حكومة دبي
GOVERNMENT OF DUBAI

هيئة الصحة بدبي
DUBAI HEALTH AUTHORITY

Standards for Obstetric and Neonatal Services

Health Regulation Department

2018

800342 (DHA) | dha.gov.ae
@dha_dubai
Dubai Health Authority

BACKGROUND

Dubai Health Authority (DHA) is the responsible entity for regulating, licensing and monitoring health facilities and healthcare professionals in the Emirate of Dubai. The Health Regulation Department (HRD) is an integral part of DHA and was founded to fulfil the following overarching strategic objectives:

Objective # 1: Regulate the Health Sector and assure appropriate controls are in place for safe, effective and high quality care.

Objective # 2: Position Dubai as a global medical destination by introducing a value-based, comprehensive, integrated and high quality service delivery system.

Objective #3: Direct resources to ensure happy, healthy and safe environment for Dubai population.

ACKNOWLEDGMENT

This document was developed by the HRD in collaboration with Subject Matter Experts. The Health Regulation Department would like to acknowledge and thank these professionals for their dedication toward improving the quality and safety of healthcare services.

The Health Regulation Department

Dubai Health Authority

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Dubai Health Authority (DHA) is pleased to present the Obstetric and Neonatal Standards which represents a milestone towards fulfilling DHA's strategic objectives to improve quality and patient safety standards in health facilities and promote programs that reduce medical errors.

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. The key changes in this document are listed below:

1. The document has been divided into five main standards that include:
    - **Standard 1:** Health Facility Design Requirements
    - **Standard 2**: Obstetric Service Requirements
    - **Standard 3:** Neonatal Service Requirements
    - **Standard 4:** General Service Requirements
    - **Standard 5:** Key Performance Indicators
2. Adoption of definitions including but not limited to:
    - Critical Congenital Heart Defects (CCHD) screen
    - Newborn infant OR neonate
    - Stillbirth
    - High dependency unit
3. Emphasis has been placed on the levels of care, inclusion of special care rooms, fall management, medication manamgent, medical records, patient discharge and performance metrics to guide services and healthcare professionals to safe, high quality services.

DEFINITIONS/ABBREVIATIONS

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 foetus 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.

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. Also known as Dubowitz score.

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.

Deceased refers to a dead person.

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, it is appropriate for patients who have had major surgery 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 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 refers to all aspects of antenatal, intrapartum, and postnatal care of pregnant woman.

Postnatal care refers to care received from healthcare professionals for women after childbirth. Also known as postpartum care.

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

AII	:	Airborne Infection Isolation
AN	:	Assistant Nurse
AM	:	Assistant Midwife
BCG	:	Bacilli Calmette-Guérin
BLS	:	Basic Life Support
CCHD	:	Critical Congenital Heart Disease
CT scan	:	Computed Tomography Scan
CTG	:	Cardiotocography
DHA	:	Dubai Health Authority
ECG	:	Electrocardiogram
FGI	:	Facility Guidelines Institute
GP	:	General Practitioner
HIV	:	Human Immunodeficiency Virus
ID	:	Identification
IV	:	Intravenous
LDR	:	Labor Deliver Recovery
LDRP	:	Labor Deliver Recovery Postpartum
MFM	:	Maternal-Fetal Medicine
MRI	:	Magnetic Resonance Imaging
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
UAE	:	United Arab Emirates
WHO	:	World Health Organization

INTRODUCTION

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. Maternal and infant mortality are major indicators of health system performance. Emphasis was placed on improving clinical outcomes through continuous learning. However, there is still more that needs to be done to reduce infant mortality and disability. Timely access to care, adoption of best practice and the availability of data collection systems have all been associated with an improvement in patient safety and the quality of care resulting in an overall reduction of neonatal and perinatal mortality. Variations in care can be assessed by monitoring structure, process and overall outcomes as described in this document. These standards take account of the full care pathway from pre-pregnancy, through pregnancy and possible complications, to postnatal and neonatal care but are not intended to dictate information related to the clinical steps necessary in providing obstetric and neonatal care.

Obstetric services can be divided into antenatal, intrapartum, and postnatal care. In order to standardize the care levels in the Emirates of Dubai; DHA has adopted the following classification of obstetric and neonatal care.

Levels of Obstetric Care	Levels of Neonatal Care
Level I - Basic care	Level I - Basic care
Level II - Specialty care	Level II - Specialty care
Level III - Subspecialty care	Level III and/or level IV - Subspecialty care

Health facilities providing or opting to provide intrapartum obstetric services shall maintain neonatal care units equivalent to the level of obstetric care provided. Any health facility opting to provide obstetric and neonatal care in the Emirates of Dubai, shall maintain at least Level I of obstetric and neonatal care to be authorized to provide the service. An online application via the licensing system should be submitted to HRD identifying the required level of service. If the health facility intends to change the level of care, another application must be submitted to HRD.

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

- General hospitals
- Specialty hospitals with obstetrics and gynaecologist specialty
- Outpatient facilities including primary health centres

DHA permits intrapartum services to be performed only in:

- General hospitals
- Specialized hospitals with Obstetrics and Gynaecology specialty

PURPOSE

1. To outline the criteria that shall be fulfilled by the health facilities providing or opting to provide antenatal, intrapartum, postnatal and neonatal services.
2. To ensure delivery of safe, high quality care and optimum clinical outcomes for well and unwell newborn infants of all gestational ages and their families.

SCOPE

All health facilities offering antenatal, intrapartum (labor and delivery), postnatal and neonatal services in the Emirates of Dubai including governmental, semi-governmental, private, and free zone which under DHA jurisdiction.

APPLICABILITY

These standards are applicable to all DHA licensed Healthcare Professionals (HP) and Health Facilities providing Obstetric and Neonatal services under the jurisdiction of DHA.

STANDARD ONE: HEALTH FACILITY DESIGN REQUIREMENTS

1. OBSTETRIC UNIT DESIGN

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

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

1.3. 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.

1.4. In shared inpatient rooms, the enclosed area for each bed shall be provided with curtains to ensure patient privacy. Such area should be at least 7.5 square meters.

1.5. Each LDR and Labor Deliver Recovery Postpartum (LDRP) room shall be for single occupancy and shall have a minimum clear floor area of 31.57 square meters with a minimum clear dimension of 3.96 square meters.

1.6. The infant stabilization and resuscitation space shall have designated area in the LDR or LDRP room that is distinct from the mother's area. This should include an infant stabilization and resuscitation space with a minimum clear floor area of at least 3.7 square meters. Space consideration shall be made whenever a crib and reclining chair are provided in the LDR and LDRP room.

1.7. Each room shall be provided with natural light by means of a window to the outside. The minimum net glazed area shall be not less than 8 percent of the floor area of the room served.

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

1.8.1. Delivery bed

1.8.2. Birthing light

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

1.8.4. Nurse call system

1.8.5. Emergency call system

1.8.6. Telephone or communication system

1.8.7. 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).

1.8.8. Hand Hygiene

1.9. 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. The caesarean delivery room shall have a minimum clear floor area of 40.85 square meters with a minimum clear dimension of 4.88 meters. Infant resuscitation space shall be provided in the caesarean delivery room. If provided separate, the infant

resuscitation space should be immediately accessible to the caesarean delivery room and shall have a minimum clear floor area of 13.94 square meters.

1.10. The scrub facility shall be located adjacent to caesarean delivery room.

1.11. Separate staff changing area for males and females.

1.12. A minimum of two recovery spaces shall be provided for caesarean delivery suits, with a minimum clear floor area of 7.43 square meters shall be provided for each bed.

1.13. Patient rooms in the postnatal unit shall have the minimum clear floor area of 13.94 square meters in single-bed rooms, and 11.52 square meters per bed in multiple-bed rooms postnatal rooms.

1.14. Newborn nursery room (if provided) should contain no more than sixteen (16) infant stations.

1.15. Postnatal wards shall have a dedicated area for neonatal resuscitation facilities.

1.16. The newborn nursery should have minimum clear floor area of 2.23 square meters per bassinet, exclusive of auxiliary work area.

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

1.17.1. Nurse station with dedicated documentation area.

1.17.2. Secured medication safety zone.

1.17.3. Nourishment area.

1.17.4. Clean workroom or clean supply room.

1.17.5. Soiled workroom or soiled holding room.

1.17.6. Equipment and supply storage.

1.17.7. Environmental services room.

1.17.8. Hand washing /scrub station.

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

1.17.10. Clean linen cabinet

1.17.11. Staff changing room / staff resting room

2. NEONATAL UNIT DESIGN

2.1. The NICU shall be designed as part of an overall safety program to protect the physical security of infants, parents, and staff and to minimize the risk of infant abduction.

2.2. All entries to the NICU shall be controlled. The family entrance and reception area shall be clearly identified.

2.3. The reception area shall permit visual observation and contact with all traffic entering the unit.

2.4. There should be efficient access to the unit from the labor and delivery area and emergency department.

2.5. The NICU should be located on the same floor as of Labor Suit and Operation Theatre.

2.6. Adequate ventilation and air exchange, with at least six (6) air changes per hour as per American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) requirement, shall be maintained in NICU. NICU should be kept at positive

pressure relative to the adjacent areas. The area temperature should be maintained at 21°C - 24°C and relative humidity 30 % to 60% and should be adjustable. High efficiency filters should be installed in the air handling system, with adequate facilities provided for maintenance, without introducing contamination to the delivery system or the area served.

2.7. NICU Nursery Rooms and Areas

2.7.1. In multiple-bed rooms, including ones with cubicles or fixed cubicle partitions, each patient care space shall contain a minimum clear floor area of 11.15 square meters per infant care bed excluding sinks and aisles.

2.7.2. Rooms intended for the use of a single infant shall contain a minimum clear floor area of 13.94 square meters excluding sinks and aisles.

2.7.3. In multiple bedrooms, there shall be an aisle adjacent to each infant care space with a minimum width of 1.22 meters.

2.7.4. When single-bed rooms or fixed cubicle partitions are used in the design, there shall be an adjacent aisle with a minimum clear width of 2.44 meters to permit the passage of equipment and personnel.

2.7.5. In multiple-bed rooms, a minimum clearance of 2.44 meters shall be provided between infant care beds.

2.7.6. In all bed areas, a minimum clearance of 1.22 meters shall be provided between the sides of infant care beds and any wall or other fixed obstruction.

2.7.7. A source of daylight shall be visible from infant care areas, either from each infant area itself or from an adjacent area. When a window(s) is provided, the following requirements shall be met:

a. Exterior windows in infant care areas shall be glazed with insulating glass to minimize unwarranted heat variations.

b. All daylight sources shall be equipped with shading devices.

2.7.8. Each patient care space shall be designed to allow visual privacy for the infant and family.

2.7.9. In multiple-bedroom, every bed position shall be within 6.10 meters of a hands-free hand-washing station.

2.7.10. Where an individual room concept is used, a hands-free hand-washing station shall be provided in each infant care room.

2.7.11. Each NICU bed should have the following:

a. Sixteen (16) electrical receptacles convenient to head of bed with one on each wall.

b. Three (3) station outlets for oxygen per infant care bed.

c. Three (3) station outlets for vacuum (suction) per infant care bed.

d. Three (3) station outlets for medical air systems per infant care bed.

2.7.12. NICU rooms providing all levels of care should have lights with a dimmer control.

2.7.13. Provision of suitable number of counters/desks for documentation or computers in NICU unit for Level II and above, at a ratio of 1:2 (one station/desk per 2 NICU beds) is recommended.

2.8. Special Patient Care Rooms

2.8.1. An Airborne infection isolation (AII) room shall be required with the following requirements:

a. The room shall be enclosed with provisions for observation of the infant from adjacent area(s) of the neonatal unit.

b. AII rooms in the neonatal unit shall comply with the requirements of AII room mentioned in the DHA Hospital Regulation except the requirements for air handling, separate toilet, bathtub, or shower.

c. AII rooms in the neonatal unit shall have a minimum clear floor area of 11.15 square meters.

d. Anteroom with hand washing station.

2.9. Support areas for the neonatal unit

2.9.1. Nurse station with documentation area

2.9.2. Multipurpose room(s)

2.9.3. Medications safety zone

2.9.4. Clean workroom or clean supply

2.9.5. Soiled workroom or soiled holding

2.9.6. Emergency equipment storage

2.9.7. Environmental services room

2.9.8. Diagnostic, treatment and service.

2.9.9. Infant feeding preparation facilities

a. Location: space for preparation and storage of formula and additives to human milk and formula shall be provided in the unit or other location away from the bedside.

b. The following functional spaces shall be provided when infant feedings are prepared onsite:

i. Anteroom area

ii. Preparation area

iii. Storage space

iv. Clean up area

c. Storage for human milk shall be provided in a designated space in the infant feeding preparation room or in designated spaces on the nursing unit.

d. Human milk storage container shall be labelled with at least two identifiers (e.g. baby's name and date of birth) and date/time of expression.

e. Surfaces in infant feeding preparation areas shall be non-absorbent, smooth and easily cleaned.

f. Wall construction, finish, and trim, including joints between the walls and the floors, shall be free of insect and rodent harbouring spaces.

g. Walls shall be non-absorbent, smooth, easily cleaned and light in colour.

2.9.10. Lactation support space: the space shall be provided for lactation support and consultation immediately accessible to the NICU.

a. A hand washing station and counter shall be provided in, next to, or directly accessible to the lactation support space.

b. Lactation support space shall have comfortable chairs for providing Kangaroo mother care.

c. Provisions shall be made for the following immediately accessible to the NICU:

i. Refrigeration and freezing

ii. Storage for pumps and attachments and educational materials

2.9.11. Waiting room for families and visitors

2.9.12. Area for counselling with the parents of newborns with major clinical issues may be provided. This area should have a desktop with a large screen and white board.

2.9.13. Support areas for staff which may include staff lounge, storage facilities, changing areas and toilets

STANDARD TWO: OBSTETRIC SERVICE REQUIREMENTS

3. ANTENATAL CARE

3.1. Obstetric service providers shall ensure that women are able to choose the most appropriate care through each phase of their maternity experience.

3.2. All pregnant women should be offered information indicative of all options available to them throughout the pregnancy, birth and early parenthood, including locally available services, screening tests, cost of services, types of antenatal and post-natal care and place of birth, such information should be based on the mother insurance policies coverage (when applicable) or patient preference.

3.3. Healthcare professionals providing obstetric services should be competent in recognizing, advising and referring women who would benefit from more specialist services.

3.4. To identify and determine the correct care provider for antenatal care, pregnancy risk assessment should be conducted (ideally at 10 weeks of gestation); high-risk pregnancies should be referred to a hospital setup.

3.5. 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 1** and **appendix 2**.

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

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

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

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

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

3.7. 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.

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

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

3.10. 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 3.**

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

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

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

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

3.11.4. The importance of carrying antenatal record card for all antenatal visits, please refer to **appendix 4.**

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

3.11.6. Early promotion and support of breastfeeding.

3.12. Antenatal care can be provided under supervision of the following healthcare professionals:

3.12.1. DHA licensed Consultant/Specialist Obstetrics and Gynecology.

3.12.2. DHA licensed Consultant/Specialist Family Medicine.

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

3.13. 6.13. To provide antenatal care the facility should have the following equipment:

3.13.1. Vital signs Monitor

3.13.2. Feotoscope

3.13.3. Electrocardiogram (ECG)

3.13.4. Cardiotocography (CTG) monitor

3.13.5. Ultrasonography

3.13.6. Access to laboratory testing.

3.13.7. Emergency crash cart with proper supplies and medication.

4. OBSTETRIC LEVELS OF CARE

4.1. Level I - Basic care

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

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

4.1.2. Detect, stabilize, and initiate management of unanticipated maternal–fetal 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.

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

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

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

4.1.6. 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.

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

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

4.1.9. 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.

4.1.10. The following equipment shall be available in each labor room:

a. A labor bed.

b. Vital signs monitor and stethoscope

c. CTG monitor.

d. Access to portable ultrasonography.

e. Intravenous solutions and infusion pumps.

f. Equipment for inhalation and regional anesthesia.

g. Emergency/crash cart with proper supplies and medication.

h. Instruments and equipment for normal or operative delivery (including vacuum and forceps).

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

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

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

a. Physicians:

i. DHA licensed Consultant/Specialist Obstetrician and Gynecologists OR

ii. 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, ratio should not exceed 2:1 (two GP to one consultant/specialist Obstetrics and Gynecology)

OR

iii. DHA licensed Consultant/Specialist Pediatrician or Neonatologist.

iv. DHA licensed Consultant/Specialist Anesthetist to provide labor analgesia and surgical anesthesia (when required).

b. 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 recommended

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

ii. Induction of labor at a ratio of 1:2.

iii. Patients in first stage of labor at a ratio of 1:2.

iv. Patients in second stage of labor at a ratio of 1:1.

c. 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 newborns.

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

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

iii. DHA licensed Clinical Dietitian with knowledge of maternal and newborn nutrition and parenteral/enteral nutrition management of at-risk newborns.

4.1.13. Health facilities providing Level I obstetric care shall provide a Level I. neonatal care services to newborn infants.

4.2. Level II - Specialty Care

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

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

4.2.2. Special equipment and care might be needed to accommodate the services needed for obese women and healthcare professionals should be trained to handle obese patients.

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

a. Physicians:

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

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

b. Nurses:

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

i. Maintaining at least two RN/RM for labor and delivery.

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

c. DHA licensed Physiotherapist.

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

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

4.3. Level III - Subspecialty Care

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

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

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

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

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

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

a. Physicians:

i. Consultant in Critical Care Medicine.

ii. 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, hematology, cardiology, nephrology, neurology, and neonatology.

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

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

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

4.3.5. Health facilities providing Level III obstetric care shall maintain Level III and/or Level IV neonatal care units.

STANDARD THREE: NEONATAL SERVICE REQUIREMENTS

5. NEONATAL LEVELS OF CARE

5.1. Level I - Basic care

Health facilities providing Level I neonatal care shall maintain the below capabilities:

5.1.1. Evaluate and provide routine postnatal care for full term newborn infants.

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

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

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

5.1.5. Perform neonatal resuscitation whenever needed.

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

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

5.1.8. The units shall maintain the following healthcare professionals:

a. NICU in charge physician:

i. DHA licensed Consultant/Specialist Neonatologist.

OR

ii. DHA licensed Consultant Pediatrician with last 3 years' experience in Neonatology from appropriate hospital setting providing a similar or higher level of neonatal care.

OR

iii. DHA licensed Specialist Pediatrician with last 5 years' experience in Neonatology from appropriate hospital setting providing a similar or higher level of neonatal care.

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

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

i. Licensed Specialist Pediatrician with last 2 years' experience in neonatology

OR

ii. Licensed GP with master degree in pediatric with approved specialty degree equivalent to Tier 3 or more as per the PQR with last 2 years' experience in pediatric and neonatology.

c. Nurses:

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

OR

ii. A DHA licensed neonatal nurse.

iii. 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.

5.2. Level II - Specialty Care

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

5.2.1. Provide care for stable or moderately ill newborn 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 may arise as a result of relatively uncomplicated preterm labor or preterm rupture of membranes.

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

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

5.2.4. Provide care for infants convalescing after intensive care.

5.2.5. Stabilize infants born before 32 gestational age and weighting less than 1500 gm until transfer to a neonatal intensive care unit.

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

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

a. NICU in charge physician:

i. DHA licensed Consultant/Specialist Neonatologist.

OR

ii. DHA licensed Consultant Pediatrician with last 7 years' experience in neonatology from appropriate hospital setting providing a similar or higher level of neonatal care, AND shall pass DHA's assessment to add the neonatology scope within his/her privilege.

b. Physician coverage in Neonatal Unit available in the hospital on 24/7 basis: (similar to Level I)

c. Nurses:

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

d. Other healthcare professionals as Respiratory Therapists (optional) and DHA licensed Clinical Dietitian with knowledge of newborn nutrition.

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

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

b. The following range of equipment:

i. Neonatal intensive care incubators
ii. Neonatal ventilator
iii. Syringe/infusion pumps (0.1 ml/hour)
iv. Neonatal resuscitator along with emergency/crash cart including proper supplies and medication.
v. Blood gas analyzer

vi. Phototherapy units

vii. Portable x-rays

viii. Portable ultrasound scanning

ix. Breast pump machine

x. Oxygen analyser/pulse oximeter

xi. Umbilical arterial and venous catheter

xii. Neonatal monitors to measure heart rate, respiratory rate, blood pressure, transcutaneous or intra-arterial oxygen tension, oxygen saturation and ambient oxygen

xiii. Medications for infant

xiv. Portable incubator with ventilator.

Note: If a paediatric 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.

c. 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.

5.3. Level III – Sub specialty intensive care (NICUs)

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

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

5.3.2. 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.

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

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

5.3.5. Perform advanced imaging, with interpretation on an urgent basis, including computed tomography, MRI, and ECG.

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

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

5.3.8. Hospitals providing level III services shall maintain the following healthcare professionals:

a. Physicians

i. DHA licensed Consultant Neonatologist (NICU in charge and head of the unit|)

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

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

- DHA licensed Specialist Pediatrician with last 3 years' experience in neonatology

OR

- Licensed GP with degree in pediatric and last 2 years' experience in neonatology.

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

b. Nurses:

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

5.4. Level IV services

Level IV neonatal care services shall have the same capabilities and healthcare professionals of level III with additional capabilities and considerable experience in the care of the most complex and critically ill newborns. Level IV services shall:

5.4.1. Be located in a hospital capable of performing cardiac diagnostics and full cardiac surgeries including congenital cardiac malformations that require cardiopulmonary bypass with or without extracorporeal membrane oxygenation (ECMO) and neurological deficits and surgeries.

5.4.2. Maintain an access to full range of pediatric Medical Subspecialists, Pediatric Surgical Subspecialists, and Anesthesiologists with experience in pediatrics/neonates on 24/7 basis.

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

Note: For the different levels of care (obstetric and neonatal) refer to **appendix 6.**

6. NEONATAL ASSESSMENT AND ADMISSION

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

6.2. Newborn babies shall be initially examined and fully assessed for normal and dysmorphic features, using Apgar score and Ballard score, please refer to **appendices 7-9.**

6.3. Matters such as newborn 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 newborn condition.

6.4. Discharge planning which may include:

6.4.1. Infant follow-up clinic appointment

6.4.2. Hearing screening test prior to discharge

6.4.3. Lactation clinic appointment

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

6.4.5. Car seat safety measures

STANDARD FOUR: GENERAL SERVICE REQUIREMENTS

7. INFORMED CONSENT

7.1. As per DHA's Informed consent guidelines, the health facility should identify treatments and procedures that requires obtaining specific informed consent from patients/carers regarding obstetric and neonatal procedures.

8. INFECTION CONTROL

8.1. 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.

8.1.1. 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 newborn.

8.1.2. 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.

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

a. Hand hygiene.

b. Appropriate use of Personal Protective Equipment (PPE)

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

d. Equipment Reprocessing

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

f. Readmission from community or transfer from another hospital.

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

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

i. Transfer In –newborns 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 newborn on additional precautions until results are known, dependent on the assessed level of risk (e.g., outbreak in the transferring unit, maternal colonization risk).

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

8.3. 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.

9. FALL MANAGEMENT

9.1. Health facilities providing obstetric and neonatal care shall develop and implement a policy for falls management. Both women and neonates shall be assessed for risk of falls based on the following events:

9.1.1. On admission and transfer to another unit.

9.1.2. Following a change of health status.

9.1.3. After a fall.

9.2. Appropriate falls reduction strategies shall be implemented by the health facilities especially to patients identified as “at Risk” of falling.

9.3. Falls prevention information shall be provided to staff, patients and patient's family/patient carer, including appropriate educational material for carrying a baby.

9.4. Falls risk shall be recorded as part of the inpatient shift data record, and an incident form shall be completed for all patient falls with appropriate documentation in the patient’s health record.

9.5. Fall information relating to a patients “falls risk” and associated fall prevention strategies shall be included in any transfer/discharge documentation.

10. BLOOD MANAGEMENT

10.1. 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.

10.2. 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.

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

11. MEDICATION MANAGEMENT

11.1. All health facilities shall develop and implement policies and procedures for medication management based on five (5) simple principles:

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

11.1.2. Suitable choose of medications

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

11.1.4. Allergies and sensitivities information

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

11.2. All healthcare professionals should understand and abide to the Good Pharmaceutical Storage and Distribution Practices (GS&DP), related rules and regulations.

11.3. Educating patients/carers on the management of their own health including fully informing them about their medication, anticipated effects, side effects, contraindications, self-administration, treatment plan and follow-up.

11.4. For further details, please refer to Dubai Pharmacy and Pharmaceutical Practices Regulation.

12. NUTRITIONAL NEEDS

12.1. 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:

12.1.1. The importance of the breastfeeding.

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

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

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

12.1.5. The preparation (including the required equipment and preparation area), safe storage and handling of the newborn formula.

12.2. 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.

12.3. 8.19. All health facilities shall provide lactation support training programs for all obstetric and neonatal units' staff related to newborn babies feeding and nutritional needs :

12.3.1. The nutritional and physiological aspects of breastfeeding.

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

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

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

12.3.5. Safe techniques for breastmilk storage.

12.3.6. Cultural values related to breastfeeding.

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

12.4. All health facilities should offer educational programs for all women during antenatal or postnatal care related to newborn babies feeding and nutritional needs.

12.5. 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.

13. HEALTH RECORD

13.1. As per DHA health record guidelines, a legible, complete, comprehensive, timely and accurate health record shall be maintained for each patient.

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

14. SECURITY

14.1. Neonatal identification

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

14.1.2. 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 newborns babies.

14.1.3. The following patient identifier should be recorded on the identification band/ card:

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

i. In case of twins or multiple babies, an identifier should be, e.g. Baby A of Sara, Baby B of Sara, etc.

b. File number for mother and baby.

c. Gender.

d. Date and Time of birth.

e. Birth weight.

f. Head circumference.

g. Length.

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

14.3. To minimize the risk of infant abduction all areas including newborn nurseries, intrapartum and postnatal should be controlled and part of hospital safety program.

15. TRANSFER

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

15.2. The policy should include:

15.2.1. Transfer criteria

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

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

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

a. Portable suction

b. Portable ECG

c. Oxygen and breathing equipment

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

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

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

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

16. DISCHARGE AND FOLLOW UP

16.1. Discharge plan shall be developed with the participation of relevant healthcare professionals in comprehensive writing, consistent with medical discharge orders and identified patient needs.

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

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

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

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

16.3.3. Urine and stool passage.

16.3.4. 8.33.4. Baby's weight.

16.4. Neonatal screening tests shall be performed for the baby as per UAE applicable Federal Laws and local regulations, this include but not limited to:

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

16.4.2. Neonatal Hearing Screening

16.4.3. Critical Congenital Heart Disease (CCHD) screen.

For further details, please refer to **appendix 10**

16.5. Neonatal circumcision should be offered and arranged.

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

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

16.6.2. Follow-up for the mother with the Family Medicine /Obstetrics and Gynaecology physician.

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

16.7. 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

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

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

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

16.11. Infant follow up clinic appointment for preterm babies.

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

17. MANAGEMENT OF ABORTION, STILLBIRTH AND NEONATAL DEATH

17.1. In case of abortion, the health facility shall abide to The Decree of the Federal Law no. (4) Of 2016 Concerning the Medical Liability, which underline and clarify in article (16) the conditions and indications for abortion that may be performed.

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

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

17.4. 8.46. 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.

17.5. 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 may be accessed via http: //eservices.dha.gov.ae/BDN/admin CG/ca main.aspx

STANDARD FIVE: KEY PERFORMANCE INDICATORS

17.6. Health facilities shall implement a data collection system for monitoring and auditing the outcome of obstetric and neonatal care, such data can be used as tool that facilitates the review and development of the service performance.

17.7. All Health facilities providing intrapartum service shall submit to DHA data related to all live and still births, based on nationality, sex and age.

17.8. Health facilities should specify set of clinical indicators and data collection requirements for obstetric and neonatal services with aim to measure and improve the performance of health facilities providing obstetric and neonatology services.

REFERENCES

1. ACOG (2015). Levels of Maternal Care. Available at: http://www.acog.org/Resources-And-Publications/Obstetric-Care-Consensus-Series/Levels-of-Maternal-Care. [Accessed 20 May 2016].
2. American Academy of Pediatrics (2012). *Policy Statement. Levels of Neonatal Care.* Pediatrics. 130:3.587-597.
3. American Congress of Obstetricians and Gynecologists (2013). Ob-Gyns Redefine Meaning of "Term Pregnancy". Available at: http://www.acog.org/About-ACOG/News-Room/News-Releases/2013/Ob-Gyns-Redefine-Meaning-of-Term-Pregnancy. [Accessed 26 June 2017]
4. Baby's First Test (2015). Critical Congenital Heart Disease. Available at: http://www.babysfirsttest.org/newborn-screening/conditions/critical-congenital-heart-disease-cchd#sthash.7vQWjDfW.dpf. [Accessed 26 June 2017]
5. British Association of Perinatal Medicine (2001). Standards for Hospitals Providing Neonatal Intensive and High Dependency Care (2nd Edition) and Categories of Babies requiring Neonatal Care.
6. Department of Health (2009). *Toolkit for High-Quality Neonatal Services*. Available at: http://www.dh.gov.uk/publications. [Accessed 20 March 2016].
7. DHA (2015). Ante natal care protocols. *General Circular pursuant to the Health Insurance Law (No 11 of 2013) of the Emirate of Dubai General Circular Number 1 of 2015 (GC*

01/2015), [Online]. 1, 11. Available at: http://www.isahd.ae/content/docs/GC%2001-2015%20Antenatal%20care%20protocols.pdf [Accessed 16 March 2016].

8. Facility Guidelines Institute (2014). Guidelines for design and construction of hospitals and outpatient facilities.
9. Health Authority-Abu Dhabi (2012). Policy for the Health Care Facilities, Providing Maternity Services (Labor and delivery).
10. Health Sydney local health district (2013). *Women and Babies: Infection Prevention and Control in NICU.* Available at: http://www.slhd.nsw.gov.au/rpa/neonatal%5Ccontent/pdf/guidelines/InfectionControlGuidelineMar2015.pdf. [Accessed 13 March 2016].
11. King Edward Memorial Hospital (2015). Deceased baby: care and management - women and newborn health service. Available at http://www.kemh.health.wa.gov.au/development/manuals/O&G_guidelines/sectiona/8/a8.5.pdf [Accessed 13 March 2016].
12. LAWriter® Ohio Laws and Rules (2012). *Maternity Units and homes Chapter 3701-7*. Available at: http://codes.ohio.gov/oac/3701-7. [Accessed 18 April 2016].
13. New Ballard Score Maturational Assessment of Gestational Age. Available at: http://www.ballardscore.com [Accessed 17 May 2016].
14. Report of the Seventh Consensus Conference on Newborn ICU Design (2007). *Recommended Standards for Newborn ICU Design*. Available at:

https://www3.nd.edu/~nicudes/Recommended%20Standards%207%20final%20may%2015.pdf [Accessed 1 March 2016].

15. The UAE Cabinet Resolution No. 28 regarding blood transfusion system among facilities and professionals. available at: https://www.dha.gov.ae/en/HealthRegulation/Pages/FederalLaws.aspx [Accessed 8 June 2016].
16. WHO (2013). Recommendations on Postnatal care of the mother and newborn.

APPENDICIES

APPENDIX 1 - 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 gynaecologist 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 gynaecologist 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/Labors /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/Labors /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 hemorrhage, (aware for delivery)	5
Previous baby with structural abnormality	10
Medical History	
Cardiac Disease	10

Fetal loss after 22 weeks	10
Placental abruption	10
Preterm labor 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	
Anesthetic 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
TOTAL SCORE	

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

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
Anemia <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 week 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 labor	8
Intrauterine fetal death	4
Enter the risk score on the follow up notes	

APPENDIX 2 - 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, hemolytic 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 labor <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 fetal compromise – severe oligohydramnios

3.7 Absent/reverse diastolic flow on umbilical Doppler

APPENDIX 3 - 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 hemolytic 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 4 - ANTENATAL CARD

Health No.	الرقم الصحي
Center	مركز

Mother's information:	بيانات خاصة بالأم:
Name	الاسم
Age	العمر
Occupation	المهني
Nationality	الجنسية

Husband's information:	بيانات خاصة بالزوج:
Name	الاسم
Age	العمر
Occupation	المهني
Nationality	الجنسية

Address	العنوان
City	المدينة
P.O. Box	صندوق البريد
Tel. No. off.	رقم هاتف العمل
Resi.	المنزل

Remarks	الملاحظات

Family History

○ Consang Yes □ No □

	Yes	No
○Multiple Pregnancy		
○Congenital Anomalies		
○Diabetes Mellitus		
○Hypertension		
○Other – Specify		

Personal & Medical History

	Yes	No
Resp. Diseases		
Cardio Vas. Disease		
Blood Disease		
Hypertension		
Diabetes Mellitus		
Hist. of Blood Trans.		
Use of any Medications		
Surgery		

	Yes	No
Allergies		
Smoking		
Others		

Previous Obstetric History

No.	Date of Birth	Place of Birth	Dur. Of Preg.	Comp. of Preg.	Mode of Delivery	Complication	Child			
							B. Feeding	Sex	Wt.	Remarks

Obstetric & Menstrual History		Investigations	
Garvida.....	Para.....	ABO/Rh Typing.....	Antibodies.....
L.M.P.....	E.D.D.(Date).....	Hb.....	Rubella.....
Cycle.....	E.D.D.(USS).....	Platelets.....	VDRL.....
History of contraception (Specify)		Thalassemia/Sickle Cell.....	HbsAg.....
Other.....		GTT/GCT.....	HIV.....
		Urine Analysis.....	
		Other.....	

General Exam.	
• Weight	• Height
• Teeth	• Breasts
• CVS	• RS
• ABD	• Limbs
• Other	

Ultrasound Scanning Result		
Date of USS	1	2
Details		

Obstetric Exam and Follow-up

Date	Dur. Of Preg. Weeks	Height Fundus Weeks	Pres & Position	Rel. of P.P to BRIM	F.H.S	Wt Kg.	Oedema	B.P.	Urine for		Hb gms%	Remarks	Sig.	Next Visit
									Sugar	Alb.				

Special Remarks: **ملاحظات خاصة:**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

CONFINEMENT AND PUERPERIUM

LABOUR NOTES: .....

.....

PUERPERIUM: .....

.....

PLACE:.....

DATE:.....

CONDITION AT DISCHARGE

MOTHERS:..... DATE:.....

BP.....

UTERUS.....

HB.....

BREASTS .....

PERINIUM .....

URINE.....

Newborn

Birth WT.....

APGAR SCOR.....

ABO/Rh Feeding.....

Special Care.....

SEX.....

WT. AT Discharge .....

Length .....

Head Circumference .....

Congenital Malformations .....

POST NATAL FOLLOW-UP

Date	Wt. Kg.	BP	Urine Alb and Sugar	HP	Breasts	ABD	Pelvic Exam	Remarks

SPECIAL NOTES AND RECOMMENDATIONS FOR FUTURE PREGNANCIES

APPENDIX 5 – W.H.O SAFE CHILDBIRTH IMPLEMENTATION GUIDE

Medications/injections/drips

Crash Cart with all Emergency Drugs

IV Fluids

Dinoprostone (Prostin E2) Tablet
Dinoprostone (Propess) } For Induction of Labor

Injectable Oxytocin → Augmentation of Labor 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 - OBSTETRIC AND NEONATAL LEVELS OF CARE CAPABILITIES, AND HEALTHCARE PROFESSIONALS

Level of care	Capabilities	Healthcare professionals
Level I – Basic care (Obstetric)	• 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–fetal 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 fetal risks and benefits, and with the provision of emergency care.	• 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 Anesthetist. • Registered nurse (RN) or registered midwife (RM).with experience in obstetric care and holding an active Neonatal Resuscitation Program (NRP). • Clinical Dietitian. • Physiotherapist (optional).
Level I- Basic care (Well newborn nursery)	• Provide neonatal resuscitation at every delivery • Evaluate and provide postnatal care to stable term newborn infants • Stabilize and provide care for infants born 35–37 gestational age who remain physiologically stable. • Stabilize newborn 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 • Registered nurse with experience in neonatology not less than 2 years (or neonatal nurse).
Level of care	**Capabilities**	**Healthcare professionals**
Level II - Specialty Care **(Obstetric)**	Level I capabilities plus: • Provide care to high-risk pregnancies and for pregnant women at thirty two (32) gestational weeks and above, unless an emergency medical condition exists.	• Consultant/Specialist Obstetrician and Gynecologists. • Consultant/Specialist Pediatrician or Neonatologist • Consultant/Specialist Anesthetist. • Prompt and readily available DHA licensed Medical and Surgical specialties and Maternal and Fetal Medicine Subspecialists either by onsite consultation or by telemedicine, if needed. • Registered nurse (RN) or registered midwife (RM).with experience in obstetric care and holding an active Neonatal Resuscitation Program (NRP). • Physiotherapist. • Social worker (optional).
Level II– Specialty care **(Special care nursery)**	Level I capabilities plus: • Provide care for infants born ≥32 week's gestation and weighing ≥1500 g who have physiologic immaturity OR who are moderately ill with problems that are expected to resolve rapidly and	• Consultant/Specialist Neonatologist **OR** • Consultant Pediatrician with last 7 years' experience in neonatology.

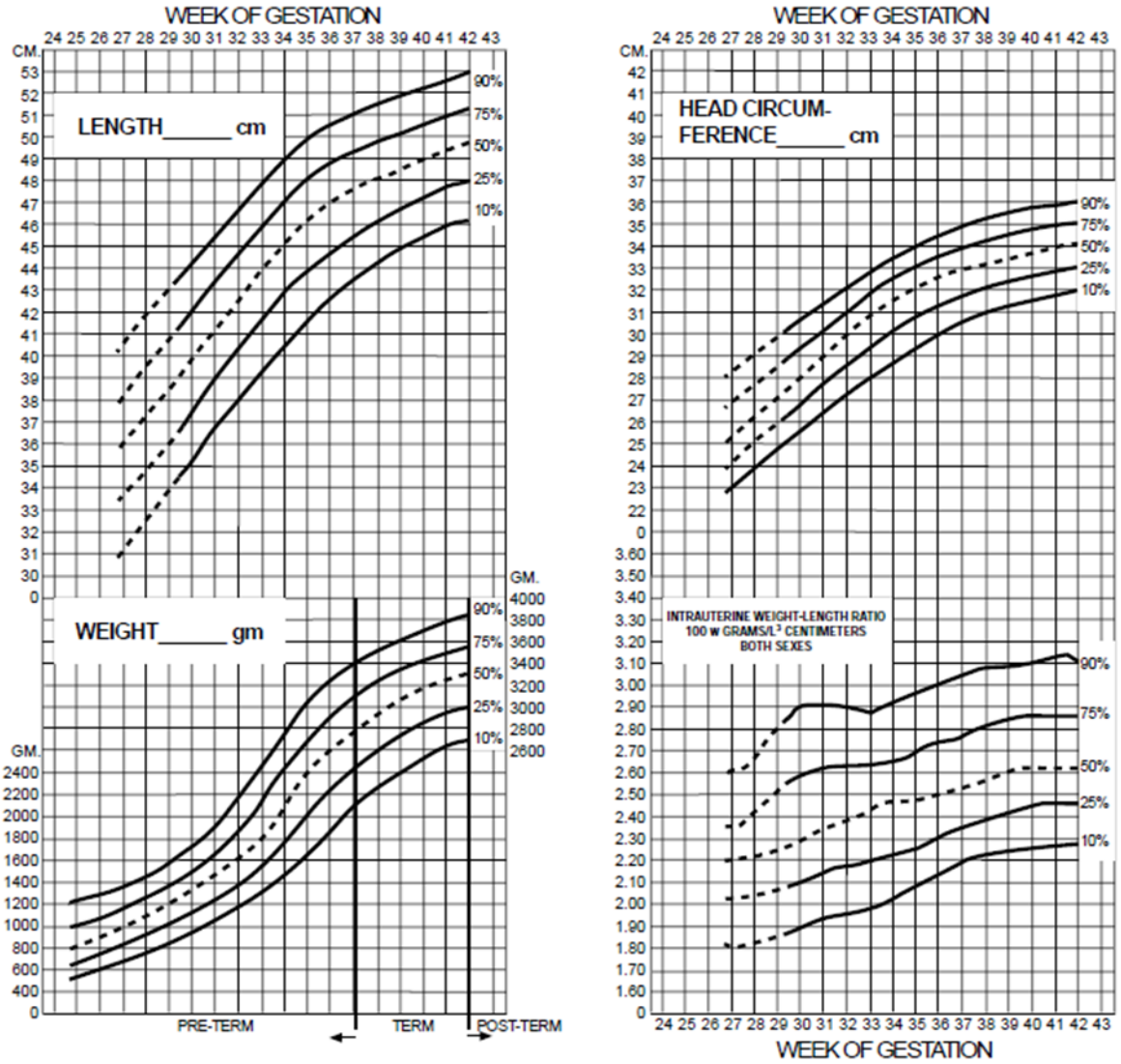
	are not anticipated to need subspecialty services on an urgent basis. • Provide care for infants convalescing after intensive care. • Provide mechanical ventilation for brief duration (<24 hours) OR continuous positive airway pressure or both. • Stabilize infants born before 32 weeks gestation and weighing less than 1500 g until transfer to a neonatal intensive care facility.	• Physician coverage in Neonatal Unit available in the hospital on 24/7 basis: 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 2 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 of care	**Capabilities**	**Healthcare professionals**
Level III - Subspecialty Care **(Obstetric)**	Level II capabilities plus: • Provide care to more complex obstetric and fetal cases as well as pregnant women at less than thirty two (32) gestational weeks. • Have medical and surgical Intensive Care Units (ICUs). • Provide ventilation and ability to stabilize the patient in labor and delivery until transferred safely to ICU when needed.	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 critical care, general surgery, neurosurgery, cardiac surgery, infectious disease, hematology, cardiology, nephrology, neurology, and neonatology.

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, anesthesiologists, and ophthalmologists • Provide a full range of respiratory support that may include conventional and/or high-frequency ventilation and inhaled nitric oxide • Perform advanced imaging, with interpretation on an urgent basis, including computed tomography, MRI, and echocardiography	• 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* • Anesthesiologists* • Ophthalmologists* *At the site or at a closely related hospital by prearranged consultative agreement. • Respiratory Therapists (optional)
Level of care	**Capabilities**	**Healthcare professionals**
Level-IV (NICU)	Level III capabilities plus: • Capability to perform congenital cardiac malformations that require cardiopulmonary bypass with or without extracorporeal membrane oxygenation (ECMO).	• Level III healthcare professionals plus: • Pediatric surgical subspecialists

APPENDIX 7 - CLASSIFICATION OF NEWBORNS (adapted from Mead Johnson Nutritionals 1999)

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

Side 2



	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 8 - NEWBORN MATURITY RATING AND CLASSIFICATION (adapted from Mead Johnson Nutritionals 1999)

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; transluoent	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 _____ Hour _____ am / pm	Date _____ Hour _____ am / 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 Newborn'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 fetal 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 cesarean section or any unusual obstetrical complications, including hydramnios, abruption placentae, placenta previa, or abnormal presentation.
   h. Significant malformation or suspicion of malformation.

i. Anemia or blood group incompatibility.

j. Severe maternal emotional problems, such as hyperemesis gravidarum.

k. Serious accidents or general anesthesia during pregnancy.

3. General Observation

a. Level of consciousness (breathing or crying)

b. General Appearance (resting posture, tone, spontaneous activity, respiratory efforts).

c. Skin (color, 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

1. Appearance, shape, presence of moulding

2. Trauma of the skull
3. Head Circumference
4. Fontanels.

b. Eyes

1. Pupil response to light
2. Corneal Opacities
3. Red Reflex
4. 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

1. Webbing
2. Thyroid gland size
3. 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 maneuvers.

15. Skin for abnormalities, which often includes Woods light examination of fluorescent hypo pigmented areas.
16. Central Nervous
    a. Tone, Behavior, Movements and Posture
    b. Newborn reflexes:
        1. Sucking and swallowing reflex
        2. Rooting reflex
        3. Tonic neck reflex
        4. Palmar grasp reflex
        5. Moro Reflex
        6. Babinski reflex
        7. Stepping reflex
    c. Tendon reflexes.

APPENDIX 10 - HEEL PRICK TESTING

The newborn national screening program is part of the federal strategy since 1995. The program aims to protect children from genetic diseases. Early screening and treatment can save the lives of newborn babies and decrease the mortality rates.

The laboratory-screening specimen are collected (48-72 hours after birth) at the birthing hospital and sent to a clinical laboratory for analysis. In case of any positive cases, the hospital should contact the parents for follow up.

Disorders screened by the National Neonatal Screening Program

1. Congenital Hypothyroidism
2. Congenital Adrenal Hyperplasia
3. Sickle Cell Anemia
    a. There are 3 common types of sickle Cell Diseases:
        - Hemoglobin SS or sickle cell anemia
        - Hemoglobin SC disease
        - Hemoglobin Sickle Beta- thalassemia
4. Biotinidase Deficiency
5. Tandem mass spectrometry (MS/MS): 12 disorders
    - Amino Acid Disorders: e.g. Phenylketonuria (PKU), Maple Syrup Disease (MSUD),Citrullinemia Type I (CIT I), Argininosuccinic acidemia (ASA)
    - Organic Acid Disorders: e.g. Isovaleric acidemia (IVA), 3-Methylcrotonyl-CoA carboxylase def.(3MCC), 3-OH 3-CH3 glutaric aciduria (HMG), Beta-ketothiolase deficiency (BKT), Glutaric acidemia type I (GA I), Propionic acidemia (PA), Methylmalonic acidemia (MMA)

      Fatty Acid Oxidation Disorders: e.g. Med.-chain acyl-CoA dehydrogenase def. (MCAD)