<thead>
<tr>
<th>NAME:</th>
<th>AGE ON ADMISSION (HRS/DAYS)</th>
<th>SEX</th>
<th>BIRTH WEIGHT</th>
<th>WARD</th>
<th>TERM</th>
<th>PRETERM</th>
<th>LBW</th>
<th>FOLDER NO.</th>
</tr>
</thead>
</table>

STANDARDS FOR NEWBORN HEALTH SERVICES IN GHANA
6.6 Newborn Examination Form

Every baby in a facility must be examined by 90 minutes of age, and before discharge, whether they are born within the facility or in another facility. Findings must be documented on the appropriate forms.

The newborn examination form documents in detail all the physical findings of the baby. The forms are designed to pick up danger signs such as fast breathing and chest in-drawing, among others. Babies with danger signs must be referred urgently to the sick newborn area for effective treatment.

The form also helps to identify congenital abnormalities that may not be life threatening but will need management, such as cleft lip.

The forms also can capture information on the extent of any resuscitation done for the baby and whether the baby received essential care services such as eye care, cord care, etc. They also record important information about the mother that may affect care for the baby such as the mother’s blood group, HIV status, hepatitis B status, or other condition.

### NEWBORN EXAMINATION FORM AT BIRTH

**TICK AS APPROPRIATE**

<table>
<thead>
<tr>
<th>Baby’s Name:</th>
<th>Date:</th>
</tr>
</thead>
</table>

**Date of Birth:**

**Time of Birth:**

**Sex:** M [ ] F [ ]

**Gestational Age:**

**APGAR:** 1min [ ] 5min [ ]

**Length:**

**Head Circumference:**

**Birth Weight:**

**Temperature at Time of Examination:**

**Urine passed:** Yes [ ] No [ ]

**Meconium passed:** Yes [ ] No [ ]

**Mode of Delivery:** Vaginal [ ] Assisted Vaginal [ ] C-Section [ ] Name of Health Worker:

#### 1. Respirations

**Rate:**

- [ ] Rate < 30 b/m²
- [ ] Rate ≥ 60 b/m²
- [ ] 30-60 b/m² (normal)
- [ ] Cephalohematoma
- [ ] Subgaleal haemorrhage
- [ ] No breathing
- [ ] Other:

**Activity/Movement**

- [ ] Spontaneous symmetrical movement
- [ ] Reduced/absent movement in one or more limbs
- [ ] Seizure/abnormal movement
- [ ] No movement

#### 2. Colour

- [ ] Normal
- [ ] Fio
dy
- [ ] Increased
- [ ] Pink all over
- [ ] Pink body but blue hands/feet
- [ ] Blue all over
- [ ] Pale
- [ ] Jaundiced

#### 3. Cord

- [ ] Normal
- [ ] Red skin around cord
- [ ] Draining pus
- [ ] Bleeding

#### 4. Skin

- [ ] Normal
- [ ] Pustules
- [ ] Rash
- [ ] Other:

#### 5. Cry

- [ ] Normal
- [ ] Shriek
- [ ] Absent

#### 6. Suck

- [ ] Good
- [ ] Weak
- [ ] Absent

#### 7. Head - Swelling/Injuries

- [ ] Cephalohematoma
- [ ] Subgaleal haemorrhage
- [ ] Facial abrasions
- [ ] No swelling
- [ ] Other:

#### 8. Cranial Sutures

- [ ] Normal
- [ ] Overlapping
- [ ] Fused
- [ ] Widely separated

#### 9. Fontanelle

- [ ] Normal
- [ ] Sunken
- [ ] Bulging
- [ ] Wide (>5cm)

#### 10. Eyes

- [ ] Normal
- [ ] Subconjunctival bleed
- [ ] White pupil or cornes
- [ ] Eye discharge
- [ ] Other:

#### 11. Ears

- [ ] Normal
- [ ] Abnormal:

#### 12. Mouth

- [ ] Normal
- [ ] Cleft palate
- [ ] Cleft lip
- [ ] Other:

#### 13. Neck

- [ ] Normal
- [ ] Swelling
- [ ] Webbed
- [ ] Other:

#### 14. Clavicle

- [ ] Normal
- [ ] Swelling/Fracture

#### 15. Chest

- [ ] Normal
- [ ] Swaying/movement

#### 16. Heart rate

- [ ] Normal
- [ ] Abnormal
- [ ] Rate:

#### 17. Femoral Pulse

- [ ] Normal
- [ ] Not palpable

#### 18. Abdomen

- [ ] Normal
- [ ] Abdominal defect
- [ ] Masses:
- [ ] Other:

#### 19. Back (spine)

- [ ] Normal
- [ ] Abnormal:

#### 20. Limbs and digits

- [ ] Normal
- [ ] Abnormal:

#### 21. Genitalia

- [ ] Normal
- [ ] Ambiguous
- [ ] Other:

#### 22. Male Genitalia

- [ ] Normal
- [ ] Undescended testes
- [ ] Abnormal meatus
- [ ] Hernia
- [ ] Other:

#### 23. Female Genitalia

- [ ] Normal
- [ ] Fistula (meconium/urine through abnormal opening in vagina)
- [ ] Large clitoris
- [ ] Other:

#### 24. Resuscitation provided

- [ ] None
- [ ] Suction/stimulation
- [ ] Bag and mask
- [ ] Endotracheal tube
- [ ] Ventilators/CPAP

#### 25. Services provided

- [ ] Vitamin K
- [ ] Eye care
- [ ] Cord care
- [ ] Breastfeeding initiated
- [ ] Breastfeeding established
- [ ] BCG
- [ ] Polio Immunization
- [ ] Hepatitis B immunization
- [ ] Other medicines

### Diagnoses (if known)

**Classification (Overall assessment):**

- [ ] Normal
- [ ] Baby With a Problem
- [ ] Danger Sign / <1800 g / Severe Jaundice

**Plan:**

- [ ] Routine Care
- [ ] Problem: Continue supportive in-patient care
- [ ] Urgent Referral/Advanced Care
- [ ] Discharge
### 6.7 Healthy Newborn Monitoring Form

Monitoring every baby born in a health care facility, is essential to ensure the baby’s wellness and to detect any danger sign or change in vital signs as early as possible for prompt intervention.

This form is for use in the lying-in room after delivery and may even serve in a well-baby area to monitor a baby whose mother is unstable. This monitoring should last for at least 24 hours but may continue for as long as the well baby is within the facility.

#### WELL-BABY MONITORING FORM

<table>
<thead>
<tr>
<th>Name</th>
<th>Date/time of delivery</th>
<th>Delivery register No</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>MONITOR</th>
<th>FIRST 1 HOUR: every 15 mins</th>
<th>NEXT 23 HOURS: every 4hrs</th>
<th>COMMENTS</th>
<th>NAME/ SIGNATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>15’</td>
<td>30’</td>
<td>45’</td>
<td>60’</td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest in-drawing, Yes/No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>Pink</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jaundiced</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breastfeeding (Yes/No)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.8 Newborn Head Ticket

When newborns are referred from the labour ward to the sick newborn area, much information is required to enable the health care workers receiving the baby to provide quality care.

Details such as the time membranes ruptured, the condition of the liquor, and the baby’s Apgar score impact on the treatment the baby should receive. Thus, this form must accompany every baby sent to the sick newborn area or even when the baby transfers from one facility to another.

Mother’s name: ..................................................................................................................................................................

Address: ...........................................................................................................................................................................

Contact number: ..............................................................................................................................................................

Mother’s age: .............................................  Parity: ...........................................................................................................

Gestational age: ...........................................

Date of delivery: .....................................  Time of delivery: ............................................................................................

Sex: Male/Female: ..........................................

Birth weight (kg): .................  Presentation: ......................................................................................................................

Duration of 1st stage: ...............  Duration of 2nd Stage: .............................................................................................

Time of rupture of membranes: ...........  Spontaneous/Artificial: ..............................................................................

Condition of liquor:

Mode of Delivery: SVD/Vacuum extraction/ Caesarean section

Reason for C/S: ..............................................................................................................................................................

Cord around neck Yes/No  Any knots on cord? Yes/No

Did baby cry at birth? Yes/No

Apgar score; 1min: .......................  5min: ....................................................................................................................

Was baby resuscitated? Yes/ No

If Yes: Stimulation/Suction/Bag and Mask/Oxygen/other

Delivery done by (Name): ...........................................................................................................................................

Maternal complications if any: ....................................................................................................................................

Drugs given to mother: ....................................................................................................................................................

Reason for referral: ..........................................................................................................................................................

Any other information: ....................................................................................................................................................

Referring facility: ............................................................................................................................................................

Referred to: .................................................................................................................................................................

Name of referring staff: ..................................................................................................................................................

Signature ........................................................................................................................................................................

Date........................................................................................................  Time............................................................................
# ANNEX 1

## Items Required for Hand Hygiene, PPE, and General Cleaning

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>ITEMS</th>
<th>CHPS/HEALTH CENTER/ MATERNITY HOMES</th>
<th>DISTRICT HOSPITALS/ OTHER HOSPITALS</th>
<th>REGIONAL HOSPITALS</th>
<th>TERTIARY HOSPITALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hand Hygiene - Soap and water</strong></td>
<td>Cake soap cut into small bits</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Liquid soap</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Perforated soap dish</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Single use clean towel</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Running water (tap or veronica bucket)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Container for clean towels (with opening at bottom)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Containers for used linen</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Hand Hygiene - Hand sanitizer</strong></td>
<td>Alcohol rub (60%–95% alcohol content)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Personal Protective Equipment (PPE)</strong></td>
<td>Cap</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Mask</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Eye protection</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Apron</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Protective boots</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Heavy duty gloves/long gloves</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Waste disposal</strong></td>
<td>Refer to Ghana IPC policy and guideline 2015 (MOH)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Safe injection practices</strong></td>
<td>Refer to Ghana IPC policy and guideline 2015 (MOH)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>General cleaning NICU</strong></td>
<td>Sweeping brush</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Ceiling brush</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Mop and mop bucket</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Duster</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Heavy duty gloves/long gloves</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Laundry baskets for dirty linen and for clean linen</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Cleaning Solutions</strong></td>
<td>Detergent/plain soap</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>0.5% chlorine solution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Refer to Ghana IPC policy and guideline 2015 (MOH)
# ANNEX 2
Reprocessing of Resuscitation Equipment

<table>
<thead>
<tr>
<th>STEPS</th>
<th>Materials and Equipment</th>
<th>CHPS/HEALTH CENTER/MATERNITY HOMES</th>
<th>DISTRICT HOSPITALS/OTHER HOSPITALS</th>
<th>REGIONAL HOSPITALS</th>
<th>TERTIARY HOSPITALS</th>
</tr>
</thead>
</table>
| 1. IMMEDIATE PRE-CLEANING | - Chlorine solution 0.5%  
- Small plastic container (1 L) with a tight-fitting lid  
- Clean gauze/cloth  
- Personal protective equipment (PPE) | ✔ | ✔ | ✔ | ✔ |
| 2. CLEANING | - Soapy water (use mild liquid soap)  
- Large plastic container (10 to 20 L bucket, with tight-fitting lid)  
- Small, soft brush (e.g., toothbrush)  
- New, clean gauze/cloth  
- Toothpick  
- PPE | ✔ | ✔ | ✔ | ✔ |
| 3. RINSING AFTER CLEANING | - Sink with clean running water OR  
- Large plastic container (10 to 20 L bucket, with tight-fitting lid) with clean water  
- PPE | ✔ | ✔ | ✔ | ✔ |
| 4. DRYING AFTER CLEANING | Needed only before sterilization or chemical high-level disinfection (HLD)  
- Clean cloth or gauze  
- PPE | ✔ | ✔ | ✔ | ✔ |
| 5. DISINFECTION STAGE | | | | | |
| 5.1 STERILISATION | - Electric steriliser  
- Alternative: non-electric sterilizer  
- Sterilisation log  
- Timer/clock/watch  
- Wrap (if necessary): Cotton cloth or other porous material  
- Linen ties or masking tape to secure packs  
- PPE | ✔ | ✔ | ✔ | ✔ |
| 5.2 HIGH-LEVEL DISINFECTION (HLD) | | | | | |
| 5.2.1 BOILING | Boiling apparatus:  
- Boiling machine with lid and electricity source  
- Pot with lid and heat source  
- Clean water (filtered if necessary)  
- HLD log  
- Timer/clock/watch  
- High-level disinfected forceps  
- PPE | ✔ | ✔ | ✔ | ✔ |
| 5.2.2 STEAMING | - Steamer pan with lid. Must be deep enough to ensure that largest items will fit inside without creating a gap between the pans when they are stacked.  
- Second pan (no holes) for drying process  
- Heat source  
- Clean water (filtered if necessary)  
- HLD log  
- Timer/clock/watch  
- High-level disinfected forceps  
- PPE | ✔ | ✔ | ✔ | ✔ |
| 6. DRYING | - Air dry OR  
- Wiping with sterile gauze (wear sterile gloves) | ✔ | ✔ | ✔ | ✔ |
| 7. STORAGE | - HLD plastic container with a lid OR  
- Sterilized or autoclaved metal container | ✔ | ✔ | ✔ | ✔ |
ANNEX 3

Isolation of the Newborn with Infectious Disease

For general guidelines on isolation see Ghana IPC Policies and Guidelines 2015.

Infection control measures in the NICU often include transmission-based precautions to decrease horizontal transmission from infants who are infected or colonized with infectious agents to those who are not infected or colonized. These include contact precautions, droplet precautions, airborne infection precautions, as well as isolation or cohorting of patients.

Isolation refers to the care of infants in separate rooms or other confined areas that are physically separated from other infants.

Cohorting is the physical segregation of infants in separate areas where designated staff care exclusively for newborns with similar exposures, colonization, or infections.

In many instances (notable exceptions are neonatal varicella zoster virus infection or epidemics of bacterial infection), infected newborns do not need to be in a separate room, if certain criteria are met:

i  sufficient medical and nursing staff are on duty,
ii  sufficient space exists between stations,
iii  two or more sinks for handwashing are available in each nursery area, and
iv  staff receive continuing instruction regarding the way infections spread.

Cohorting of children infected with the same pathogen is acceptable if a single-patient room is not available, a facility maintains a distance of more than 1m between patients, and staff observe precautions between all contacts with different patients in the room.

Congenital Infections
Standard precautions provide adequate isolation for most congenital infections, with two exceptions: 1) congenital rubella, which requires droplet isolation (surgical masks), and 2) suspected herpetic infection, which requires contact isolation (gowns, gloves).

Viral Infections
Newborns who present with a rash and high-grade fever (possible indicators of severe viral infections transmitted by the airborne route) should be separated from other infants by transfer from the nursery area, rooming-in with the mother.

Multidrug-Resistant (MDR) Organisms
Staff should isolate infants infected with MDR organisms or MRSA and should also observe contact precautions.
### Isolation Categories

<table>
<thead>
<tr>
<th>Modes of transmission of Infectious agents</th>
<th>Category of Precautions</th>
<th>Single-Patient Room Isolation or Rooming-in with mother outside newborn area</th>
<th>Respiratory Tract and Mucous Membrane Protection</th>
<th>Gowns</th>
<th>Gloves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airborne transmission</td>
<td>Airborne</td>
<td>Yes</td>
<td>Yes</td>
<td>No*</td>
<td>No*</td>
</tr>
<tr>
<td>• Mycobacterium tuberculosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Measles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Varicella-zoster virus (chickenpox)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Droplet transmission</td>
<td>Droplet</td>
<td>Yes**</td>
<td>Surgical masks ***</td>
<td>No*</td>
<td>No*</td>
</tr>
<tr>
<td>• Bordetella pertussis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Influenza virus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Adenovirus and rhinovirus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mycoplasma pneumoniae</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Group A Streptococcus</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Neisseria meningitidis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact transmission (Direct/Indirect)</td>
<td>Contact</td>
<td>Yes**</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>• Herpes simplex virus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Respiratory syncytial virus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Staphylococcus aureus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Enteroviruses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Gowns and gloves may be required as a component of standard precautions (e.g., for blood collection or during procedures likely to cause blood splashes or if there are skin lesions containing transmissible infectious agents).

** Preferred. Cohorting of children infected with the same pathogen is acceptable if a single-patient room is not available, a distance of more than 3 feet between patients can be maintained, and precautions are observed between all contacts with different patients in the room.

*** Masks should be donned on entry into the room.
# ANNEX 4

## Laboratory Services for Different Levels of Care

<table>
<thead>
<tr>
<th>LABORATORY TESTS</th>
<th>CHPS</th>
<th>LEVEL OF CARE HEALTH CENTRE</th>
<th>DISTRICT HOSPITAL</th>
<th>REGIONAL HOSPITAL</th>
<th>TERTIARY HOSPITAL</th>
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<tbody>
<tr>
<td>HIV Testing</td>
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<td></td>
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<tr>
<td>HIV virological diagnostic testing (RNA/DNA) Polymerase chain reaction (PCR)/Early Infant Diagnosis</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>HIV viral load measurement</td>
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<td></td>
<td></td>
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<td>✓</td>
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<tr>
<td>CD4</td>
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<td></td>
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<tr>
<td><strong>Haematology assays</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemoglobinometer such as HemoCue</td>
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<td>✓</td>
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<td>Full blood count</td>
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<td>✓</td>
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<td>Blood grouping and cross-matching</td>
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<td>✓</td>
<td>✓</td>
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<td>G6PD</td>
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<td>✓</td>
<td>✓</td>
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<td>Coombs test</td>
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<td>Reticulocyte count</td>
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<td>Platelets</td>
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<tr>
<td>Blood film</td>
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<td>✓</td>
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<tr>
<td>Metabolic screen</td>
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<td>✓</td>
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<td><strong>Chemistry assays</strong></td>
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<tr>
<td>Liver function tests</td>
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<td></td>
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<td>Whole blood glucose (glucometer)</td>
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<td>✓</td>
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<td>Serum glucose</td>
<td></td>
<td></td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Serum electrolytes</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Renal function tests</td>
<td></td>
<td></td>
<td></td>
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<td>✓</td>
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<tr>
<td>Blood urea electrolytes and creatinine</td>
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<tr>
<td>Lipids</td>
<td></td>
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<td>✓</td>
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<tr>
<td>Amylase</td>
<td></td>
<td></td>
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<tr>
<td>Lactate</td>
<td></td>
<td></td>
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<tr>
<td>Clotting profile</td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td>Serum calcium, phosphates, magnesium</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Serum bilirubin</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Blood gas analysis</td>
<td></td>
<td></td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Hormones:</td>
<td></td>
<td></td>
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<tr>
<td>Thyroid function test</td>
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<td>✓</td>
</tr>
<tr>
<td>Other hormonal assays</td>
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</tr>
<tr>
<td><strong>Pathology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
## Laboratory Tests and Levels of Care

<table>
<thead>
<tr>
<th>Test</th>
<th>Newborn Hearing Center</th>
<th>Outpatient Clinic</th>
<th>General Admission Ward</th>
<th>Psychiatry Ward</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urine analysis</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>Urine dipstick</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Urine dipstick with microscopy</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Stool microscopy</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Tuberculosis tests</strong></td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<tr>
<td>Microscopy (Sputum for acid-fast bacilli)</td>
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<td>✓</td>
<td>✓</td>
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</tr>
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<td>Culture and ID</td>
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</tr>
<tr>
<td>Drug susceptibility test (GeneXpert)</td>
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<tr>
<td><strong>Malaria tests</strong></td>
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<td>Rapid test for malaria</td>
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<td>✓</td>
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</tr>
<tr>
<td>Microscopy for malaria (thick/thin)</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Microbiology tests</strong></td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Gram stain for blood, urine, CSF, stool</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Microbiology culture</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Blood, urine, CSF pleural aspirate, wound swab, other body fluids</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td><strong>Syphilis tests</strong></td>
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<td>Syphilis rapid diagnostic test</td>
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<td>Syphilis serological (RPR, FTA, TPPA/TPHA)</td>
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<td>Hepatitis B by EIA</td>
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<td>Hepatitis C by EIA</td>
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<td><strong>Other viral serology</strong></td>
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<td><strong>Cerebrospinal fluid (CSF) tests</strong></td>
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<td>✓</td>
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<td>Gram stain and AFB</td>
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<tr>
<td>CSF biochemistry (glucose, protein)</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Cryptococcal antigen (serum or CSF)</td>
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<td><strong>Imaging</strong></td>
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<td>Plain X-rays</td>
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<td>Electrocardiography</td>
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<td>MRI scan</td>
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<tr>
<td>Hepatobiliary and other radiotracer scans</td>
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</tr>
</tbody>
</table>

Other Ghana Health Service documents describe staffing norms, design and layout, bed numbers, technical specifications, as well as standard operating procedures and guidelines.
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Ghana Health Service - Family Health Division Document, supported by Breakthrough ACTION with funding from USAID.