Standards for Obstetric and Neonatal Services

Version 2

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Health Policies and Standards Department

Health Regulation Sector (2024)

INTRODUCTION

Health Regulation Sector (HRS) forms an integral part of Dubai Health Authority (DHA) and is mandated by DHA Law No. (14) of the year (2021) amending some clauses of law No. (6) of 2018 pertaining to the Dubai Health Authority (DHA), to undertake several functions including but not limited to:

- Developing regulation, policy, standards, guidelines to improve quality and patient safety and promote the growth and development of the health sector;
- Licensure and inspection of health facilities as well as healthcare professionals and ensuring compliance to best practice;
- Managing patient complaints and assuring patient and physician rights are upheld;
- Governing the use of narcotics, controlled and semi-controlled medications;
- Strengthening health tourism and assuring ongoing growth; and
- Assuring management of health informatics, e-health and promoting innovation.

The Standards for Obstetric and Neonatal Services aims to fulfil the following overarching DHA Strategic Priorities (2026):

- Pioneering Human-centered health system to promote trust, safety, quality and care for patients and their families.
- Leading global efforts to combat epidemics and infectious diseases and prepare for disasters.
- Pioneering prevention efforts against non-communicable diseases.
- Foster healthcare education, research and innovation.

ACKNOWLEDGMENT

The Health Policy and Standards Department (HPSD) developed this Standard in collaboration with Subject Matter Experts and would like to acknowledge and thank these health professionals for their dedication toward improving quality and safety of healthcare services in the Emirate of Dubai.

Health Regulation Sector

Dubai Health Authority

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EXECUTIVE SUMMARY

Dubai Health Authority (DHA) is pleased to present the Standards for Obstetric and Neonatal Services which represents a milestone towards fulfilling DHA's strategic objectives to create a pioneering Human-centered health system to promote trust, safety, quality and care for patients and their families. These standards will assure healthcare professionals and health facilities providing obstetric and neonatal care to ensure achievement of optimal health outcomes, and the best level of care and safety for the mother and baby. Emphasis has been placed on the levels of care, inclusion of special care rooms, fall management, medication management, medical records, patient discharge and performance metrics to guide services and healthcare professionals to safe, high quality services.

The key updates in Version 2 are set out below:

1. Updated definitions of levels of obstetric and neonatal care
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DEFINITIONS

Airborne Infection Isolation (AII) rooms refers to rooms maintained negative pressure and used for patients requiring isolation for airborne droplet infections. Patients placed in such rooms to reduce transmission of disease via the airborne route.

Antenatal care refers to the clinical assessment of mother and fetus during pregnancy, for obtaining the best possible outcome for the mother and child. Also known as prenatal care or antepartum care.

Antenatal record card shall mean a card, which comprises of complete medical and obstetric history of the expected mother and advised to be carried by them at all times during pregnancy. Also known as co-operation card.

Antepartum care refers to care received from healthcare professionals for pregnant women before childbirth

Apgar score refers to a quick, overall assessment of newborn well-being and is used immediately following the delivery of a baby. Test scores are recorded at one minute and five minutes from the time of birth.

Ballard score refers to sets of procedures that determine gestational age through neuromuscular and physical assessment of a newborn infant.

Critical Congenital Heart Defects (CCHD) screen refers to an evaluation test using pulse oximetry that usually done when a baby is 24 to 48 hours of age to detect heart defects that cause serious life-threatening symptoms.

Hearing test refers to hearing assessment of babies after birth for early detection of hearing loss.

High dependency unit is an area in a hospital, usually located closely to the intensive care unit, where patients can be cared for more extensively than on a normal ward, but not to the point of intensive care and for those with single-organ failure.

High-risk neonate shall mean newborn regardless of gestational age or birth weight, who has a greater-than average chance of morbidity or mortality.

Intrapartum care refers to care received from healthcare professionals for pregnant women and their babies during childbirth.

Labor is a series of continuous, progressive contractions of the uterus that help the cervix dilate and efface (thin out). This allows the fetus to move through the birth canal.

- First stage of labor: starts when labor begins and ends with the full cervical dilation and effacement to 10 centimeters.
- Second stage of labor: starts with the complete cervical dilation to 10 centimeters and ends with the delivery of the neonate.
- Third stage of labor: starts after the fetus is delivered and ends with the placenta delivered.

Labor delivery recovery postpartum shall mean a birthing room or suite equipped to allow patient remain in the same room throughout the birthing experience and into the postpartum period.

Labor delivery recovery shall mean a birthing room or suite so equipped that a patient can remain in the same room throughout the birthing experience.

Newborn infant OR neonate refers to newborn up to first twenty eight (28) days of life.

Neonatal care shall mean care given to the newborn babies from birth to twenty eight (28) days of age. The level of neonatal care describes the type.

Neonatal death refers to numbers of deaths during the first twenty eight (28) completed days of life.

Neonatal Resuscitation shall mean establishment of an airway and providing ventilation, to be sure that there is breathing, and make certain that there is adequate circulation of oxygenated blood, through an official resuscitation program.

Neonatal screening shall mean tests of newborn to screen serious developmental, genetic, and metabolic disorders, most of these illnesses are very rare, but can be treated if caught early.

Obstetric care (or Maternity care) refers to all aspects of antenatal, intrapartum, and postnatal care of pregnant woman.

Postnatal (postpartum) care refers to care received from healthcare professionals for women after childbirth.

Reference laboratory shall analyze blood samples taken from newborns, prepare necessary reports related to the samples received, and send back the examination results to the health facility.

Stillbirth shall mean any fetal death where a birth weight of 500 grams and above or a gestational age of 24 weeks and above.

ABBREVIATIONS

ACLS	:	Advanced Cardiovascular Life Support
AII	:	Airborne Infection Isolation
AN	:	Assistant Nurse
AM	:	Assistant Midwife
BCG	:	Bacilli Calmette-Guérin
BLS	:	Basic Life Support
CCHD	:	Critical Congenital Heart Disease
CT	:	Computed Tomography
CTG	:	Cardiotocography
DHA	:	Dubai Health Authority
ECG	:	Electrocardiogram
FGI	:	Facility Guidelines Institute
GP	:	General Practitioner
HIV	:	Human Immunodeficiency Virus
HRS	:	Health Regulation Sector
ICU	:	Intensive Care Unit
ID	:	Identification
IV	:	Intravenous
LDR	:	Labor Deliver Recovery
LDRP	:	Labor Deliver Recovery Postpartum

MFM	:	Maternal-Fetal Medicine
MRI	:	Magnetic Resonance Imaging
NBS	:	Newborn screening
NG	:	Nasogastric
NICU	:	Neonatal Intensive Care Unit
NRP	:	Neonate Resuscitation Program
OG	:	Orogastric
PPE	:	Personal Protective Equipment
PQR	:	Professionals Qualification Requirements
RM	:	Registered Midwife
RN	:	Registered Nurse
ROP	:	Retinopathy of prematurity
TPN	:	Total Parental Nutrition
UAE	:	United Arab Emirates
WHO	:	World Health Organization

1. BACKGROUND

Over the past forty (40) years, there has been a steady improvement in the provision of care during pregnancy and labor in the Emirate of Dubai, acknowledging that maternal and infant mortality are major indicators of health system performance, great emphasis was made to minimize the negative clinical outcomes. Despite all the developments in maternal and neonatal care, stillbirth rate has not declined to the same extent as that of neonatal deaths, and there is still a significant level of infant mortality and disability; however, inequalities in access to women's health care, lack of uniform standards and data collection systems still exist. Studies show that timely access to risk-appropriate maternal and neonatal care can reduce perinatal mortality.

Obstetric services can be divided into antenatal, intrapartum, and postnatal care. In order to standardize and uniform the care levels in the Emirates of Dubai; DHA adapt the following classification of obstetric and neonatal care. Health facilities providing or opting to provide intrapartum obstetric services shall maintain neonatal care units equivalent to the level of obstetric care provided.

2. SCOPE

2.1. Obstetric and Neonatal Services in DHA licensed health facilities.

3. PURPOSE

3.1. To assure provision of the highest levels of safety and quality Obstetric and Neonatal Services in Dubai Health Authority (DHA) licensed health facilities.

4. APPLICABILITY

4.1. DHA licensed healthcare professionals and health facilities providing Obstetric and Neonatal Services.

5. STANDARD ONE: REGISTRATION AND LICENSURE PROCEDURES

5.1. All health facilities providing obstetric and neonatal services shall adhere to the United Arab Emirates (UAE) Laws and Dubai regulations.

5.2. Health facilities aiming to provide obstetric and neonatal shall comply with the DHA licensure and administrative procedures available on the DHA website https://www.dha.gov.ae.

5.3. Licensed health facilities opting to add obstetric and neonatal services shall apply through sheryan add-on service to obtain permission to provide obstetric and neonatal services.

5.4. The health facility should develop the following policies and procedure; but not limited to:

5.4.1. Patient acceptance criteria

5.4.2. Patient assessment and admission

5.4.3. Patient education and Informed consent

5.4.4. Patient health record

5.4.5. Infection control measures and hazardous waste management

5.4.6. Incident reporting

5.4.7. Patient privacy

5.4.8. Medication management

5.4.9. Emergency action plan

5.4.10. Patient discharge/transfer.

5.5. Health facilities providing obstetric and neonatal care shall develop and implement a policy for falls management.

5.6. All health facilities shall develop and implement policies and procedures for medication management based on the following principles:

5.6.1. Appropriate selection of therapeutic management option (not always pharmaceutical)

5.6.2. Suitable choice of medications

5.6.3. Safe and effective use of medications by the following:

a. Allergies and sensitivities information

b. Knowledge of the actions, interactions, usual dose (calculation), route, and side effects of the medications

5.7. The health facility shall provide documented evidence of the following:

5.7.1. Transfer of critical/complicated cases when required

5.7.2. Patient discharge

5.7.3. Clinical laboratory services

5.7.4. Equipment maintenance services

5.7.5. Laundry services

5.7.6. Medical waste management as per Dubai Municipality (DM) requirements

5.7.7. Housekeeping services.

5.8. Each health facility shall maintain records and reports in a manner to ensure accuracy and easy retrieval.

5.9. The health facility shall maintain charter of patients' rights and responsibilities posted at the entrance of the premises in two languages (Arabic and English).

5.10. The health facility shall have in place a written plan for monitoring equipment for electrical and mechanical safety, with monthly visual inspections for apparent defects.

5.11. The health facility shall ensure it has in place adequate lighting and utilities, including temperature controls, water taps, medical gases, sinks and drains, lighting, electrical outlets and communications.

6. **STANDARD TWO:** HEALTH FACILITY REQUIREMENTS

6.1. DHA permits antenatal/postnatal services to be performed in the following health facilities:

6.1.1. General hospitals

6.1.2. Specialized hospitals with obstetrics and gynecology specialty

6.1.3. Outpatient facilities including primary health centres

6.2. DHA permits intrapartum services to be performed only in:

6.2.1. General hospitals

6.2.2. Specialized hospitals with Obstetrics and Gynecology specialty

6.3. The health facility should meet the health facility requirements as per the DHA Health Facility Guidelines (HFG), Part B: Health Facility Briefing & Design, Maternity Unit.

6.4. The Maternity Unit (Obstetric unit) provides facilities for:

6.4.1. Antenatal care of mothers with complications during pregnancy

6.4.2. Assessment, management of labour, delivery and immediate post-delivery observation of mothers

6.4.3. Postnatal care of mothers following birth – complicated or uncomplicated deliveries

6.4.4. Neonatal care by mothers under supervision from nursing and midwifery trained staff

6.4.5. Neonatal care of new-born's requiring special care from specialist neonatal medical and nursing staff.

6.5. The Maternity Unit incorporates:

6.5.1. Birthing Unit

6.5.2. Inpatient accommodation – Antenatal

6.5.3. Inpatient accommodation – Postnatal

6.5.4. Nurseries:

a. Well Baby Nursery (WBN) or General Care Nursery (GCN)

b. Special Care Baby Unit (SCBU) or Special Care Nursery (SCN)

c. NICU (Neonatal Intensive Care Unit) - which may be co-located with other Intensive Care Units and should be separate from the Maternity Unit.

6.6. The maternity Unit must operate on a 24 hour per day basis, with admissions at any time of the day or night.

6.7. The maternity unit shall be located and designed to prohibit non-related traffic through the unit.

6.8. Labour Deliver Recovery (LDR) rooms may be located in a separate LDR suite, in close proximity to the caesarean delivery suite.

6.9. Antenatal (antepartum) rooms shall be single-patient rooms, and should be at least 3.65 meters wide by 3.96 meters deep exclusive toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules.

6.10. The LDR or LDRP room should be equipped with the following:

6.10.1. Delivery bed

6.10.2. Birthing light

6.10.3. Medical gas and vacuum system accessible to the mother's delivery area and infant resuscitation

6.10.4. Nurse call system

6.10.5. Telephone or communication system

6.10.6. Sixteen (16) Electric receptacles (8 convenient to head of bed with one on each wall and four (4) convenient to each bassinet with one on each wall).

6.10.7. Hand washing station

6.10.8. Medical and general waste bin

6.10.9. Sharps container

6.11. A minimum of one caesarean delivery room shall be provided for every obstetrical unit unless direct access for caesarean delivery procedures is provided in surgical operation room.

6.12. New-born nursery room (if provided) should contain no more than sixteen (16) infant stations.

6.13. Support areas for obstetric unit should consist of the following:

6.13.1. Nurse station with dedicated documentation area

6.13.2. Secured medication safety zone

6.13.3. Nourishment area

6.13.4. Clean workroom or clean supply room

6.13.5. Soiled workroom or soiled holding room

6.13.6. Equipment and supply storage

6.13.7. Housekeeping services room

6.13.8. Hand washing station (including wall-mounted hand washing soap (non-refillable), sanitizer (non-refillable) and tissue box.

6.13.9. Examination/treatment and/or multipurpose diagnostic testing room (if required)

6.13.10. Clean linen cabinet

6.13.11. Staff changing room / staff resting room

7. **STANDARD THREE:** OBSTETRIC SERVICE REQUIREMENTS

7.1. Antenatal care can be provided by the following healthcare professionals only:

7.1.1. DHA licensed Consultant/Specialist Obstetrics and Gynecology.

7.1.2. DHA licensed Consultant/Specialist Family Medicine,

7.1.3. A DHA licensed registered midwife (RM) or assistant midwife (AM) or registered nurse (RN) or assistant nurse (AN), at a ratio of 1:1 (one nurse for each physician)

7.2. To provide antenatal care the facility should have the following equipment:

7.2.1. Vital signs Monitor

7.2.2. Fetoscope

7.2.3. Electrocardiogram (ECG)

7.2.4. Cardiotocography (CTG)

7.2.5. Ultrasonography

7.2.6. Access to laboratory testing

7.2.7. Emergency crash cart with proper supplies and medication.

7.3. All health facilities providing obstetric services shall maintain regular audits for compliance of the following:

7.3.1. Episiotomies

7.3.2. 3rd degree tears

7.3.3. Induction of labour

7.3.4. Instrument deliveries

7.3.5. Postpartum hemorrhage

7.3.6. Perinatal mortality and morbidity

7.3.7. Vaginal/Caesarean rates

7.3.8. Vaginal birth after caesarean (VBAC)

7.4. For Obstetric Levels of Care criteria refer to **Appendix 1.**

7.5. Healthcare professional responsible to conduct pregnancy risk assessment should have specific forms/tool to do so; such assessment should be documented in the patient's health records. For further details and information, please refer to **Appendix 2** and **Appendix 3.**

7.6. The following represent the four definitions of 'term' deliveries:

7.6.1. Early Term: Between 37 weeks 0 days and 38 weeks 6 days

7.6.2. Full Term: Between 39 weeks 0 days and 40 weeks 6 days

7.6.3. Late Term: Between 41 weeks 0 days and 41 weeks 6 days

7.6.4. Post term: Between 42 weeks 0 days and beyond

7.7. Low risk pregnancies can be managed in outpatient facility up to 36 weeks of gestation. Healthcare professionals providing low-risk obstetric care in outpatient facilities should be capable of managing unexpected obstetric emergencies and facilitate transporting to suitable hospital setup. The facility should have clear policies and procedures for timely transport of such cases.

7.8. Seek consultation with physicians and other healthcare professionals when necessary to provide optimal patient care for women with existing medical problems and previous complications.

7.9. In case of high-risk pregnancy, obstetrics and gynecologists should have early communication with the neonatologists in order to ensure provision of safe delivery.

7.10. Detailed anomaly scan should be conducted between 18-20 weeks of gestation, and screening for Group B-haemolytic streptococcus infection by low vaginal swab between 35-37 weeks of gestation. For further details and information, please refer to **Appendix 4.**

7.11. Obstetric service providers should organize family-education program (antenatal classes) with associated written and/or multimedia health instructional material including, but not limited to:

7.11.1. A delivery plan which should include the estimated date and place of delivery.

7.11.2. Normal obstetric care such nutrition, rest and other basic need.

7.11.3. Abnormal symptoms in mother for which the family should seek medical attention.

7.11.4. The importance of carrying antenatal record card for all antenatal visits.

7.11.5. Available options for pain relief during labour, with anaesthetic referral when needed e.g. epidural analgesia.

7.11.6. Early promotion and support of breastfeeding.

7.12. Genetic Screening may be performed on a pregnant woman in accordance with Article (12) from Federal Law by Decree No. (49) of 2023 Regulating the Use of the Human Genome.

<u>Level I - Basic care</u>

7.13. Health facilities providing Level I obstetric care shall maintain the capabilities of antenatal care in addition to the below:

7.13.1. Provide a basic level of care to uncomplicated pregnancies for pregnant women at thirty five (35) weeks of gestation and above.

7.13.2. Detect, stabilize, and initiate management of unanticipated maternal–foetal or neonatal problems that occur during the antenatal, intrapartum, or postnatal period until patient can be transferred to a facility which provides higher level of obstetric care.

7.13.3. Ability to perform emergency caesarean delivery within a time interval with clinical emphasis on maternal and foetal risks and benefits, and with the provision of emergency care.

7.13.4. Provide ultrasonography imaging services for maternal and foetal assessment with minimal of the following probes (convex, 4D convex, endo-cavity), and cardiotocography (CTG)

7.13.5. Provide clinical laboratory services for on 24/7 basis.

7.13.6. Provide blood bank supplies 24/7, including protocols and capabilities for blood and blood component therapy, in addition having Group O Negative red cells (at least 2 units) available on site for emergency use.

7.13.7. Establish formal transfer plans in partnership with a higher-level receiving health facility.

7.13.8. Initiate education and quality improvement programs to maximize patient safety, and/or collaborate with specialized providers to attain compliance.

7.13.9. Shall not provide intrapartum care for any pregnant woman at less than thirty five (35) gestational weeks except in emergency medical case where a pregnant woman having contractions with inadequate time to transfer safely to an appropriate higher level and the transfer will pose a threat to the health or safety of either pregnant woman or foetus.

7.13.10. The following equipment shall be available in each labour room:

a. A labour bed.

b. Vital signs monitor and stethoscope

c. CTG.

d. Access to portable ultrasonography.

e. Intravenous solutions and infusion pumps.

f. Equipment for inhalation and regional anaesthesia such as the following but not limited to:

- Boyle's apparatus
- Anesthesia kit
- Oxygen cylinder and mask
- Suction unit

g. Emergency/crash cart with proper supplies and medication such as:

- Defibrillators

- Suction devices
- Calcium chloride
- Sodium chloride
- Intubation kits
- Anesthesia
- For Emergency medication, refer to the DHA Policy for Emergency Medications, Appendix 1.

h. Instruments and equipment for normal delivery including but not limited to the following:

- Forceps (artery, dissecting, sponge)
- Umbilical Cord Scissors
- Suction apparatus
- Equipment for adult resuscitation
- Equipment for neonatal resuscitation
- Sphygmanometer, adult and newborn thermometer and newborn weighing machine.

i. Medications for the mother and infant (**Appendix 5**)

7.13.11. The hospital should have educational posters and clear pathways and protocols for major obstetric situations such as shoulder dystocia, Post-Partum Haemorrhage (PPH) and eclamptic seizure.

7.14. Health facilities providing Level I obstetric care shall maintain the below healthcare professionals to provide the intrapartum care on 24/7 basis:

7.14.1. Physicians:

a. DHA licensed Consultant/Specialist Obstetrician and Gynecologists

OR

b. DHA licensed GP who obtained a specialty degree and experience in Obstetrics and Gynecology but did not meet the required clinical experience as per the Professionals Qualification Requirements (PQR) to obtain a full specialist title. The GP shall be supervised by a consultant/specialist obstetrics and Gynecology and ratio should not exceed 2:1 (two GP to one consultant/specialist Obstetrics and Gynecology)

AND

c. DHA licensed Consultant/Specialist Pediatrician or Neonatologist

d. DHA licensed Consultant/Specialist Anaesthetist to provide labour analgesia and surgical anaesthesia (when required).

7.14.2. Nurses: DHA licensed RM/RN with experience in obstetric care and holding an active Basic Life Support (BLS) and Neonatal Resuscitation Program (NRP), the following nurse/patient ratios are required:

a. Antenatal/postnatal ward at a ratio of 1:4

b. Induction of labour at a ratio of 1:2.

c. Patients in first stage of labour at a ratio of 1:2.

d. Patients in second stage of labour at a ratio of 1:1.

7.14.3. In-charge nurse: It is recommended to assign an In-charge nurse to supervise the obstetric care who should be trained, qualified, and competent to stabilize and transfer high-risk women and new-borns.

7.14.4. At the time of twins' delivery, two Pediatricians or Neonatologists and two NRP, trained nurses shall be available immediately.

7.14.5. Other healthcare professionals such as Physiotherapist (optional).

7.14.6. DHA licensed Clinical Dietitian with knowledge of maternal and new-born nutrition and parenteral/enteral nutrition management of at-risk new-borns.

7.14.7. To ensure competencies of the healthcare professionals providing Level I obstetric services, at least 100 deliveries should be conducted every year.

7.14.8. Health facilities providing Level I obstetric care shall provide a Level I. neonatal care services to new-born infants.

Level II - Specialty Care

7.15. Level II obstetric care can provide care to high-risk pregnancies and for pregnant women at thirty two (32) gestational weeks and above, unless an emergency medical condition exists.

7.16. Health facilities providing Level II obstetric care shall maintain the capabilities of Level I in addition to the below:

7.16.1. Capability to perform Computed Tomography (CT) scan and Magnetic Resonance Imaging (MRI).

7.16.2. Special equipment and care might be needed to accommodate the services needed for obese women and healthcare professionals should be trained to handle bariatric cases. Suggested equipment for bariatric women includes:

a. Bariatric operating table

b. Bariatric profiling bed

c. Transfer chair

d. Bariatric folding wheelchair

7.17. Health facilities providing Level II obstetric care shall maintain the below healthcare professionals:

7.17.1. Physicians:

a. DHA licensed Consultant/Specialist Obstetrician and Gynecologists, Consultant/Specialist Pediatrician or Neonatologist and Anaesthesiologist shall be available on 24/7 basis.

b. Prompt and readily available DHA licensed Medical and Surgical Specialties and Maternal and foetal Medicine Subspecialists either by onsite consultation or by telemedicine, if needed.

7.17.2. Nurses: Staffing of nurses shall be similar to Level I in addition to:

a. Maintaining at least two (2) RN or RM for labour and delivery.

b. Postpartum ward, high dependency unit (HDU) at a ratio of 1:1.

7.17.3. DHA licensed Physiotherapist.

7.17.4. Psychologist/Social Worker (optional) to provide psychosocial assessments and family support services.

7.17.5. Health facilities providing Level II obstetric care shall maintain level II neonatal care units.

Level III - Subspecialty Care

7.18. Level III obstetric care can provide care to more complex obstetric and foetal cases as well as pregnant women at less than thirty two (32) gestational weeks.

7.19. Health facilities providing Level III obstetric care shall maintain the same capabilities of Level II in addition to the below:

7.19.1. Provide advanced ultrasonography imaging services for maternal and foetal assessment with minimal of the following probes (convex, 4D convex, endo-cavity, linear, small part linear), including Doppler studies on 24/7 basis.

7.19.2. Have medical and surgical Intensive Care Units (ICUs).

7.19.3. Provide ventilation and ability to stabilize the patient in labour and delivery until transferred safely to ICU when needed.

7.20. Health facilities providing Level III obstetric care shall maintain the below healthcare professionals in addition to those mentioned in level II:

7.20.1. Physicians:

a. Consultant in Critical Care Medicine.

b. Prompt and readily available full range of DHA licensed Medical – Surgical subspecialists based upon the medical needs of the patient in critical care, general surgery, neurosurgery, cardiac surgery, infectious disease, haematology, cardiology, nephrology, neurology, and neonatology.

7.20.2. Nurses: staffing of nurses shall be similar to Level II in addition to:

a. Appropriately trained and qualified RN/RM with special experience in the management of pregnant women with complex obstetric related illnesses and complications.

b. Antenatal/postnatal patients at a ratio of 1:1.

7.20.3. Health facilities providing Level III obstetric care shall maintain level III neonatal care units.

7.21. Water birth requirements:

7.21.1. The Delivery room will require direct access to a water pool area; this may be integrated within the delivery room. Make sure to have an easy flow access and circulation around the pool.

a. Birth pools can be either permanently installed or portable as per the manufacturer's specifications.

b. Surface should be non-slip, anti-bacterial, nonporous, moisture resistance, smooth, has no crevice or seams, and easy to clean.

c. Provision of grab rails for patients.

d. Easily accessible medical gases including nitrous oxide and oxygen used for pain relief to the pool area.

e. The pool should be regularly maintained.

f. Routine testing of the hospital water supply should be applied.

g. Consideration should be given to ensure that the pool temperature is controlled at the time of the birth.

h. The facility is equipped with a proper mechanical air-ventilation system: the space shall provide supply and return duct diffusers (The temperature shall be controlled).

7.21.2. All staffs should be trained and ensure that their knowledge and skills are up-to-date.

8. **STANDARD FOUR:** NEONATAL SERVICE REQUIREMENTS

8.1. Neonatal identification

8.1.1. All health facilities shall use two / three identifiers for babies, not including the use of the patient's room number or location.

8.1.2. The identification bands shall be:

a. Accurate and in consistent placement to reduce errors associated with patient identification.

b. Small enough to be comfortable and secure for new-borns babies.

8.1.3. The following patient identifier should be recorded on the identification card:

a. Name: should be identified by the mother name (e.g. baby of Sara)

b. In case of twins or multiple babies, an identifier should be, e.g. Twin 1 of Sara, Twin 2 of Sara, etc.

c. File number for mother and baby.

d. Gender.

e. Date and Time of birth.

f. Birth weight.

g. Head circumference.

h. Length.

i. Gestation.

8.2. The staff and patient's family/carer shall be educated regarding the security procedures and visiting policies.

8.3. To minimize the risk of infant abduction all areas including new-born nurseries, intrapartum and postnatal should be controlled and part of hospital safety program.

8.4. Physician coverage in Neonatal Unit available in the hospital on 24/7 basis.

8.5. For summary of Neonatal Levels of Care criteria refer to **Appendix 6**.

Level I - Basic care

8.6. Evaluate and provide routine postnatal care for full term new-born infants.

8.7. Stabilize and provide care for physiologically stable early/late term.

8.8. Provide a basic level of care to neonates who are at low risk.

8.9. Stabilize new-born infants who are ill, and those born less than 35 gestational age until they transferred to a higher level of neonatal care.

8.10. Perform neonatal resuscitation whenever needed.

8.11. Provide clinical laboratory services, x-ray and ultrasonography on 24/7 basis.

8.12. All healthcare professionals (medical and nursing) working at the neonatology department shall be trained and certified by Neonatal Resuscitation Program (NRP).

8.13. The units in level I Neonatal care shall maintain the below healthcare professionals:

8.13.1. NICU in charge physician can be one of the following:

a. DHA licensed Consultant/Specialist Neonatologist.

OR

b. DHA licensed Consultant/Specialist Pediatrician shall pass DHA assessment to add the neonatology scope within his/her privilege.

8.13.2. The health facility shall have a licensed specialist paediatrician with last 2 years' experience in neonatology.

a. Licensed GP with a recognized specialty degree in pediatrics with 2 years' experience can provide the service (the healthcare professional shall apply to add this title in their professional license through the upgrade process on sheryan).

8.13.3. Nurses:

a. DHA licensed registered nurse (RN) with not less than 2 years of recent experience in neonatology care in appropriate hospital setting.

OR

b. A DHA licensed neonatal nurse.

c. At this level, one nurse should be responsible for the care of a maximum of four babies (ratio 1:4) receiving special or normal care.

Level II - Specialty care

8.14. Level II neonatal care services shall have the same capabilities of level I in addition to the below capabilities:

8.14.1. Provide care for stable or moderately ill new-born infants who are:

a. Born at more than 32 weeks of gestational age.

b. Weighs more than or equal to 1500 g at birth with problems that are expected to resolve rapidly.

c. Not expected to need subspecialty-level services on an urgent basis.

Note: These situations usually occur as a result of relatively uncomplicated preterm labour or preterm rupture of membranes.

8.14.2. Provide assisted/mechanical ventilation on an interim basis (less than 24 hours) or continuous positive airway pressure until the infant's condition either soon improves or the infant can be transferred to a facility with a higher neonatal level.

8.14.3. Provide oxygen via nasal cannula or oxygen blender specifically designed for NICU.

8.14.4. Provide care for infants convalescing after intensive care.

8.14.5. Stabilize infants born before 32 gestational age and weighting less than 1500g until transfer to a higher level neonatal intensive care unit.

8.14.6. Refer all infants when needed for pediatric surgical or medical subspecialty intervention to a higher level of neonatal care.

a. Hospitals providing level II services shall maintain the below healthcare professionals:

8.14.7. NICU in charge physician

a. DHA licensed Consultant/Specialist Neonatologist .

b. Ensure that a neonatal consultant/specialist is present at all times of the functioning unit.

c. The team should include a physician with experience in neonatal care present 24/7 in the NICU.

8.14.8. Nurses:

a. In this level, one nurse should not be responsible for the care of more than two babies (ratio 1:2).

8.14.9. Other healthcare professionals (optional):

a. Respiratory Therapists

b. DHA licensed Clinical Dietitian with knowledge of new-born nutrition.

8.15. Hospitals providing level II neonatal care shall maintain the below requirements, in addition to level I:

8.15.1. Access to radiology services (CT and MRI) on 24/7 basis.

8.15.2. The following range of equipment:

a. Neonatal intensive care incubators

b. Neonatal ventilator

c. Syringe/infusion pumps (0.1 ml/hour)

d. Neonatal resuscitator along with emergency/crash cart including proper supplies and medication.

e. Blood gas analyser

f. Phototherapy units

g. Portable x-rays

h. Portable ultrasound scanning

i. Breast pump machine

j. Oxygen analyser/pulse oximeter

k. Umbilical arterial and venous catheter

l. Neonatal monitors to measure heart rate, respiratory rate, blood pressure, transcutaneous CO_2 monitor, oxygen saturation and ambient oxygen

m. Medications for infant

n. Portable incubator with ventilator.

Note: If a pediatric service and a neonatal level II service co-exist in a hospital, staffing arrangements shall ensure the immediate availability to the neonatal unit of a professional competent to manage a neonatal emergency when the pediatric service is busy.

8.15.3. Ensure the availability of or access to land, fixed-wing transport services for a quick and safe transfer infants requiring subspecialty intervention. Potential transfer to higher-level facilities as well as back-transport of recovering infants to lower-level facilities should be considered as clinically indicated.

Level III - Subspecialty intensive care (NICUs)

8.16. Level III neonatal care services shall have the same capabilities of level II in addition to the below capabilities:

8.16.1. Provide care for the infants who are born at less than 32 gestational age, weigh less than 1500g at birth, or have medical or surgical conditions, regardless of gestational age.

8.16.2. Provide a full range of respiratory support (ongoing assisted ventilation for 24 hours or more) that may include conventional and/or high frequency ventilation and inhaled nitric oxide.

8.16.3. Provide a full range of physiologic monitoring equipment, laboratory and imaging facilities, nutrition and pharmacy support with pediatric expertise.

8.16.4. Provide hypothermia system (total body cooling) and capability to perform cerebral function monitoring.

8.16.5. Perform advanced imaging, with interpretation on an urgent basis, including:

a. Computed tomography

b. MRI

c. ECG

d. Echocardiogram

8.16.6. Have a Pediatric cardiologist on-call to perform Function ECHO.

8.16.7. Have the capability to perform major surgery onsite or at a closely related hospital, ideally in close geographic proximity.

8.16.8. Have the capability of performing Neonatal retrieval from Level I and II NICU for critical Neonates who require Level III care.

8.16.9. Hospitals providing level III services shall maintain the below healthcare professionals:

a. Physicians

i. Minimum of two (2) tertiary neonatal consultants to cover the unit when one is away.

ii. Must have a DHA licensed Consultant Neonatologist (NICU in charge and head of the unit|)

iii. DHA licensed Specialist Neonatologist with last 5 years' experience in neonatology.

iv. One physician available in the Neonatal Unit on 24/7 basis:

- DHA licensed Specialist Pediatrician with last 2 years' experience in neonatology, **OR**
- Licensed GP with degree in pediatric and last 3 years' experience in neonatology.

v. Prompt and readily available full range of DHA licensed Pediatric Medical Subspecialists, Pediatric Surgical Specialists, Anaesthesiologists, and Ophthalmologists with experience in neonates by either onsite access or by prearranged consultative agreements.

b. Nurses:

i. Appropriately trained in neonatal services and qualified nurses who should have responsibility for the care of one baby (ratio 1:1).

8.16.10. All level 3 units in Dubai must be part of the Dubai neonatal network to be monitored for major outcomes such as:

a. Death

b. ROP

c. Bilirubin encephalopathy

d. Grade ¾ IVH

e. Chronic lung disease

8.17. All health facilities shall develop and implement a policy for nutritional management aimed to optimize nutrition and prevent malnutrition detailing the following, but not limited:

8.17.1. The importance of the breastfeeding.

8.17.2. Newborn babies who can start breast milk or formula milk by mouth or through nasogastric (NG)/ orogastric (OG) tube.

8.17.3. Newborn babies who are very small, sick or cannot coordinate sucking, breathing, and swallowing.

8.17.4. The outsourcing of the parenteral nutrition preparation and its administration.

8.17.5. The preparation (including the required equipment and preparation area), safe storage and handling of the new-born formula.

8.18. Premature babies who stay in the NICU shall be monitored closely to make sure that they are getting the right balance of fluids and nutrition.

8.19. All health facilities shall provide lactation support training programs for all obstetric and neonatal units' staff related to new-born babies feeding and nutritional needs :

8.19.1. The nutritional and physiological aspects of breastfeeding.

8.19.2. Positioning of mother and infant to promote effective sucking, milk release and production.

8.19.3. Practices to avoid, recognize and treat common breastfeeding complications.

8.19.4. Nutritional needs of the mother and infant during lactation.

8.19.5. Safe techniques for breastmilk storage.

8.19.6. Cultural values related to breastfeeding.

8.19.7. Information about community support services available to the family after discharge.

8.20. All health facilities should offer educational programs for all women during antenatal or postnatal care related to new-born babies feeding and nutritional needs.

8.21. Health facilities should encourage healthcare professional to participate in lactation and breastfeeding care courses, such as International Board Certified Lactation Consultant (IBCLC) to develop and utilize extensive breastfeeding management skills.

9. **STANDARD FIVE:** NEONATAL ASSESSMENT AND SCREENING

9.1. Newborn babies shall be admitted to the neonatal care units based on their assessment.

9.2. Newborn babies with unknown gestation shall be initially examined and fully assessed for normal and dysmorphic features, using Apgar score and Ballard score, please refer to **Appendix 7 , Appendix 8** and **Appendix 9**.

9.3. Matters such as new-born care, feeding; Vitamin K, Hepatitis B and Bacilli Chalmette-Guerin (BCG) vaccines and Retinopathy of Prematurity (ROP) screening should be discussed with physician according to new-born condition.

9.4. Neonatal screening tests shall be performed for the baby as per Cabinet Decision no. (15) of 2020 concerning newborn screening, this include but not limited to:

9.4.1. Laboratory neonatal screening test (heel prick test/ Guthrie test)

9.4.2. Neonatal Hearing Screening

9.4.3. Critical Congenital Heart Disease (CCHD) screen.

9.4.4. For further details, please refer to **Appendix 10**

9.5. Newborn metabolic screening, CCHD and Hearing screening must be performed for all neonates before discharge.

9.6. Neonatal circumcision should be offered and arranged.

9.7. New-born Screening Services shall be performed only in a general hospital settings or specialized surgical hospitals with a fully equipped intensive care unit (ICU).

9.8. Timing of Blood Collection

9.8.1. A New Born Screening (NBS) sample should be collected between one day (24 hours) to two days (48 hours) after the birth of the infant.

9.8.2. The ideal time to obtain the sample is between one day (24 hours) and two (2) days (48 hours) after birth.

9.8.3. The timing of sample collection under different circumstances is elaborated in **Appendix 11.**

9.8.4. Procedure for Blood spot specimen collection is elaborated in **Appendix 10.**

9.8.5. The equipment required for Blood spot specimen collection is elaborated in **Appendix 12.**

9.8.6. Specimen handling and integrity.

a. Following the application to the blood spot collection card, avoid touching or smearing the blood spots. Allow the blood specimen to air dry for at least three hours in a horizontal position.

b. Avoid exposing the specimen to direct sunlight, heat, alcohol, intense fluorescent lights, fumes from preservatives such as formaldehyde, or fumes from various disinfectants as they can interfere with the analysis or render the specimen unacceptable.

c. Send the dry specimen to the screening laboratory as soon as possible after the blood spots have dried. Samples should be sent within twenty four (24) hours of collection. Delays could have serious consequences for affected infants and may render the sample unsatisfactory

d. Specimens are stable for approximately two (2) days at normal room conditions, e.g., ~70 °F and normal humidity, however, if the specimen cannot be sent as soon as it is dry; the filter paper should be placed in a sealable plastic bag and stored in a refrigerator (≤ 8 °C) or preferably in a freezer. Ensure that the paper remains dry by keeping it in a plastic bag.

e. Samples received at National Reference Lab (NRL) up to fourteen (14) days after collection will be analysed. If results are positive for any disease, this will be reported as screen positive. However, the quality of results cannot be assured due to possible degradation and a repeat sample will be required.

f. For packaging and shipping Use the basic triple-packaging system to ship the filter paper cards:

   i. The primary container is the filter paper matrix that contains the absorbed and dried blood

   ii. A secondary container must enclose the filter paper. The secondary container should have a fold-over flap or an inner envelope to secure the contents

iii. Place the secondary envelope in a bigger sturdy envelope. This will provide safety from occupational exposure and maintain optimal specimen integrity.

9.9. Neonatal screening specimens may be deemed unsatisfactory for the following reasons:

9.9.1. Unsatisfactory Specimens due to Missing Data

a. The newborn screening requisition portion of the newborn screening card must be completed to ensure proper specimen labelling for positive identification of the patient. See section 1.2 for required information.

9.9.2. Unsatisfactory Specimens due to Sample Collection Timing

a. Collected at < 24 hours of age – Thyroid testing is not reliable

b. Collected at > 90 days of age - Cystic Fibrosis (IRT) testing is not reliable

c. Specimen received > 14 days after collection (delayed shipping), many analytes may not be reliable.

9.9.3. Unsatisfactory Specimens due to Sample Quantity/Quality. For description and possible causes refer to **Appendix 13**.

10. STANDARD SIX: NEONATAL SCREENING REPORTING AND QUALITY ASSURANCE

10.1. As per Cabinet Resolution No. (15) of 2020 on Newborn Medical Examination System, health facilities providing neonatal screening services shall:

10.1.1. All blood sampling taken from newborns shall be sent to the reference laboratory to conduct the tests included in the Newborn Examination System,

such health facilities must provide the necessary capabilities to conduct the hearing and heart examinations.

10.2. Obligatory genomic screening of newborns shall be conducted as per article (14) of the Federal Law by Decree No. (49) of 2023 Regulating the Use of the Human Genome.

10.3. Disorders screened by the National Neonatal Screening Program in the UAE are as follows:

10.3.1. Amino Acids

a. Phenylketonuria (PKU)

b. Maple Syrup Urine Disease (MSUD)

c. Citrullinemia Type I

d. Tyrosinemia Type I

e. Homocystinuria

f. Organic Acidurias

g. Glutaric academia type I

h. Multiple carboxylase

i. Methylmalonic Acidaemia (mutase deficiency and cobalamin A & B)

j. Propionic acidaemia

k. 3-Hydroxy-3-methylglutaryl-CoA lyase (HMG CoA) Lyase deficiency

l. Beta Ketothiolase deficiency

m. 3-Methylcrotonyl-CoA carboxylase 1 (MCC-1) deficiency

n. Isovaleric Acidaemia

o. Hydroxy methyl glutaric aciduria (Hydroxymethylglutaryl lyase deficiency)(HMG)

p. Methylmalonic acidemia, cblA and cblB forms (MMA, Cbl A,B)

q. Beta-ketothiolase deficiency (BKT)

10.3.2. Fatty Acid Oxidation Disorders

a. Medium-chain acyl-CoA dehydrogenase (MCAD) Deficiency

b. Very-Long-Chain Acyl-CoA dehydrogenase (VLCAD) Deficiency

c. Long-Chain Acyl-CoA dehydrogenase (LCHAD) Deficiency

d. Trifunctional Protein Deficiency (TFP)

e. Carnitine uptake defect (CUD)

10.3.3. Other Disorders

a. Hemoglobinopathies (HbS, HbC, Beta Thalassemia)

b. Galactosemia (GALT)

c. Biotinidanse deficiency

d. Congenital Hypothyroidism (CH)

e. Congenital Adrenal Hyperplasia (CAH)

f. Cystic Fibrosis

g. Sickle cell anemia (Hb SS)

h. Sickle cell disease (Hb S/C)

i. Hb S/Beta-Thalassemia (Hb S/Th)

j. B-Thalassemia major

k. Variant hemoglobinopathies (including Hb E)

l. Tyrosinemia I,II,III (TYR I, II, III)

m. Argininoscuccinic aciduria (ASA)

n. Benign hyperphenylalaninemia

o. Defects of biopterin cofactor biosynthesis

p. Defects of biopterin cofactor regeneration

q. Hypermethioninemia

r. Argininemia

s. Holocarboxylase synthase deficiency

t. Isobutyryl-CoA dehydrogenase deficiency (IBDH)

u. Glutaric acidemia type II (Multiple Acyl-CoA Dehydrogenase Deficiency) (MAD; GA-II)

v. Carnitine palmityl transferase deficiency type 1

w. Carnitine palmityl transferase deficiency type 2

x. Short-chain acyl-CoA dehydrogenase deficiency (SCAD)

y. Carnitine/acylcarnitine Translocase Deficiency (Translocase)

z. G6PD test

Reporting and Data Analysis

10.4. Results should be reported back within 48 to 72 hours up to 72 hours to the ordering facility in more than or equal to 90% of the cases tested

10.5. Data will be submitted by the testing laboratory to the health facility as well as periodically to DHA

10.6. Periodic data analysis for quality KPIs such as turnaround time and rejection rates shall be carried out

10.7. Performance of confirmatory tests by the NBS laboratory for the positive cases

10.8. Periodic review with regional treatment centres is advised to monitor false positive and false negative rates.

Follow Up

10.9. Positive or equivocal screening

10.9.1. The rapid follow-up of an infant with a positive or equivocal screening test is of the highest priority. Positive results from newborn screening should have a confirmatory test performed as quickly as possible. The pediatrician or primary care provider (PCP) is responsible for ensuring that newborn screening has been completed and that all positive screening results are followed until a diagnosis is confirmed or excluded.

10.9.2. The primary care provider should also provide education and support to families/caregivers with infants with a false-positive result as parents/caregivers may continue to have some anxiety, and the impact can be decreased with careful explanation of the process. The risk of a false-positive result is higher in preterm infants with gestational age <32 weeks screened for hypothyroidism and adrenal hyperplasia before 48 hours of life.

Negative screening

10.10. The primary care provider also must remain vigilant to the development of disease, as a negative result does not rule out a disorder even if screening is performed appropriately (false-negative test). False-negative results are more likely in infants born prematurely, in those who received blood transfusions or dialysis therapy, or in those who were tested too early (less than 24 hours of age).

10.11. Quality Assurance Recommendations for the Health Care Facility- In order to ensure a high-quality standard of NBS testing is performed by the healthcare facility, it is recommended to implement the following processes and procedures.

10.11.1. Ensuring specimen collection prior to discharge was actually done

10.11.2. Informing parent or guardian for need of repeat testing if the initial specimen was collected prior to 24 hours or after a blood transfusion

10.11.3. Testing under special circumstances (preterm infant, transfer, etc.)

10.11.4. Documentation should a parent or guardian refuse testing.

10.11.5. Designate individuals responsible for:

a. Filling in the new-born screening card

b. Specimen collection

c. Recording the collection in the infant's chart

d. Sending the specimen to laboratory

e. Ensuring test results are received and entered into the infant's chart

f. Receiving positive screen results from the NBS screening laboratory and coordinating referrals to a pediatric specialist.

Responsibilities by role:

10.12. **Prenatal healthcare clinicians (e.g. obstetricians):** Educate expectant parents on the importance of newborn screening and identifying the medical home for their new-born infant.

10.13. **Birthing facilities:** Responsible for obtaining, processing, and delivering a high-quality specimen to the designated screening laboratory. Identification of the medical home should be established as a condition for discharge. Discharge documents should clearly indicate whether or not screening was performed. They should identify the name of the clinician responsible for the birth hospitalization and the name of the PCP providing clinical care after discharge, who are contacts for any abnormal result.

10.14. **Pediatric medical subspecialists:** Provide coordinated care with the primary care clinician when a child is diagnosed with a specific disorder. Genetic counselling, testing of other family members, and family/caregiver support services should be facilitated. Subspecialists should also provide guidance to the states in the development of screening programs, including educational material. Children with PKU, congenital hypothyroidism, congenital adrenal hyperplasia, and other conditions identified by newborn screening programs may have behavioural changes resulting from these disorders, although intellectual disability, learning difficulties, and some behaviour

problems are reduced by early intervention. Thus, long-term follow-up, including neuropsychological testing, should be provided.

10.15. Quality Assurance Requirements for the NBS Laboratory. The laboratory conducting NBS testing should fulfil the below requirements:

10.15.1. Shall be a DHA licensed Clinical Laboratory.

10.15.2. Shall be accredited by ISO 15189 or College of American Pathologists for the NBS testing.

10.15.3. Shall participate in External Proficiency Testing Program.

10.15.4. Testing shall be performed under medical direction of licensed pathologist or biomedical genetics professional with relevant experience in NBS testing.

10.15.5. Shall perform all NBS testing listed in these guidelines in the UAE.

11. STANDARD SEVEN: STILL BIRTH AND NEONATAL DEATH

11.1. In case of Stillbirth or Neonatal Death there should be two identifiers to identify the deceased.

11.2. Parents may be referred for psychological support and chromosomal studies performed at the request and consent of parents.

11.3. The deceased's care and management shall be as per UAE applicable Federal Laws and local regulations. The health facility should develop a policy and procedures to comply with the laws.

11.4. All deaths from health facilities (Inpatient Death, Death on Arrival (DOA) & Stillbirths) shall be reported to Clinical Governance Office (CGO), HRD by filling up the Death

Notification Form (DNF) online which maybe be accessed via http: //eservices.dha.gov.ae/BDN/admin CG/ca main.aspx

11.5. Refer to the DHA Standards for Mortuary Services and the DHA Guidelines for the Management of Mortality and Morbidity in Health Facilities (available on the DHA website).

12. STANDARD EIGHT: TRANSFER, DISCHARGE AND FOLLOW-UP

12.1. Transfer of patients with emergency conditions shall be conducted in accordance with written hospital policy and shall adhere to the DHA's requirements.

12.2. The policy should include:

12.2.1. Transfer criteria

12.2.2. Healthcare professionals who should be involved in the communication,

12.2.3. Appropriate responses where face-to-face briefings are not possible

12.2.4. Minimum equipment required to transfer, but not limited to the following:

a. Portable suction

b. Portable ECG

c. Oxygen and breathing equipment (Defibrillators, Ventilators... etc.)

12.2.5. Full medical report and care information, diagnoses and current condition of the mother and baby, recent/anticipated changes in condition or treatment

12.2.6. Suggestions on what to watch for in the next interval of care

12.3. The hospital shall obtain patient consent or approval of carer to confirm transfer to higher Level service provider when required.

12.4. The transfer should be planned with the other hospital to ensure continuity of care with proper handover.

12.4.1. The facility shall adhere to the DHA policy for Patient Referral and Inter-facility Transfer.

12.5. Discharge planning for neonatal care may include:

12.5.1. Neurodevelopmental follow-up for extreme premature and at risk patients

12.5.2. Infant follow-up clinic appointment

12.5.3. Hearing screening test prior to discharge

12.5.4. Lactation clinic appointment

12.5.5. Respiratory syncytial Virus (RSV) Vaccination for preterm babies

12.5.6. Car seat safety measures

12.6. Decision to discharge shall be taken by treating physician for the mother and the Pediatrician /Neonatologist for the baby.

12.7. Neonatal discharge shall be based on a predefined criterion as per the health facility policies and should include, but not limited to:

12.7.1. Baby's ability to feed and suck appropriately.

12.7.2. Maintenance of vital signs such as temperature, blood pressure, pulse, respiratory rate, arterial oxygen saturation using pulse oximetry.

12.7.3. Urine and stool passage.

12.7.4. Baby's weight.

12.8. Planning for discharge shall include appointments for follow-up care and referral to appropriate healthcare professionals for both mother and baby including:

12.8.1. Follow-up for neonatal assessments including ROP and neurodevelopment assessment for premature babies

12.8.2. Follow-up for the mother with the Family Medicine /Obstetrics and Gynecology physician.

12.8.3. Referral for babies with identified problems to the concerned specialists.

12.9. All health facilities shall ensure that babies received the BCG and Hepatitis B vaccines at the time of discharge based on the immunization guidelines, and HBV antibody to babies of HBS AG positive mothers

12.10. Mothers who are rubella antibody negative shall receive rubella vaccine prior to discharge.

12.11. Parents/carers shall be educated for the signs and symptoms that require seeking immediate medical care.

12.12. Mothers with existing medical problems and previous complications that might be aggravated by future pregnancies shall be counselled by the obstetric and gynecologist for future conception.

12.13. Infant follow up clinic appointment for preterm babies.

12.14. A written discharge summary should be given to patients upon discharge including all details of treatment, Immunizations and growth pattern.

13. STANDARD NINE: INFECTION CONTROL

13.1. Health facilities providing obstetric and neonatal care shall develop and implement a policy to ensure safe and appropriate practice and management of sample collection, blood and blood products in line with the local regulations and related federal laws.

13.1.1. Health facilities providing intrapartum care shall have group O negative red cells available on site for emergency use (at least 2 units), informed consent for the transfusion shall be obtained prior to administering any blood components / products, for further details, refer to the United Arab Emirates (UAE) Cabinet Resolution No. 28 concerning Blood Transfusion Regulation.

13.1.2. Health facilities shall provide the appropriate equipment and supplies necessary for blood management.

13.2. All healthcare professionals involved in providing obstetric and neonatal services shall understand and abide by the infection control policies and safety precautions to eliminate the risks of infection to the mother and baby.

13.3. Isolation room requirements in NICU department include:

13.3.1. An airborne infection isolation room shall be available for NICU infants, and shall provide a minimum of 180 square feet (16.7 square meters) of clear floor space, excluding the entry work area.

13.3.2. To reduce infection, spacing of incubators and cots should be prescribed in accordance with international standards of cot space sizes.

13.3.3. A hands-free handwashing station for hand hygiene and areas for gowning and storage of clean and soiled materials shall be provided near the entrance to the room.

13.3.4. Ventilation systems for isolation rooms shall be engineered to have negative air pressure with air 100% exhausted to the outside, and shall meet acoustic standards for infant rooms.

13.4. The nursing team of NICU and infection control committee shall work together to detect and prevent infections such as Pseudomonas aeruginosa in order to improve the quality of life of the new-born.

13.5. Infection risk should be assessed based on symptoms of infection, in order to determine which interventions or avoidance procedures are required to minimize risk and prevent transmission of infection during the interaction.

13.6. The policy shall emphasis on (but not limited to) the following:

13.6.1. Hand hygiene.

13.6.2. Appropriate use of Personal Protective Equipment (PPE)

13.6.3. Proper performance of environmental cleaning and disinfection on a routine and consistent basis to provide for a safe and sanitary environment

13.6.4. Equipment Reprocessing

13.6.5. Family, staff and visitors with emphasis on restricting visits if they are unwell with signs and symptoms that are possibly infectious in aetiology.

13.6.6. Readmission from community or transfer from another hospital.

13.6.7. Transfer In – mothers/babies who are transferred in from other hospitals should be screened for Methicillin resistant staph aureus (MRSA).

13.6.8. Transfer Out – mothers receiving facilities should be notified about any known infection, colonization or exposure.

13.6.9. Transfer In –newborn's that are transferred in should be screened for the presence of Methicillin-resistant Staphylococcus aureus (MRSA), respiratory viruses using the respiratory multiplex and other Multi-resistant organisms (MROs), if suspected, consider putting the new-born on additional precautions until results are known, dependent on the assessed level of risk (e.g., outbreak in the transferring unit, maternal colonization risk).

13.6.10. All health facilities shall provide regular and basic trainings for all healthcare professionals in infection prevention and control.

13.6.11. Ventilator-associated pneumonia and Central Line-associated Bloodstream Infection (CLABSI) prevention activities shall be carried out to improve quality of care and safety in Neonatal Intensive Care Unit Patients.

REFERENCES

1. Alex R Kemper, MD, MPH, MS. Newborn Screening. UpToDate. Available at: https://www.uptodate.com/contents/newborn-screening [Accessed 15 August 2023]
2. American College of Obstetricians and Gynecologists (ACOG). Obstetric Care Consensus2019) Available at: https://www.ajog.org/article/S0002-9378(19)30753-7/fulltext [Accessed 14 August 2023]
3. American Congress of Obstetricians and Gynecologists (2013). Ob-Gyns Redefine Meaning of "Term Pregnancy". Available at https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2013/11/definition-of-term-pregnancy#:~:text=The%20work%20group%20recommended%20that,weeks%20of%20gestation%20Box%201. [Accessed 15 August 2023]
4. American Academy of Pediatrics (2012). Levels of Neonatal Care. Available at: https://publications.aap.org/pediatrics/article/130/3/587/30212/Levels-of-Neonatal-Care [Accessed 14 August 2023]
5. American Academy of Pediatrics Newborn Screening Authoring Committee. Newborn screening expands: recommendations for pediatricians and medical homes--implications for the system. Pediatrics 2008; 121:192. https://publications.aap.org/pediatrics/article/121/1/192/71026/Newborn-Screening-Expands-Recommendations-for [Accessed 16 August 2023]
6. Bartlett K, Eaton SJ, Pourfarzam M. New developments in neonatal screening. Arch Dis Child Fetal Neonatal Ed 1997; 77:F151.

7. British Association of perinatal medicine (2010). Service Standards for Hospitals Providing Neonatal Care 3rd Edition. Available at: https://www.nna.org.uk/assets/bapm_standards_final_aug2010.pdf [Accessed 15 August 2023]
8. Cabinet Decision no. (28) of 2008 concerning Blood Transfusion Regulation
9. Centers for Disease Control and Prevention (CDC). Good laboratory practices for biochemical genetic testing and newborn screening for inherited metabolic disorders. MMWR Recomm Rep 2012; 61:1.
10. Clinical and Laboratory Standards Institute. NBS01. Dried Blood Spot Specimen Collection for Newborn Screening. 7th Edition.
11. Dubai Health Authority (DHA) Guidelines for Health Facility Design
12. Evans MI, Krivchenia EL. Principles of screening. Clin Perinatol 2001; 28:273.
13. Khoury MJ, McCabe LL, McCabe ER. Population screening in the age of genomic medicine. N Engl J Med 2003; 348:50.
14. Newborn Screening Quality Assurance Program (NSQAP) | CDC. Available at: https://www.cdc.gov/labstandards/nsqap.html [Accessed 16 August 2023]
15. Naylor EW, Chace DH. Automated tandem mass spectrometry for mass newborn screening for disorders in fatty acid, organic acid, and amino acid metabolism. J Child Neurol 1999; 14 Suppl 1:S4.

16. Recommended Uniform Screening Panel | HRSA. Available at: https://www.hrsa.gov/advisory-committees/heritable-disorders/rusp [Accessed 16 August 2023]

17. United Arab Emirates Cabinet Decree number 15 for 2020 concerning Newborn Screening

18. University of Notre Dame. (n.d.). *NICU Standard 8: Airborne Infection Isolation Room(s)*. NICU Recommended Standards. https://nicudesign.nd.edu/nicu-standards/nicu-standard-9-airborne-infection-isolation-room-s/#:~:text=An%20airborne%20infection%20isolation%20room,excluding%20the%20entry%20work%20area.

19. Zinn AB. Inborn errors of metabolism. In: Neonatal-Perinatal Medicine: Diseases of the Fetus and Infant, 9th ed, Martin RJ, Fanaroff AA, Walsh MC (Eds), Elsevier Mosby, St. Louis 2011. Vol 2, p.1621. Available at: https://www.mea.elsevierhealth.com/fanaroff-and-martins-neonatal-perinatal-medicine-2-volume-set-9780323567114.html [Accessed 16 August 2023]

APPENDICES

APPENDIX 1: LEVELS OF MATERNAL CARE, CAPABILITIES AND HEALTHCARE PROFESSIONALS

Level of care	Capabilities	Healthcare professionals
Level I - Basic care	• Provide a basic level of care to uncomplicated pregnancies for pregnant women at thirty five (35) weeks of gestation and above. • Detect, stabilize, and initiate management of unanticipated maternal–foetal or neonatal problems that occur during the antenatal, intrapartum, or postnatal period until patient can be transferred to a facility which providing higher level of obstetric care. • Ability to perform emergency caesarean delivery within a time interval with clinical emphasis on maternal and foetal risks and benefits, and with the provision of emergency care. • Support services shall be readily available at all times, including laboratory testing and blood bank.	• Consultant/Specialist Obstetrician and Gynecologists **OR** • GP who obtained a specialty degree and experience in Obstetrics and Gynecology **OR** • Consultant/Specialist Family Medicine • Consultant/Specialist Anaesthetist. • Registered midwife (RM) or assistant midwife (AM) or registered nurse (RN) or assistant nurse (AN) with experience in obstetric care and holding an active Neonatal Resuscitation Program (NRP). • Physician with privileges to perform emergency caesarean delivery readily available at all times • Anesthesia providers, such as anaesthesiologists, or anaesthesiologist assistants working with an anaesthesiologist for labour analgesia and surgical Anesthesia readily available at all times.

		• Clinical Dietitian. • Physiotherapist (optional).
Level II - Specialty Care	<u>Level I capabilities plus:</u> • Provide care to high-risk pregnancies and for pregnant women at thirty two (32) gestational weeks and above, unless an emergency medical condition exists. • Standard obstetric ultrasound imaging interpretation readily available at all times. • Computed tomography scan, magnetic resonance imaging, non-obstetric ultrasound imaging, and maternal echocardiography with interpretation readily available daily (at all times not required).	• Consultant/Specialist Obstetrician and Gynecologists. • Consultant/Specialist Pediatrician or Neonatologist • Consultant/Specialist Anaesthetist. • Prompt and readily available DHA licensed Medical and Surgical specialties and Maternal and Foetal Medicine Subspecialists either by onsite consultation or by telemedicine, if needed. • Registered midwife (RM) or assistant midwife (AM) or registered nurse (RN) or assistant nurse (AN) with experience in obstetric care and holding an active Neonatal Resuscitation Program (NRP). • Anaesthesiologist • Physiotherapist. • Social worker (optional).
Level III - Subspecialty Care	Level II capabilities plus: • Provide care to more complex obstetric and foetal cases as well as pregnant women at less than thirty two (32) gestational weeks.	Level II healthcare professionals plus: • Consultant/Specialist in Critical Care Medicine. • Prompt and readily available full range of medical – surgical subspecialists based upon the medical needs of the patient in

	• Computed tomography scan, magnetic resonance imaging, non-obstetric ultrasound imaging, and maternal echocardiography with interpretation readily available at all times. • Have medical and surgical Intensive Care Units (ICUs). • Provide ventilation and ability to stabilize the patient in labour and delivery until transferred safely to ICU when needed.	critical care, general surgery, neurosurgery, cardiac surgery, infectious disease, haematology, cardiology, nephrology, neurology, and neonatology.

APPENDIX 2: BOOKING RISK ASSESSMENT TOOL

Name:		Mobile:	
Date:		L.M.P:	Husband name:
Gravida:	Para:	EDD:	Husband mobile:

Note:

- Women who score under 10 may be offered care in outpatient facility under the supervision of obstetrician/family medicine physician as low risk care; this should be explained to the mother and documented in the health record.
- If a woman's risk score is 10 or more she should be advised to have referral for specialist/consultant obstetric and gynecologist in hospital setting.
- Risk factors should be continually reviewed throughout pregnancy period and some women may request/need to be referred to specialist/consultant obstetric and gynecologist in hospital setting.

Booking Criteria	Risk score
Present Pregnancy	
Under 15 years OR Over 40 years at delivery	10 8
Misuse of illicit substances/alcohol	10
Smoking	4
Body Mass Index (BMI) 40 or over, OR less than 18	10
Haemoglobinopathy / severe anaemia	10
Blood pressure of more than 140/90 at booking	10
Multiple pregnancy	10

Booking Criteria	Risk score
Previous Pregnancies/Labours /Births	
3 or more proven miscarriages/ + mid-trimester	10
Para 7 or more	10
Previous last baby at term of less than 2.5kgs, IUGR, IUD, NND, SB, cerebral palsy	10
Eclampsia or HELLP syndrome, PIH	5
Admission to ITU or HDU (pregnancy related)	5
Rhesus/ABO antibodies	10

History of infertility: 1. conception – spontaneous, clomid(singleton) 2. In Vitro Fertilization (IVF), Gamete Intrafallopian Transfer (GIFT), Intracytoplasmic Sperm Injection (ICSI).	5 10
Women who request diagnostic testing(i.e. family history of genetic disorder) e.g. amniocentesis, Chorionic Villus Sampling (CVS)	10
Booking Criteria	**Risk score**
Previous Pregnancies/Labours /Births (continue)	
3rd or 4th degree tear (be aware for delivery)	5
Shoulder Dystocia / Previous baby affected by Group B streptococcus – last birth (be aware for delivery)	5
2 or more caesarean sections	10
Postpartum haemorrhage, (aware for delivery)	5
Previous baby with structural abnormality	10
Medical History	

Fetal loss after 22 weeks	10
Placental abruption	10
Preterm labour in last pregnancy before 35weeks	10
Previous obstetric cholestasis	10
HIV positive / Syphilis positive	10
Essential hypertension	10
Neurological disease e.g. epilepsy	10
Previous confirmed DVT/ Pulmonary embolism	10
Booking Criteria	**Risk score**
Surgical History	
Anaesthetic Problem (be aware)	5
Surgery to cx: cone biopsy/Letz, colposcopy	10
Uterine surgery such as myomectomy	10
Vaginal Surgery (TVI, TOT - be aware for delivery)	5
Family History	
Diabetes Type 1 and Type 2 - GTT at 28 weeks	0

Cardiac Disease	10
Diabetes Gestational Diabetes in any pregnancy	10 4
Endocrine problems e.g. thyroid disease	8
Severe gastrointestinal disease e.g. ulcerative colitis	10
Serious psychiatric illness (excluding women on SSRI drugs e.g. Prozac and previous postnatal depression)	10
Asthma, taking oral steroids	10
Major kidney disorder / liver disease	10
Detached Retina	10
Fractured Pelvis (be aware for delivery)	4
Autoimmune disease	10
Uterine abnormality / fibroids / pelvic mass / IUCD in situ	10

TOTAL SCORE	
Model of care	.....
Suitable for low risk care	
Physician name.....	
Designation.....	
Signature.....	
Referral for high risk care	
Health Facility name:	
Physician name:	
☐ Urgent/within a week ☐ Within 3- 4 weeks	
Hospitals Appointment Date: ..... Time:	

Continuing Risk Assessment Tool Reference for Each Visit	
Woman who score under 10 are low risk. The urgency of the follow-up appointment is according to a risk score of 10 or more at the discretion of the booking doctor. Risk factors should be continually reviewed throughout pregnancy	
Complication Arising / Developing During Current Pregnancy	**Risk Score**
Unclear EDD	4
Blood group antibodies	10
Positive VDRL/ HEP B C/HIV	10
Distorted serum HCG/ □ AFP / □ UE3	10
Hypertension	10
Proteinuria without UTI OR hypertension	10
Anaemia <9G	8
Low platelet count < 120 X 10^9	8
ABNORMAL GTT	10
Pre term spontaneous ruptured membranes	10
□ Small for dates □ Large for dates	10
LOW lying placenta covering the OS or persisting after 32 weeks follow follow-up scan / APH	10
Confirmed chickenpox/rubella/parvo infection	10
Polyhydramnios	10
Oligohydramnios	10
Malpresentation after 36 weeks	10
Obstetric cholestasis	10
Threatened pre-term labour	8
Intrauterine foetal death	4
Enter the risk score on the follow up notes	

APPENDIX 3: HIGH RISK PREGNANCIES

These are essentially situations in which the potential for maternal and/or neonatal compromise is predictable and delivery can be planned appropriately. The list is not exhaustive but includes:

1. **Maternal conditions**
   - 1.1 Insulin dependent diabetes or poorly controlled gestational diabetics
   - 1.2 Hypertensive states – pre-eclampsia, unstable essential hypertension
   - 1.3 Unstable epilepsy
   - 1.4 Cardiac disease
   - 1.5 Thyrotoxicosis
   - 1.6 Morbid obesity (BMI > 40)
2. **Obstetric conditions**
   - 2.1 Multiple pregnancy
   - 2.2 Acute fatty liver, haemolytic uraemic syndrome
   - 2.3 Placenta previa
   - 2.4 Suspected placenta accreta or percreta
   - 2.5 Previous caesarean sections =/> 2
3. **Fetal conditions**
   - 3.1 Congenital anomaly requiring surgery or ICU support at delivery
   - 3.2 Prematurity – preterm labour <37 weeks
   - 3.3 Pre-term rupture of membranes, chorioamnionitis
   - 3.4 Fetal hydrops RH isoimmunisation
   - 3.5 Significant IUGR (estimated birth weight <5th centile)
   - 3.6 Other evidence foetal compromise – severe oligohydramnios
   - 3.7 Absent/reverse diastolic flow on umbilical Doppler

APPENDIX 4: GUIDELINE ON THE LOW RISK ANTENATAL CARE MODEL

Low Risk Antenatal Care Model		
10-14 weeks Primipara Multipara	Obstetric and Gynecologist/ Family Medicine	• Confirmation of pregnancy • History and full physical examination • Dating scan • Complete Booking Risk Assessment Tool • (Offer 1st trimester genetic screening at 11-13 weeks) • Discussion of Low Risk care Initial Investigations • FBC and Platelets • Blood group, Rhesus status and antibodies (if negative, husband blood group and Rh status may be requested) • VDRL • MSU and urinalysis • Rubella serology • HIV • HBsAg • Hepatitis C offered to high risk patients • GTT if high risk • FBS, random or HbA1c Make scan appointment for 18-20 weeks at Outpatient facilities / Hospital Next appointment: 16 weeks primipara and multipara
16 weeks Primipara Multipara	Obstetric and Gynecologist/ Family Medicine	Antenatal review and risk status, record results
18 – 20 weeks Primipara Multipara	Obstetric and Gynecologist/ Family Medicine	Detailed anomaly scan

25 weeks Primipara	Obstetric and Gynecologist/ Family Medicine	• Antenatal review and risk status (record results, multiparas) • Fetal growth surveillance • Repeat GTT for high risk patient if normal at first visit • Review ultrasound result (change EDD ONLY if ultrasound scan is 10 days different to menstrual dates
Low Risk Antenatal Care Model		
28 weeks Primipara Multipara	Obstetric and Gynecologist/ Family Medicine	• Antenatal review and risk status • Fetal growth surveillance • F.B.C. and Platelets • Rhesus antibody screen **If Rhesus negative, give Anti D, one dose (28-30 wks.)** • Review ultrasound result (change EDD ONLY if ultrasound scan is 10 days different to menstrual dates
31 weeks Primipara	Obstetric and Gynecologist/ Family Medicine	• Antenatal review and risk status • Fetal growth surveillance
34 weeks Primipara Multipara	Obstetric and Gynecologist/ Family Medicine	• Antenatal review and risk status • Fetal growth and surveillance
36 weeks Primipara Multipara	Obstetric and Gynecologist/ Family Medicine	• Antenatal review and risk status • Confirm presentation • Fetal growth surveillance • Low vaginal swab for group B haemolytic streptococcus **Make appointment for Hospital**
38 weeks Primipara Multipara	General hospital OR specialty hospital	• Antenatal review and risk status • Confirm presentation • Fetal growth surveillance
40 weeks Primipara Multipara	General hospital OR specialty hospital	• Antenatal review and risk status • Confirm presentation • Fetal growth surveillance **Make appointment for Hospital for 41 weeks**

APPENDIX 5: WHO SAFE CHILDBIRTH IMPLEMENTATION GUIDE

Medications/injections/drips

Crash Cart with all Emergency Drugs

IV Fluids

Dinoprostone (Prostin E2) Tablet
Dinoprostone (Propess) — For Induction of Labour

Injectable Oxytocin → Augmentation of Labour and Prophelaxices/ Management of Postpartum Hemorrhage (PPH)

Injection Methergin
Injection Carbetocin (Pabal)
Injection Carboprost (Hemabate) — Prophelaxices and Management of PPH

Injection Lidocaine.

Injection Scopinal.

Injection Rantidine.

Injection Premosan

Injectable Magnesium Sulfate

Antibiotics for Mother (availability in the hospital)

Antibiotics for Infant (availability in the hospital)

Antihypertensive (injection Labetalol, injection Hydralazine)

Medications for pain management.

Narcotics (Fentanyl, Pethidin)

Controlled drugs (Injection Dormicum, Injection Tramal)

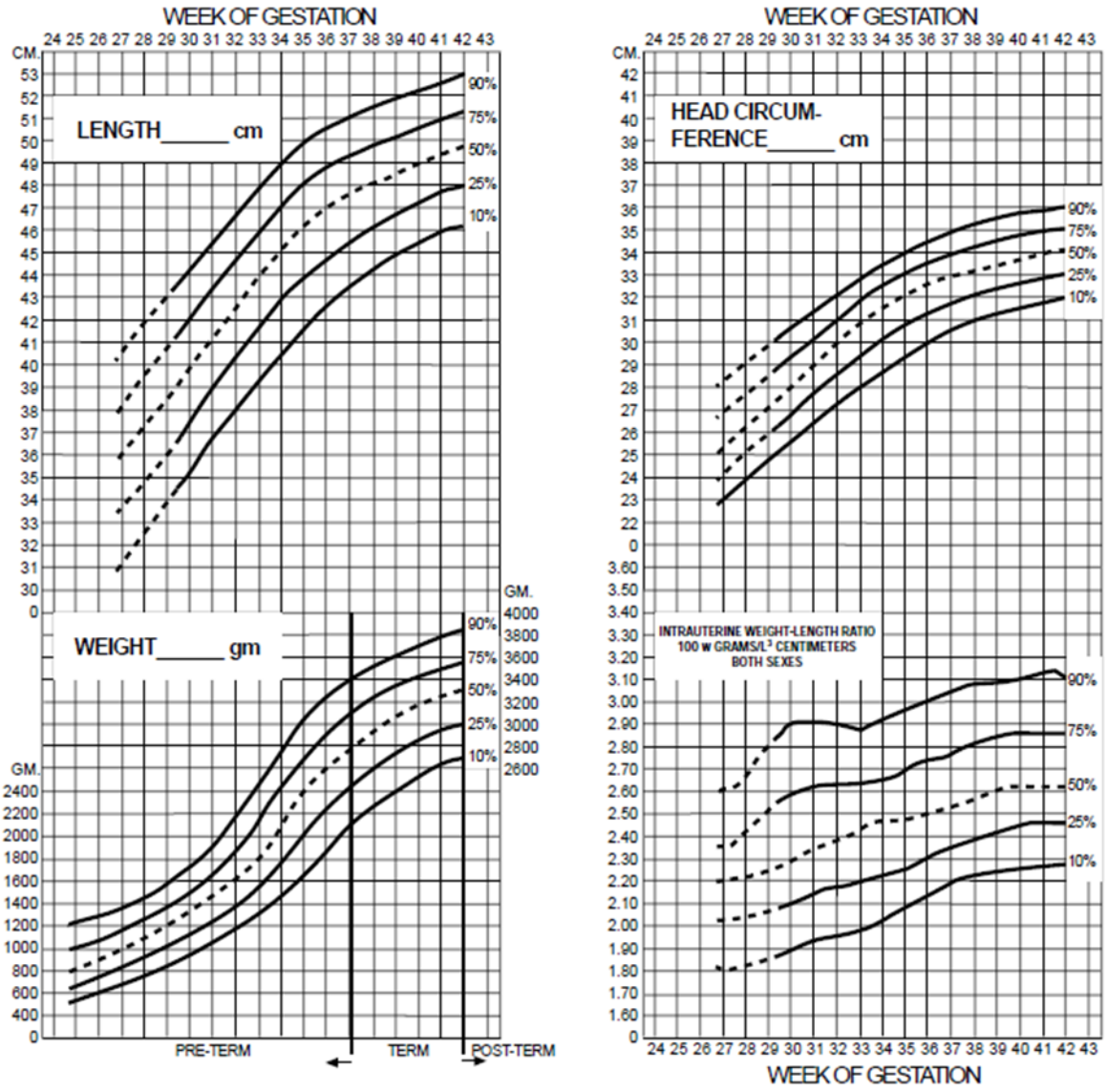
APPENDIX 6: LEVELS OF NEONATAL CARE, CAPABILITIES AND HEALTHCARE PROFESSIONALS

Level of care	Capabilities	Healthcare professionals
Level I–Basic care (Well new-born nursery)	• Provide neonatal resuscitation at every delivery • Evaluate and provide postnatal care to stable term new-born infants • Stabilize and provide care for infants born 35–37 gestational age who remain physiologically stable. • Stabilize new-born infants who are ill and those born at <35 weeks gestation until transfer to a higher level of care.	• Consultant/Specialist Neonatologist **OR** • Consultant Pediatrician with last 3 years' experience in neonatology • Specialist Pediatrician with last 5 years' experience in neonatology • Physician coverage in Neonatal Unit available in the hospital on 24/7 basis: a. Specialist Pediatrician with neonatology last 2 years' experience in neonatology **OR** b. GP with master degree in Pediatric with approved specialty degree listed under Tier 3 or more as per PQR with last 2 years' experience in pediatric and neonatology c. Registered nurse with experience in neonatology not less than 2 years (or neonatal nurse).
Level II–Specialty care (Special care nursery)	Level I capabilities plus: • Provide care for infants born ≥32 week's gestation and weighing ≥1500g who have physiologic immaturity OR who are moderately ill with problems that are expected to resolve rapidly and are not	• A minimum of 2 tertiary neonatal consultants to cover the unit when one is away. • Consultant/Specialist Neonatologist **OR** • Consultant Pediatrician with last 7 years' experience in neonatology. • Physician coverage in Neonatal Unit available in the hospital on 24/7 basis:

	anticipated to need subspecialty services on an urgent basis. • Provide care for infants convalescing after intensive care. • Provide mechanical ventilation for brief duration (<24 hours) OR continuous positive airway pressure or both. • Stabilize infants born before 32 weeks gestation and weighing less than 1500 g until transfer to a neonatal intensive care facility.	a. Specialist Pediatrician with last 2 years' experience in neonatology. b. Licensed GP with master degree in pediatric with approved specialty degree listed under Tier 3 or more as per PQR with last 3 years' experience in pediatric and neonatology. • Registered nurse (RN) or registered midwife (RM) with experience in obstetric care and holding an active Neonatal Resuscitation Program (NRP.) • Respiratory Therapists (optional) Clinical Dietician
Level III– Subspecialty intensive care (NICU)	Level II capabilities plus: • Provide sustained life support • Provide comprehensive care for infants born <32 weeks gestation and weighing <1500 g and infants born at all gestational ages and birth weights with critical illness • Provide prompt and readily available access to a full range of pediatric medical subspecialists, pediatric surgical specialists, anaesthesiologists, and ophthalmologists • Provide a full range of respiratory support that may include conventional and/or high-	• Consultant Neonatologist (head of the unit) • DHA licensed specialist Neonatologist with 5years experience in neonatology. • Physician coverage in Neonatal Unit available in the hospital on 24/7 basis: a. DHA licensed specialist Pediatrician with last 3 years' experience in neonatology. b. Licensed GP with master degree in pediatric with approved specialty degree listed under Tier 3 with last 2 years' experience in pediatric and neonatology. • Pediatric medical subspecialists* • Pediatric surgeons' specialists*

	frequency ventilation and inhaled nitric oxide • Perform advanced imaging, with interpretation on an urgent basis, including computed tomography, MRI, and echocardiography.	• Anaesthesiologists* • Ophthalmologists* *At the site or at a closely related hospital by prearranged consultative agreement. • Respiratory Therapists (optional)

CLASSIFICATION OF NEWBORNS -
BASED ON MATURITY AND INTRAUTERINE GROWTH Side 2
Symbols: X - 1st Exam O - 2nd Exam



	1st Exam (X)	2nd Exam (O)
LARGE FOR GESTATIONAL AGE **(LGA)**		
APPROPRIATE FOR GESTATIONAL AGE **(AGA)**		
SMALL FOR GESTATIONAL AGE **(SGA)**		
Age at Exam	hrs	hrs
Signature of Examiner	M.D./R.N.	M.D./R.N.

APPENDIX 7: CLASSIFICATION OF NEWBORNS

APPENDIX 8: NEWBORN MATURITY RATING AND CLASSIFICATION

NEWBORN MATURITY RATING & CLASSIFICATION

ESTIMATION OF GESTATIONAL AGE BY MATURITY RATING
Symbols: X - 1st Exam O - 2nd Exam

Side 1

Gestation by Dates _____ wks

Birth Date _____ Hour _____ am / pm

APGAR _____ 1 min _____ 5 min

NEUROMUSCULAR MATURITY

	-1	0	1	2	3	4	5
Posture							
Square Window (wrist)	>90°	90°	60°	45°	30°	0°	
Arm Recoil		180°	140°-180°	110°-140°	90°-110°	<90°	
Popliteal Angle	180°	160°	140°	120°	100°	90°	<90°
Scarf Sign							
Heel to Ear							

PHYSICAL MATURITY

Skin	sticky; friable; transparent	gelatinous; red; translucent	smooth; pink; visible veins	superficial peeling &/or rash; few veins	cracking; pale areas; rare veins	parchment; deep cracking; no vessels	leathery; cracked; wrinkled
Lanugo	none	sparse	abundant	thinning	bald areas	mostly bald	
Plantar Surface	heel-toe 40-50 mm: -1 <40 mm: -2	>50 mm; no crease	faint red marks	anterior transverse crease only	creases ant. 2/3	creases over entire sole	
Breast	imperceptible	barely perceptible	flat areola; no bud	stippled areola; 1-2 mm bud	raised areola; 3-4 mm bud	full areola; 5-10 mm bud	
Eye/Ear	lids fused loosely: -1 tightly: -2	lids open; pinna flat; stays folded	sl. curved pinna; soft; slow recoil	well-curved pinna; soft but ready recoil	formed & firm; instant recoil	thick cartilage; ear stiff	
Genitals male	scrotum flat; smooth	scrotum empty; faint rugae	testes in upper canal; rare rugae	testes descending; few rugae	testes down; good rugae	testes pendulous; deep rugae	
Genitals female	clitoris prominent; labia flat	prominent clitoris; small labia minora	prominent clitoris; enlarging minora	majora & minora equally prominent	majora large; minora small	majora cover clitoris & minora	

MATURITY RATING

score	weeks
-10	20
-5	22
0	24
5	26
10	28
15	30
20	32
25	34
30	36
35	38
40	40
45	42
50	44

SCORING SECTION

	1st Exam=X	2nd Exam=O
Estimating Gest Age by Maturity Rating	_____ Weeks	_____ Weeks
Time of Exam	Date _____ am Hour _____ pm	Date _____ am Hour _____ pm
Age at Exam	_____ Hours	_____ Hours
Signature of Examiner	_____ M.D./R.N.	_____ M.D./R.N.

APPENDIX 9: NEWBORN COMPREHENSIVE PHYSICAL EXAMINATION

- The newborn comprehensive physical examination varies according to specific patient needs, but typically include the followings:

1. Review the New-born's scores of Dubowitz/Ballard Exam for Assessment of the Gestational Age and Apgar.
2. Assessment of the newborn risk factors.

High Risk Newborn

a. Birth before 37 weeks or after 42weeks gestation.
b. Birth weight <1800 or >4000gm.
c. Deviations in expected size for stage of development.
d. History of foetal neonatal sibling death or serious illness.
e. Poor condition at delivery (Apgar 0 – 4 at 1min) or resuscitation required at delivery or subsequently.
f. History of maternal infection or other illness during pregnancy ,premature raptures of membranes, serve social problems (e.g. Teenage pregnancy, drug addiction),absent or late prenatal care ,abnormal gestational weight gain, prolonged infertility, four or more previous pregnancies, 35yrs or more maternal age (especially if primiparous),or ingestion of drugs, multiple pregnancy or gestation commencing within 6mo of a previous pregnancy.
g. Delivery by caesarean section or any unusual obstetrical complications, including hydramnios, abruption placentae, placenta previa, or abnormal presentation.
h. Significant malformation or suspicion of malformation.
i. Anaemia or blood group incompatibility.
j. Severe maternal emotional problems, such as hyperemesis gravidarum.
k. Serious accidents or general anaesthesia during pregnancy.

3. General Observation

a. Level of consciousness (breathing or crying)

b. General Appearance (resting posture, tone, spontaneous activity, respiratory efforts).
c. Skin (colour, texture, nails, presence of rashes or birthmarks).
d. Facies at rest.

4. Measure the newborn' s vital signs
   a. Body Temperature
   b. Blood Pressure
   c. Heart Rate
   d. Respiratory Rate
   e. Oxygen saturation using pulse oximetry

5. Extensive anthropomorphic measurements should be measured, these are;
   a. Occipital frontal circumference
   b. Height
   c. Weight
   d. Abdominal Circumference.

6. Head and Neck Region
   a. Head
      i. Appearance, shape, presence of moulding
      ii. Trauma of the skull
      iii. Head Circumference
      iv. Fontanels.
   b. Eyes
      i. Pupil response to light
      ii. Corneal Opacities
      iii. Red Reflex
      iv. Symmetrical funduscopic examination.
   c. Shape of the nose and patency of nares.
   d. Mouth- palate, mucosa, tongue, throat.

e. Ears, including Assessment of tympanic membranes.

f. Neck

i. Webbing

ii. Thyroid gland size

iii. Clavicles.

7. Thorax

a. Shape to detect any a symmetry and integrity of skin. Palpate bony structures.

b. Breasts to detect any a symmetry in shape, enlargements, discharge per nipples.

8. Respiratory System

a. Breath sounds.

9. Cardiovascular System

a. Heart sounds, Rate, Rhythm

b. Murmurs

c. Femoral pulse and peripheral pulses.

10. Abdomen

a. Shape and size of abdomen

b. Organs sizes

c. Abnormal masses

d. Condition of the Umbilical Cord.

11. Genitalia and Anus

a. Genitalia for shape and size.

b. Anus for patency.

c. Undescended testicles in males.

12. Spine

a. Intact spine

b. Shape to detect any a symmetry and palpate bony structures.

13. Extremities

a. Proportion and symmetry
b. Specific measurement of any joint limitations
c. Polydactyly, syndactyly and palm creases
d. Foot deformities

14. Hips

a. Asymmetry of the limbs and skin folds.
b. Barlow and Ortolani's manoeuvres.

15. Skin for abnormalities, which often includes Woods light examination of fluorescent hypo pigmented areas.

16. Central Nervous

a. Tone, Behaviour, Movements and Posture
b. Newborn reflexes:
    i. Sucking and swallowing reflex
    ii. Rooting reflex
    iii. Tonic neck reflex
    iv. Palmar grasp reflex
    v. Moro Reflex
    vi. Babinski reflex
    vii. Stepping reflex
c. Tendon reflexes.

APPENDIX 10: PROCEDURE FOR BLOOD SPOT SPECIMEN COLLECTION (HEEL PRICK TESTING)

Source of blood

Infant's heel using the most medial or lateral portion of the plantar surface of the heel

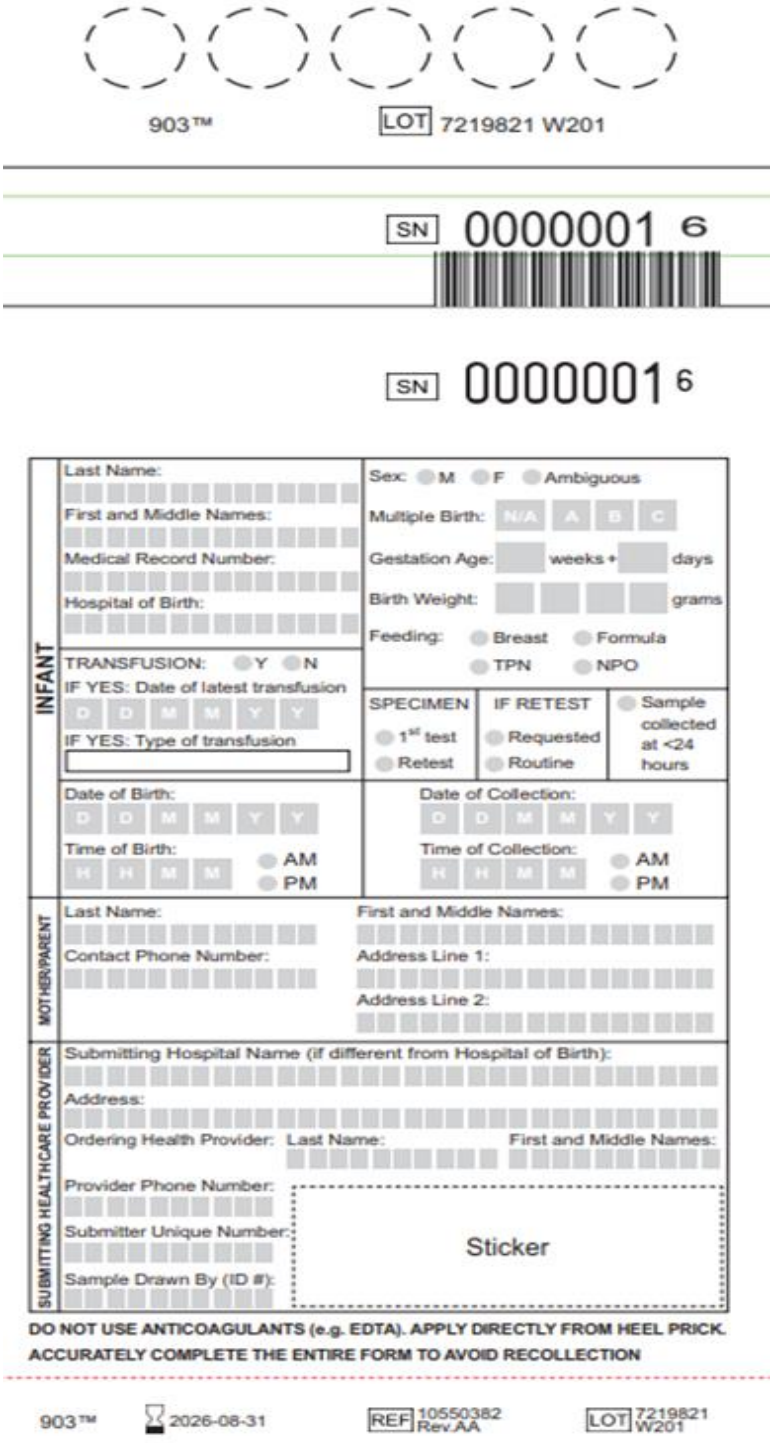
For a satisfactory newborn screening specimen:

- Collect the required number of uniform blood spots (currently 5)
- Do not reapply or apply more than one drop of blood in a partially filled circle as this may result in layering
- Each of the five 11 mm circles on the DBS card requires approximately 75 uL to 100 uL of blood to fill
- The blood must fully soak through to the back of the filter paper. No areas of white should be visible on the front or back of the circle
- The blood can go outside the circle boundary line, however, do not allow it to overlap on blood from adjacent circle
- Recollect immediately if tiny clots appear on the specimen or if the specimen is contaminated with any fluid or substance.

Poor quality specimens can potentially delay the detection and treatment of an affected infant and could contribute to a missed or late diagnosed case.

Ensure that the following fields on the newborn screening requisition form are completed:

- Patient identification (e.g. MRN)
- Patient's last name
- Gender
- Date and time of birth (in hours)
- Date and time of collection (in hours)
- Patient weight (grams)
- Gestational age (weeks)
- Transfusion status including date (if applicable)
- Multiple birth status
- Parent/Guardian information
- Submitting Health Care Provider's name and address



APPENDIX 11: TIMING OF SAMPLE COLLECTION UNDER DIFFERENT CIRCUMSTANCES

Full Term Infants	A newborn screening test should be collected when the infant is 24-48 hours of age. If the infant is discharged prior to 24 hours of age, a specimen MUST be obtained before discharge, and the parent or guardian must be informed of the importance of obtaining a repeat test before one week of age.
Home Births	The newborn screening statute applies to all infants born. The birthing attendant is responsible for collecting the newborn screening test. It is recommended that the test be collected at 24-48 hours of age. Parents could also bring the newborn to a health care centre for screening.
Extended Hospital Stay (low birth weight/ sick infants)	It is recommended that a specimen be collected upon admission to the NICU if the infant is expected to receive TPN or transfusions unless the infant is so unstable that it cannot be done safely.
Transitioning Infants	Infants admitted to NICU for short term observation but who are not receiving TPN or transfusions should have a specimen collected according to the full-term infant protocol.
Dying Infants	If an infant is likely to die, it is appropriate to collect a newborn screening specimen. While dying infants may have abnormal results as a response to organ failure, the specimen may also provide a diagnosis of an early onset screening disorder.
Premature (< 33 weeks) or very low birth weight (< 500g)	A first newborn screening specimen should be collected between 24 and 48 hours of age. A second specimen should then be collected at 3 weeks of age or when the infant is being discharged home from the hospital, whichever comes first.

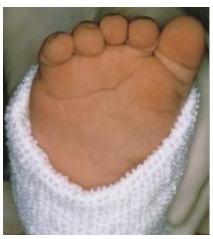
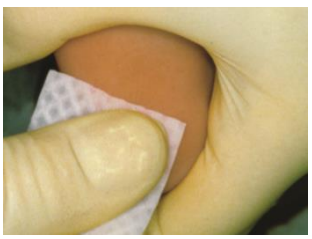
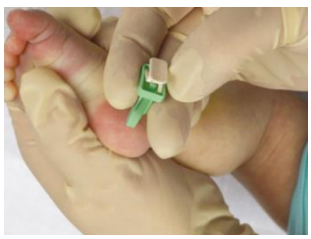
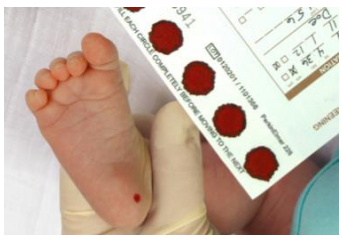
Transfused Infants	A specimen should be collected prior to transfusion regardless of age or treatments unless the infant is so unstable it cannot be done safely. If the specimen is not collected prior to transfusion, collect a specimen greater than 72 hours post transfusion. Another specimen should be collected at 3-4 months post transfusion for Hemoglobinopathies, Biotinidase Deficiency, and Galactosemia. If a Galactosemia condition is suspected and the specimen was not collected prior to transfusion, place the infant on a galactose-free diet until a definitive diagnosis can be made.
Transferred Infants	The transferring facility must collect a specimen prior to transfer regardless of age or treatments unless the baby is so unstable that it cannot be done safely. If the specimen cannot be obtained prior to transfer, the transferring facility must ensure that the next facility is aware of the need for collection of the newborn screening specimen.
Parent Refusal	Parents who refuse screening should sign a statement that is placed in the infant's medical record. A newborn screening collection form should be filled out completely with a statement as to the refusal and kept in the baby's medical records. Notify DHA

APPENDIX 12: EQUIPMENT REQUIRED FOR BLOOD SPOT SPECIMEN COLLECTION

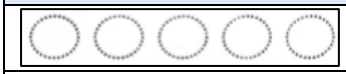
Required equipment

- Sterile lancet with tip less than 2.4m long
- Sterile 70% alcohol pads
- Sterile gauze pads
- Warm, moist towel or compress
- Fully completed, in-date filter paper blood card
- Sterile gloves

Step 1: Warm the newborn's heel (skin puncture site) for 3-5 minutes with a warm, moist towel no hotter than 42°C. This will help increase the blood flow.
Step 2: Disinfect the puncture site area with a sterile alcohol pad (isopropanol/water: 70/30 by volume, "70%"). Allow the skin to air dry.
Step 3: To obtain sufficient blood flow, puncture the lateral aspect of the infant's heel on the plantar surface with a sterile lancet or with a heel incision device. The incision device provides excellent blood flow by making a standardized incision 1.0mm deep by 2.5 mm long.
Step 4: After the heel has been punctured, wipe away the first drop of blood with a sterile gauze pad or cotton ball. Allow a second large blood drop to form by intermittently applying gentle pressure as the drop of blood forms.
Step 5: Lightly touch the filter paper gently against the second large blood drop and, in one step, allow a sufficient amount of blood to soak through and completely fill one of the pre-printed circles on the filter paper. Fill all remaining circles using the same technique. If blood flow diminishes repeat steps 3 and 4.

APPENDIX 13: UNSATISFACTORY SPECIMENS DUE TO SAMPLE QUANTITY/QUALITY

Unacceptable Specimens	Description	Possible Cause(s)
	**No blood**	• Failure to obtain any blood
	**Quantity of blood insufficient**	• Filter paper circle incompletely filled or not saturated • Blood applied to filter paper with needle or capillary tube • Contamination of surface of filter paper circle
	**Scratched or abraded blood spots**	• Blood applied improperly with capillary tube or by other means
	**Wet or discoloured blood spots**	• Specimen not properly dried before mailing
	**Supersaturated blood spots**	• Excess blood applied to the filter paper, usually with capillary tube or needle • Blood applied to both sides of the filter paper
	**Diluted blood spots**	• Puncture site squeezed or “milked” to expel blood • Exposure of blood spots to direct heat • Contamination of filter paper before or after blood collection by gloved or ungloved hands or by substances such as alcohol, feeding or antiseptic solutions, hand lotion or powder
	**Clotted or layered blood spots**	• Touching the same filter paper circle to a blood drop several times • Filling the circle from both sides of the filter paper

	**Serum rings evident in blood spots**	• Alcohol not allowed to dry completely before skin puncture is made • Allowing filter paper to come in contact with alcohol, water, hand lotion, etc. • Squeezing the area around the puncture site excessively • Drying the specimen improperly • Applying blood to filter paper with a capillary tube