



الهيئة السعودية للتخصصات الصحية  
Saudi Commission for Health Specialties

# Saudi Neonatal Perinatal Medicine Fellowship Curriculum



سَبَّحَ لِلَّهِ مَا فِي السَّمَاوَاتِ وَالْأَرْضِ

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## INTRODUCTION

### Foreword

This updated curriculum adopts the CanMEDS framework, an innovative, competency-based framework that describes physicians' core knowledge, skills, and attitudes. This curriculum is intended to provide fellows and faculty a broad framework, which enables them to focus on teaching and learning as well as clinical experience and professional development during the fellowship training program. This curriculum does not intend to be the sole resource for what is to be taught and learned during the fellowship training. Fellows are expected to acquire knowledge and skills and develop appropriate attitudes and behavior throughout their fellowship program and to take personal responsibility for their learning. They must learn from every patient encounter, whether or not that particular condition or disease is mentioned in this curriculum.

This curriculum is part of SCFHS' strategic plan to review and update its training curricula. It was developed and reviewed by the Scientific Council of Saudi Neonatal Perinatal Fellowship Program.

The Saudi Commission for Health Specialties is committed to fully supporting the implementation of this curriculum by allocating necessary resources, providing faculty development, and establishing a monitoring system. Further reinforcements and continuous quality improvement will be achieved through feedback from fellows, trainers, and program directors. The Central Accreditation Committee and the Neonatal Perinatal Fellowship Program Scientific Board will also perform regular site visits.

### Context

While health services in Saudi Arabia originally functioned with only limited resources, today there are modern specialized hospitals, medical centers, and medical cities. The rapid growth of health services has necessitated a planned development of manpower to run such services. Saudi Arabia, therefore, has invested in overseas scholarships and local training, established the Saudi Commission for Health Specialties, and implemented structured training programs.

The neonate mortality rate (fatalities/1,000 live birth) in the kingdom is 8/1000 and the maternal mortality rate (fatalities/100,000) is equal to 12/100,000, according to a 2016 WHO report. The top three causes of mortality in for neonates include premature birth, neonatal sepsis, and congenital anomalies.

Saudi Arabia culture is unique; there are a high number of first-degree consanguinity marriages, which leads to a high rate of inherited disorders. Most of these cases present in the neonatal period and require specialized treatment. The large geographic area of the country is another distinctive variable; health services, both for general patients and pregnant mothers, varies drastically between different regions.

Neonatal Perinatal Medicine is a subspecialty of Pediatrics and is concerned with maintaining the health and long-term development of fetuses, neonates, and infants. A neonatal subspecialist (neonatologist) is a pediatrician who has undergone additional training to develop the necessary knowledge, skills, and attitudes to help prevent, diagnose, and manage disorders in this patient population.



The Saudi Neonatal Perinatal Fellowship Program was established in January 2004, one of SCFHS' first fellowship programs. Since then, the program has expanded; graduates are working in many centers across the kingdom. There are currently 19 accredited centers for Neonatal Perinatal Fellowship Program training across the kingdom.

Over the last five years (2013–2017), 104 candidates were accepted to the program. The Saudi Neonatal Perinatal Fellowship Program has a record of training leaders in neonatology and its graduates currently hold leadership positions such as medical director, division chief, and program director. Fellows gain broad exposure to neonate health care and substantial experience in the management of diverse pathologic conditions. This includes experience in managing prematurity, congenital heart disease, surgical cases, infants of diabetic mothers, metabolic disease, and others.

The fellowship is a two-year program that focuses on clinical excellence and scholarship. The fellows will gain a comprehensive clinical experience in Neonatal Perinatal medicine at one of the kingdom's 19 training centers. Each trainee is able to tailor their scholarly activity and research experience to their individual interests and is mentored by highly engaged and experienced faculty.

Trainees gain broad exposure to clinical neonatology through serial rotations in the neonatal intensive care unit (NICU), Level II NICU and normal nursery, the labor and delivery suite, high risk maternal fetal medicine clinics and departments, and development neonatal follow up clinics. In addition, trainees can choose two elective rotations during their training period.

Antenatal counseling, ethical issues, and discussions of the costs and benefits of diagnostic tests, procedures, and therapies are integral parts of the fellowship program. The training provides educational experiences that prepare fellows to be competent neonatologists able to provide comprehensive, coordinated care to a broad range of neonatal patients. Fellows are given the opportunity to work with other members of the health care team in the NICU to become proficient in the field and bring systematic improvement to the processes of patient care. Throughout the two years of the training, emphasis is placed on enhancing fellows' decision making, communication, and interpersonal skills.

The Neonatal Perinatal Fellowship Program is also committed to teaching fellows research skills, and all trainees have dedicated time to engage in scientific research. Trainees are allowed to do three months of research during their fellowship and encouraged to present their work at national and international conferences. The Neonatal Perinatal Fellowship Program is among the first SCFHS fellowship programs to integrate research into the curriculum and to mandate research presentations before taking final exams.

The fact that in the Kingdom of Saudi Arabia (KSA), Islamic culture and regulations govern all medical decisions often creates ethical dilemmas for our fellows when dealing with difficult neonatal cases, especially in do not resuscitate (DNR) and palliative care situations. This is a challenge for our fellows, and we make sure to include these topics in daily NICU rounds and in the educational curriculum.

The purpose of this curriculum is to define the process of training and the competencies required for the award of the Saudi Neonatal Perinatal Medicine Fellowship Certificate.

Post training, the Neonatal Perinatal Medicine Fellow will have the competencies required to be able to work as a consultant within the National Health Service and will be in a position to develop further interest within Neonatal Perinatal Medicine.

This curriculum will be reviewed every three years or at any time as necessary.

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## PROGRAM STRUCTURE

The Neonatal Perinatal Fellowship Program consists of two years of well-structured, full-time, supervised training. All candidates must be SCFHS certified in pediatrics or another approved equivalent in order to be eligible for the fellowship.

### Required Rotations in Each Year

The rotations are based on a block system rather than months. Each block consists of four weeks.

Rotations		Blocks	F1	F2
Neonatal Intensive Care (NICU level- III)	NICU III	9	6	3
Neonatal Intensive Care/Outside rotation	Outside Rotation	6	2	4
Intermediate Care Unit (ICN)	ICN	2	1	1
Neonatal follow up clinic	NFC	1	1	0
Feto-maternal rotation	FM	1	0	1
Research rotation	RES	3	1	2
Elective	EL	2	1	1
Holiday	HOL	2	1	1
<b>TOTAL</b>		<b>26</b>	<b>13</b>	<b>13</b>

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## GENERAL FELLOWSHIP GUIDELINES

1. The duration of the fellowship is two years (F1 and F2)
2. Training is a full-time commitment. The fellow shall be enrolled in full-time, continuous training for the entire duration of program.
3. During those two years, the fellow will have different rotations in and out of the NICU.
4. The fellow will be under close academic and clinical supervision from the neonatologist on duty.
5. The fellow's performance will be evaluated every 3 months maximum during the two years of the fellowship.
6. Fellow should hold valid Neonatal Resuscitation Program certificate (NRP) (provider/instructor) during the 2 years of training and as a prerequisite to sit for first year and final year exam.

## SPECIFIC REGULATIONS

1. The six blocks of outside NICU rotations must be done outside the fellow training center in SCFHS-approved Neonatal Perinatal Fellowship Program training center.
2. SCFHS local training program committee will be responsible for coordinating fellows' outside rotations and will inform each program director in the training centers.
3. The neonatal follow up clinic rotation must be done in a well-established clinic supervised by a neonatologist.
4. Elective periods could be spent in any of the following rotations:
  - Neonatal ultrasonography
  - Genetics
  - Neonatal anesthesia
  - Pediatric cardiology
  - Pediatric intensive care unit (PICU)
  - Neonatal respiratory therapy

Other rotations need approval from the program director and/or local committee.

## REQUIREMENTS FOR SCFHS CERTIFICATION

1. SCFHS certification in pediatrics
2. Successful completion of a two-year SCFHS accredited program in Neonatal Perinatal Fellowship Program
3. Completion of a scholarly research project relevant to Neonatal Perinatal medicine
4. Successful completion of the certification examinations

The two-year program outlined above is to be regarded as the minimum training requirement. The program director may require a fellow to receive additional training to ensure that clinical competences has been achieved.

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## ADMISSION REQUIREMENTS

The candidate must fulfill the following requirements as per SCFHS Admission Requirements for Postgraduate Training Programs ([scfhs.org.sa](http://scfhs.org.sa)) and the following additional requirements:

1. "Saudi Board of Pediatric" certificate or equivalent from a recognized institute.
2. An admission interview
3. Three recommendation letters confirming a candidate's suitability for training in Neonatal Perinatal Fellowship Program
4. The provision of a letter from a sponsoring organization giving approval for the candidate to undertake full-time training for the entire duration of the program (two years)
5. The registration as a senior registrar in pediatrics at the Saudi Commission for Health Specialties.
6. Valid Neonatal Resuscitation Program certificate (NRP)
7. For Non Saudi, in-addition to the above, the following will applied:
  - Registration as a senior registrar at SCFHS
  - Has an experience working currently in the NICU with the following specification:
    - Presence of 2 Neonatal consultants according to SCFHS
    - The unit has not less than 10 beds for level III NICU
    - Total number of delivery not less than 1500 / year
8. After the interview, each accepted candidate will receive a preliminary acceptance to finish the required documents before January; otherwise, the application will be on the waiting list.
9. Each applicant will have 60 days only to finish the sponsorship documents, from the start of the program.

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## DIFFERENCES BETWEEN THE PREVIOUS AND CURRENT CURRICULA

1. Philosophical orientations
  - The new curriculum is competency-based
  - There is now a clearer demarcation of what should be achieved at each stage of training
  - The new curriculum focuses on independent learning within a formal structure
2. Expanded range of competencies
  - There is now a balanced representation of knowledge, skills, and professionalism
  - The new curriculum incorporates new knowledge and skills
3. Block system of rotations (4 weeks) has been introduced
4. Educational material has been restructured
5. Promotion criteria's are now reformulated

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## OUTCOMES AND COMPETENCIES

### Rationale

The Neonatal Perinatal Fellowship Program aims to provide high-level, state-of-the-art clinical training, education, and research in neonatology and to graduate qualified and safe neonatologists in accordance with international educational standards.

### Overall Goal

To provide fellows with educational experience; to teach necessary knowledge, skills, and attitudes; and to outline general and specific training criteria in order to guide fellows to successful completion of the program. Fellows should always carry out appropriate patient care while maintaining a high degree of professionalism and ethical standards.

After accomplishing all training requirements, the fellow is expected to be a competent subspecialist in Neonatal Perinatal medicine and capable of assuming a consultant's role.

Our new program and specific objectives for each rotation have been shaped by the CanMEDS framework.

### Objectives

- To train and graduate competent paediatricians in the field of Neonatal Perinatal medicine
- To provide an educational environment that promotes a higher standard of health service in neonatal intensive care units
- To promote research in the field of Neonatal Perinatal medicine

## LEARNING OUTCOMES

Successful fellows will acquire a broad understanding of the principles, philosophy, core knowledge, skills, and attitudes of neonatology. By the end of their training, they should be able to have a wide range of skills, for example:

- To possess sound knowledge in Neonatal Perinatal medicine
- To recognize and manage common disorders in newborn infants
- To possess the skills to diagnose and treat various NICU conditions and to manage emergency situations
- To function as a leader for health care teams
- To participate in the consultation regarding high-risk fetuses and transport
- To demonstrate effective communication skills and to show empathy toward families and neonates
- To apply ethical considerations to end-of-life or palliative care decisions
- To maintain knowledge and self-education over time
- To demonstrate effective teaching skills to the health care team and to participate in research
- To build leadership capabilities and understand the relevant aspects of staff management and administration (see following table).

Trainee Role	Goals and Objectives
<b>Medical Expert</b>	<ul style="list-style-type: none"> <li>➤ Function effectively as consultants:               <ul style="list-style-type: none"> <li>• Perform consultation with high-risk pregnant women and assess sick neonates who need neonatologist experience. The fellow should be able to respond correctly both verbally and in writing to the consultation</li> <li>• Demonstrate adaptability to all CanMEDS components</li> <li>• Ability to judge ethical issues in neonatal medicine, including but not limited to limits of viability and congenital anomalies, and make the correct decisions</li> <li>• Prioritize duties and show experience in other health-related matters</li> <li>• Respond to family concerns and appreciate their feeling and worries</li> </ul> </li> <li>➤ Establish competencies in neonatal medicine:               <ul style="list-style-type: none"> <li>• Antenatal medicine, including fetal growth and anomalies, placenta function and abnormalities, disease in pregnancy, and safe medication for pregnant women and fetuses</li> <li>• Delivery room practices and resuscitation of term and preterm newborns according to NRP guidelines, along with expected physiological outcomes</li> <li>• Ability to provide intensive care for common medical and surgical conditions for term and preterm neonates</li> <li>• Knowledge of infants' long-term outcomes in the neonatal intensive care unit</li> <li>• Complete knowledge of NICU common procedures and important devices and equipment used in the NICU</li> </ul> </li> </ul>



Trainee Role	Goals and Objectives
	<ul style="list-style-type: none"> <li>➤ Complete and appropriate assessment of a neonate:               <ul style="list-style-type: none"> <li>• Ability to obtain a relevant history and perform complete physical examination</li> <li>• Select appropriate investigations and intervention modalities to make the correct judgment</li> </ul> </li> <li>➤ Effective and efficient use of therapeutic interventions and procedures in neonatal medicine</li> <li>➤ Ability to seek consultation from other specialties relevant to neonatal medicine to help manage patient in the NICU</li> </ul>
<b>Communicator</b>	<ul style="list-style-type: none"> <li>• Good communication is a required skill to gain patient and family satisfaction and help reach desired clinical outcome.</li> <li>• Effective communication will help patients and families trust physician decisions. It respects the family's choice and empowers them to be involved in care.</li> <li>• Ability to respect family privacy and confidentiality and to listen to parents and understand their emotions and concerns</li> <li>• Ability to collect accurate information about mothers' pregnancy history and family histories of disease from medical records, electronic clinical information system, members of the medical team, health care professionals, and the family themselves</li> <li>• Deliver information to families and health care professionals in a way that it is understandable and facilitates participation in decision-making</li> <li>• Exhibit skill in working and understanding families' cultural, socioeconomic, and educational background</li> <li>• Demonstrate effective, consistent communication between the medical team and the family</li> <li>• Document clear and accurate medical notes and reports that insure the safe transfer of medical care</li> </ul>
<b>Collaborator</b>	<ul style="list-style-type: none"> <li>• Ability to work effectively with different health care professionals in the NICU</li> <li>• Respect health care professionals' roles and responsibilities and work with them closely to avoid conflict</li> <li>• Involve health care professionals in developing a patient plan of care</li> </ul>
<b>Health Advocate</b>	<ul style="list-style-type: none"> <li>• Treat the patient and family as a whole and respond to their needs and concerns as part of patient care</li> <li>• Pay attention to individual patient and family characteristics, including education, occupation, and socioeconomic status</li> <li>• Assist families in accessing social services and the financial resources necessary for the care of their infant</li> <li>• Plan and prepare for patient discharge and arrange needed follow up</li> <li>• Identify the required support and services needed to serve the local communities</li> <li>• Be aware of the role of governmental and non-governmental organizations and available public policies that affect mother and newborn health.</li> </ul>

Trainee Role	Goals and Objectives
<b>Leader</b>	<ul style="list-style-type: none"> <li>• Work collaboratively with others</li> <li>• Engage in patient safety initiatives, audits, quality improvement, risk management, occurrence/incident reporting, and complaint management</li> <li>• Participate in the design and function of NICU resource allocation, budgeting, and funding.</li> <li>• Assess cost/benefit ratios of diagnostic and therapeutic interventions and their efficacy, effectiveness, and efficiency</li> <li>• Demonstrate advanced skills in time management, including time for personal improvement</li> <li>• Use information technology to assist in efficient and accurate patient care</li> <li>• Serve in administrative and leadership roles as chair or member of committees and lead quality improvement or patient safety initiatives</li> </ul>
<b>Scholar</b>	<ul style="list-style-type: none"> <li>• Maintain ongoing learning and incorporate new knowledge into practice</li> <li>• Apply evidence-based practices and evaluate medical information and its sources appropriately</li> <li>• Take the lead in educating health care team members about neonatology and its advances</li> <li>• Know the principals of research and research ethics and engage in research that can be published and presented at local or international conferences</li> </ul>
<b>Professional</b>	<ul style="list-style-type: none"> <li>• Demonstrate a commitment to patients, profession, and society through ethical practice</li> <li>• Establish a commitment to patients, profession, and society through participation in profession-led regulation</li> <li>• Show a commitment to physician health and sustainable practices</li> </ul>

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## CONTINUUM OF LEARNING

Fellows see patients with a wide variety of conditions. As a fellow, they have increasing responsibility in the management of these children. The second-year fellow has greater responsibility for supervising and acting in a consultant role.

It is expected that scholars will learn the following skills at each key progression within the neonatology specialty.

### General

- Support and apply NICU patient care policies and protocols
- Ensure standard patient care
- Work cooperatively with all NICU staff to ensure appropriate patient care
- Attend rounds promptly and handover rounds
- Stay in-house during on-call duties and report directly to neonatologist on call
- Assist in evaluation of junior medical staff
- Participate in teaching of residents and nurses

### Specific

- Review all NICU cases with residents
- Help to run NICU daily round
- Review all orders and discharge summaries with residents
- Supervise residents in taking care of critically ill patients
- Attend high risk deliveries and act as a team leader
- Participate in transporting acute cases from other hospitals to the NICU
- Attend neonatal follow-up clinic when assigned
- Participate in research under supervision of neonatologist

The following table describes the different roles of F1 and F2 fellows:

F1	F2
<b>Medical Expert:</b> <ul style="list-style-type: none"><li>• Learn the outcome of varying gestational ages</li><li>• Understand common pregnancy problems, including antepartum assessment, and how they impact both fetuses and newborns</li><li>• Know resuscitation techniques for different scenarios</li><li>• Gain experience in the management of chronic medical problems and interpret special investigations used in the NICU</li><li>• Learn how to provide support for families</li><li>• Gain skills to do neonatal consultation for high-risk mothers</li></ul>	<b>Medical Expert:</b> <ul style="list-style-type: none"><li>• Master all the knowledge gained during F1</li><li>• Develop the ability to make accurate clinical decisions</li></ul>

<ul style="list-style-type: none"> <li>• Master important clinical skills and procedures</li> <li>• Manage critically ill newborns</li> <li>• Acquire knowledge of common neonatal diseases</li> </ul>	
<p><b>Communicator:</b></p> <ul style="list-style-type: none"> <li>• Develop skills in counseling and supporting families of newborns in the NICU</li> <li>• Communicate well with families</li> </ul>	<p><b>Communicator:</b></p> <ul style="list-style-type: none"> <li>• Hone skills in counseling and supporting families</li> <li>• Communicate effectively with families and health care team members</li> </ul>
<p><b>Collaborator:</b></p> <ul style="list-style-type: none"> <li>• Know the abilities of NICU team members, including residents, nurses, and respiratory therapists</li> <li>• Understand the NICU's multidisciplinary environment</li> </ul>	<p><b>Collaborator:</b></p> <ul style="list-style-type: none"> <li>• Be awareness of team strengths and weaknesses and be able to support team members</li> <li>• Work effectively in a multidisciplinary environment</li> </ul>
<p><b>Leader:</b></p> <ul style="list-style-type: none"> <li>• Recognize the system and resources issue related to neonatal care</li> <li>• Become cognizant of the health care team's scope of practice</li> <li>• Understand how clinical practice guidelines and protocols have developed</li> </ul>	<p><b>Leader:</b></p> <ul style="list-style-type: none"> <li>• Develop leadership skills in clinical care and education</li> <li>• Demonstrate skills in accurate time and resource management</li> <li>• Determine the costs and benefits of each intervention and procedure</li> </ul>
<p><b>Health Advocate:</b></p> <ul style="list-style-type: none"> <li>• Acquire knowledge of available resources to facilitate support for families</li> <li>• Help prepare patient for discharge, especially infants with complex medical problems</li> </ul>	<p><b>Health Advocate:</b></p> <ul style="list-style-type: none"> <li>• Give advice to referral physicians and participate in outreach visits</li> <li>• Make a complex discharge care plan for babies with multiple morbidities</li> </ul>
<p><b>Scholar:</b></p> <ul style="list-style-type: none"> <li>• Learn how to research a clinical problem using the library, Medline, Cochrane Library, etc.</li> <li>• Critically appraise medical literature in order to provide evidence-based care</li> <li>• Teach members of the health care team during and after clinical rounds</li> <li>• Take an active role in the education of undergraduate and postgraduate medical staff</li> <li>• Develop an awareness of important prenatal and neonatal trials</li> <li>• Understand the concept of evidence-based practice</li> </ul>	<p><b>Scholar:</b></p> <ul style="list-style-type: none"> <li>• Gain insight into their own career goals</li> <li>• Practice according to the best evidence available</li> <li>• Show ability to maintain independent, life-long learning</li> <li>• Acquire an understanding of research and conduct a research study</li> <li>• Critically appraise medical literature</li> </ul>

<p><b>Professional:</b></p> <ul style="list-style-type: none"> <li>• Develop an awareness of ethical issues related to the care of the mother, fetus, and newborn</li> <li>• Communicate effectively with families</li> <li>• Acquire technical skills for NICU resuscitation</li> </ul>	<p><b>Professional:</b></p> <ul style="list-style-type: none"> <li>• Manage ethical and cultural issues related to perinatal care</li> <li>• Resolve conflicts</li> <li>• Active role in teaching junior team members</li> </ul>
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## Overall Educational Objectives

- Fellows should participate in the following:
  - Delivery room resuscitation
  - Antenatal consultations
  - Family meetings and counseling
- Present a neonatal seminar, clinical conference, journal club and grand round
- Maintain communication with families
- Supervise care for all babies in the unit and supervise residents' work and education
- Get involved in managing patient flow in the unit

## Objectives of the Neonatal Intensive Care Rotation (NICU level- III)

### Medical Expert

- Learn the outcome of pregnancies of varying gestational age and interpret antepartum and intrapartum fetal assessment
- Gain experience in antenatal consultations and participate in counseling and support of families
- Gain skills in neonatal resuscitation and stabilization, unanticipated emergencies, and minor problems
- Develop a sound understanding of the principals involved in the assessment of fetal well-being
- Understand the effect of maternal and perinatal factors on the health of both fetus and newborn.
- Develop competence in the assessment, investigation, and management of sick preterm and term infants requiring medical or surgical care. This will include:
  - Disorders of adaptation to extra-uterine life
  - Complex congenital disorders
  - Respiratory, cardiac, renal gastrointestinal, endocrine, metabolic, and neurological disorders
  - Chronic care
- Become familiar with the general principles of critical care:
  - Respiratory support
  - Temperature control
  - Infection control
  - Fluid and electrolyte balance
  - Nutrition support
  - Appropriate use of monitors
  - Appropriate use of laboratory investigations
- Anticipate and prevent iatrogenic problems associated with intensive care

### **Leader**

- Develop the judgment and expertise to organize the transfer of a sick newborn from a referral hospital
- Understand the resource issues related to the provision of perinatal care and the need of community hospitals
- Know clinical guidelines and how they are implemented in daily work

### **Scholar**

- Supervise and teach other members of the NICU health care team during daily rounds and neonatal resuscitation
- Learn how to research a clinical problem
- Critically appraise medical literature in order to implement evidence-based medical practice

### **Communicator and Collaborator**

- Gain experience in subspecialty consultation and collaboration in the care of newborns with multisystem disorders
- Counsel and support parents of infants receiving intensive care and provide realistic support
- Communicate and work effectively in the multidisciplinary team approach to neonatal care
- Understand the roles of other members of the team, including nurses, respiratory therapists, dietitians, and physiotherapists
- Identify patients requiring patient care conferences for management and ethical issues and thereafter organize the conferences

### **Health Advocate**

- Develop the necessary skills to plan the discharge of a neonate with chronic problems
- Be aware of available resources in the community to help in the discharge of complex cases

### **Professional**

- Develop an awareness of ethical issues in the care of critically sick newborn infants with multiple medical and surgical problems
- Provide culturally sensitive and respectful counseling
- Be a role model for other health care team members and respect patient confidentiality

### **Skills required during NICU level-III rotation**

During this rotation, fellows will develop the skills required to support infants requiring intensive care. This will include:

- Neonatal resuscitation and stabilization
- Oral and nasal endo-tracheal intubation
- Umbilical arterial and venous catheterization
- Peripheral arterial catheterization
- Peripheral venous insertion
- Percutaneous central venous catheter
- Use of non-invasive care respiratory monitors
- Use of intensive care monitoring systems

- Insertion of chest tubes
  - Septic work-up
  - Suprapubic blood culture
  - Lumbar puncture
- Use of ventilators, including high frequency ventilation and inhaled nitric oxide
- Parenteral nutrition
- Exchange transfusion
- Therapeutic hypothermia

## Objectives of the Intermediate Care Unit Rotation (ICN)

### Medical Expert

- Develop the knowledge and skills to manage infants requiring continuing care
- Recognize the special needs of infants requiring prolonged hospitalization, including respiratory support, nutrition and growth, and neurodevelopment

### Leader

- Develop the judgment and expertise to organize the transfer of a sick newborn from a referral hospital
- Understand the resource issues related to provision of perinatal care and need in community hospitals
- Know clinical guidelines and how they are implemented in daily work
- Manage and coordinates the activities of the multidisciplinary team

### Scholar

- Supervise and teach other health care team members during daily rounds and neonatal resuscitation
- Learn how to research a clinical problem
- Critically appraise medical literature in order to implement evidence-based medical practice

### Communicator and Collaborator

- Recognize the stress placed on parents when infants require prolonged intensive care
- Counsel and support parents.
- Arrange with medical services during the discharge of an infant
- Coordinate the discharge of infants from the NICU
- Supervise and teach pediatric residents
- Manage the multidisciplinary team under the supervision of the neonatologist
- Work in a collaborative manner with other members of the team
- Arrange patient care conferences as required

### Health Advocate

- Develop the necessary skills to plan the discharge of a neonate with chronic problems
- Be aware of available community resources to help in the discharge of complex cases
- Plan and coordinate the discharge of infants, including parental education

## Professional

- Develop an awareness of ethical issues in the care of critically sick newborn infants with multiple medical and surgical problems
- Provide culturally sensitive and respectful counseling
- Be a role model for other health care team members and respect patient confidentiality

## Skills Required During ICN rotation

During this rotation, fellows will develop the skills required to support infants requiring continuing care. This will include:

- Peripheral venous insertion
- Use of continuous respiratory monitors
- Septic work up, including blood culture, suprapubic tap, and lumbar puncture
- Parenteral nutrition
- Overnight pulse oximeter monitoring
- Hearing screen

## Objectives of the Feto-Maternal Medicine Rotation

### Medical Expert

- Become familiar with normal maternal and fetal physiology
- Become familiar with high-risk pregnancies and the pathophysiology of common medical/obstetrical/surgical pregnancy complications, their effects on pregnancy and on the fetus/newborn, and also the effects of pregnancy on disease
- Common conditions include:
  - Diabetes mellitus
  - Hypertension
  - Antepartum hemorrhage
  - Preterm labor
  - Premature rupture of membranes
  - Chorioamnionitis
  - Cardiac disease in pregnancy
  - Autoimmune Diseases such as systemic lupus erythematosus, idiopathic thrombocytopenic purpura
  - Perinatal infections
  - Congenital abnormalities
  - Thyroid disease
- Understand the physiology of labor, the mechanism of delivery, and the effects of both on the fetus/newborn
- Recognize high-risk labor and delivery and plan care in anticipation
- Be aware of intrapartum surveillance of mother and fetus, including fetal heart rate monitoring, fetal blood gas sampling, and fetal biophysical profile
- Know maternal physiological changes during pregnancy
- Be aware of antenatal investigative techniques, their indications, risks, and benefits:
  - Genetic amniocentesis
  - Chorionic villous sampling (CVS)
  - Nuchal translucency



- Biophysical profile (BPP)
- Non-stress test (NST)
- IPS/NIPT
- 18–20 week anatomical ultrasound (US)
- Growth scans assessment of fetal growth
- Fetal Doppler
- Understand the effect of various maternal illnesses and their effect on pregnancy as well as the effects of maternal medications and environmental exposures
- Know the risks and benefits of treatments used in pregnancy:
  - Aspirin
  - Antenatal corticosteroids
  - MgSo4
  - Tocolysis
  - Insulin

### **Communicator**

- Understand the roles of other members of the team, including nurses, midwives, and US technicians
- Identify patients requiring patient care conferences for management and ethical issues and thereafter organize the conferences
- Be able to clearly communicate relevant information required in consultations and provide appropriate documentation

### **Collaborator**

- Communicate and work effectively in a multidisciplinary team to take care of the pregnant mother

### **Leader**

- Develop the judgment and expertise to organize the transfer of a sick newborn from a referral hospital
- Understand the resource issues related to provision of perinatal care and need in community hospitals
- Be able to apply knowledge in making decisions regarding timing of delivery and formulate management care plans for the mother and the newborn infant

### **Health Advocate**

- Understand principles of regionalization in perinatal care and maternal transfers
- Be aware of available community resources to help in the discharge of complex cases

### **Scholar**

- Learn to research a clinical problem and critically appraise medical literature to implement evidence-based medical practice
- Practice an effective, self-directed learning strategy

### **Professional**

- Develop an awareness of ethical issues in the care of high-risk mothers with medical and/or surgical problems
- Provide culturally sensitive and respectful counseling with regard to palliative care and DNR.

### **Objectives of the Follow-up Clinic Rotation**

#### **Medical Expert**

- Understand the normal development for preterm infants and available tests to assess neurodevelopmental outcomes
- Ability to recognize and perform common developmental tests done in neonatal follow-up clinics
- Awareness of infants at risk of neurodevelopmental handicap and the need for community support services
- Appreciate how clinic follow up with preterm babies can guide parents' antenatal counseling

#### **Communicator**

- Counsel families in the clinic
- Appreciate the effect of infants with developmental delays on the family's psychosocial aspect

#### **Collaborator**

- Communicate and work effectively in a multidisciplinary team during the neonatal follow-up program (physicians, physiotherapists, occupational therapists, speech pathologists, and psychologists)
- Appreciate the value of multidisciplinary teams in the care of affected infants

#### **Leader**

- Gain awareness of the preparation required when planning to discharge a baby from the NICU
- Understand the resource issues related to provision of neonatal follow-up program and the need in community hospitals
- Be aware of available community resources to help in the discharge of complex cases

#### **Scholar**

- Become familiar with literature on neonatal follow-ups

#### **Professional**

- Develop an awareness of ethical issues in the care of high-risk infants with developmental delay problems

## Objectives of the Elective Rotation

Elective rotation goals and objectives will vary by fellow and by rotation. A research elective should follow the research goals and objectives.

## Research Rotation

Over two years of fellowship a fellow completes three blocks of research. The program emphasizes the quality of the experience and the result, since research is a requirement for the final exam. Fellows will be trained as a clinical researcher with in-depth knowledge of statistical and analytical skills in population based, clinical studies or outcomes research. The guiding principle of the clinical research education is to have fellows to perform a clinical research project under supervision.

### Objectives

- Develop the ability to appraise literature critically
- Discuss the basics of epidemiology, statistical analysis, and study design

Research rotations include the following responsibilities:

- Take part in research projects (minimum of one project) under a neonatologist's supervision. Fellows may become involved in an ongoing project or initiate a new one.
- Involvement should ideally include helping in the design, conduct, and evaluation of the study.
- Prepare an abstract and present the findings at a scientific meeting or publish at least one manuscript in a peer-reviewed journal
- Maintain clinical expertise during research training

To initiate research, fellows should plan to do the following:

### First year

First year fellows would be allowed one block of research activities. During the first year, it is expected that fellows will accomplish the following:

- Attend a library course/research methodology course
- Select a research and/or scholarly project
- Write a formal proposal with a literature review, hypothesis, methodology, and expected outcomes
- This will be done in collaboration with their chosen supervisor.
- Fellows must apply to the hospital's Research Ethics Board (REB) committee before starting the project.

As a general requirement:

- The fellow's supervisor must attach a letter to the proposal indicating their willingness and time availability to supervise the fellow.
- The proposal should include the required number of months for project completion.
- Both author and participants must sign a letter of agreement to safeguard the supervisor and the fellow's rights.

## **Second year**

Second year fellows would be allowed to complete two blocks of research activities. They are expected to complete the following:

- Submit progress reports to program directors
- Present their research findings in the Neonatal Perinatal Fellowship research meeting before the final exam

Fellows are also encouraged during their second year to submit abstracts to national and international meetings and to publish their work in scientific journals.

## **Research Ethics Board Approval**

- All research must be approved by each center's Research Ethics Board (REB).
- Studies recruiting patients from more than one site require approval from all sites involved in the study.

## **General Guidelines for Research Supervisors**

- Supervisors should be able to provide support for fellows in developing study design, assisting with implementation of study and patient recruitment, teaching any techniques required, and submitting for publication or presentation at national/international conferences.
- Authorship of any work must be agreed upon before commencing the study.
- A fellow should be the first author for any work that meets the following criteria:
  - Work was initiated and completed by the fellow
  - The fellow did a major portion of the work involved (i.e., chart review, collecting data, recruiting patients, publishing the results)
  - The fellow writes the manuscript under the supervision of the supervisor

## **Neonatology Research Evaluation Form (see appendix)**

## CORE CLINICAL PROBLEMS AND REPRESENTATIVE DISEASES

Core clinical problems include symptoms, signs, laboratory or investigation results, and referrals. Priority is given to conditions and diseases that are common; treatable; life, limb, or vision threatening; or preventable.

Each core clinical problem is categorized into:

- Core Specialty Level: to be mastered by F1–F2 level
- Mastery Level: to be mastered by F2 level

Competency Level	F1	F2
Take a focused history	✓	✓
Prioritize patients	✓	✓
Concentrate on immediate/emergency management	✓	✓
Generate the most likely diagnosis and provide focused differential diagnoses	✓	✓
Describe the pathophysiological/clinical-anatomical basis of the condition	✓	✓
Rationalize, order, and interpret appropriate investigations	✓	✓
Recognize secondary complications/adverse events/severity	✓	✓
Counsel patients/families/caregivers regarding the medical condition	✓	✓
Teach students, fellow colleagues, and other health care professionals regarding the condition	✓	✓
Manage complex psychosocial/financial/behavioral aspects of the condition		✓

### Procedures List

Trainees must maintain a logbook of procedures performed. Trainees are required to comply with the minimum number of procedures under each category as determined by the scientific committee of Saudi Neonatal Perinatal Medicine Fellowship.

### List of Category I Procedures

This list includes procedures that trainees are assumed to be competent doing before joining the program

Pre-requisite Procedures
Venipuncture
Capillary blood sampling
Arterial blood sampling
Simple suturing
SC, IV, IM injections
Basic life support (BLS)
Neonatal resuscitation (NRP)
Lumbar puncture
Arterial blood gas

**Pre-requisite Procedures**

Oral intubation
Blood extraction
Peripheral line insertion
Umbilical vein catheterization
Umbilical artery catheterization
Electrocardiography (ECG) reading
Urinary catheterization
Intra-osseous line
Suprapubic aspiration of the bladder
Oro/nasogastric tube placement

**List of Category II Procedures**

**Mandatory to learn Core Procedures**

Arterial line insertion
Thoracocentesis/needle decompression
Chest tube insertion
Nasal intubation
D/C shock
Paracentesis/peritoneal tap
Maintain Neonatal Resuscitation Program provider status
Neonatal resuscitation and post-resuscitative care
Endotracheal intubation
Laryngeal mask airway insertion
Exchange transfusion
Peripherally inserted central catheter (PICC) placement
Use of continuous respiratory monitors
Use of ventilators including high frequency ventilation and inhaled nitric oxide
Parenteral nutrition
Surfactant administration
Amplitude integrated electroencephalography (aEEG) or cerebral function monitoring (CFM) reading and therapeutic hypothermia

**List of Category III Procedures:**

**Optional Procedures**

Central line insertion
Pericardiocentesis
Targeted neonatal functional ECHO (TnECHO)
US head
Extracorporeal membrane oxygenation (ECMO)

### Behavioral/Communication Skills

List of Behavior/Communication Skills
Conduct an open interview
Breaking bad news
Counseling
Discharge against medical advice (DAMA)
Procedure consent
Initiate new therapy
Difficult parents
Manage conflict
Patient who refuses treatment

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## MENTORSHIP

### Definition

The mentorship program in Neonatal Perinatal Fellowship is a career guidance and goal setting management tool in which a neonatology fellow (mentee) gets support from a consultant (mentor) to provide support in their work or professional development. Finding a mentor can be an integral part of career planning.

### Purpose

- To provide support to fellows in career planning, as needed
- To provide information on development opportunities and ideas for professional growth
- To support fellow's self-confidence
- To improve the fellow's quality of medical practice
- To enhance fellow's professionalism
- To share knowledge and experiences with the fellow

### Roles and Responsibilities

The duties of a mentor include:

- Contact the fellow to check learning progress at least once every 2–3 months, more as needed, in person or over the phone. This meeting must be documented and records provided to the program director.
- Provide guidance, support, encouragement, and constructive feedback
- Maintain confidentiality
- Set boundaries as to the scope of mentoring
- Commit to agreed standards for duration of the mentorship program.

A mentor should avoid:

- Talking with the Program Director on behalf of the mentee
- Overriding Program Director's orders and communication with the mentee
- Interfering with the mentee's rotations, evaluations, and fellowship program regulations: that is the Program Director's sole responsibility. In case of conflict, the Program Director's orders and opinions will be carried out.

The duties of the mentee (fellow):

- Report to the mentor periodically to discuss progress
- Take an active role in learning
- Reflect on personal professional development, identify gaps, and track progress
- Appreciate that the mentor will not have all the answers but may help refer to others who can help
- Submit activity report to the Program Director at the end of the academic year



## **Selection Process**

Fellows have the opportunity to choose their own mentor. It is recognized that many fellows entering the fellowship training program will have little knowledge of faculty members initially. However, after a period of six months, fellows should be in a position to choose a mentor and it is expected that by half way through the first academic year that each new fellow will approach a mentor. Fellows will be reminded after 6 months in the program. If they have not selected a mentor by this time, a mentor will be selected for them by program director. If fellows require help approaching a mentor or feel like they need to change mentors, they need to contact the program director.

## **Important notes**

- Program Director and heads of the unit/chairman will not be a mentor in order to avoid conflict
- Each trainee must have an assigned mentor
- A mentor must not have more than one trainee at any given point in time
- Assigned mentor must follow the trainee for at least one year

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## ON-CALLS AND LEAVES

### On-Calls Duties

Duty hours will be in compliance with the SCFHS executive policy and the frequency of calls will be determined as per SCFHS rules. (Available on SCFHS website).

Fellows will be on-call during weekends and nights. Fellows will do calls in-house and are responsible for covering and coordinating NICU and delivery room during their on-call time.

Fellows will perform five to seven on-call shifts per block, and are expected to perform their regular duty till mid-day post call for their patients' continuity of care.

### VACATION AND CONFERENCE LEAVE

- All leaves should be utilized according to the SCFHS general rules and regulations
- Fellows in the program are entitled to annual, national, and educational leave
- Fellows are entitled to four weeks' vacation annually and a maximum of 10 days for Eid or as per SCFHS rules and regulations
- Requests for vacation time must be given at least four weeks in advance
- All leaves should be coordinated with and approved by the Program Director and should not interfere with the workflow

### Protected Time (Activities)

Trainees have the right to attend activities without interruption and must have protected time for activities.

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## TEACHING AND LEARNING ACTIVITIES

### General Principles

Teaching and learning is structured and programmed; nevertheless, fellows must also take responsibility for self-directed learning. Every week 4–6 hours will be reserved for formal training time. The core education program (CEP) includes formal teaching and learning activities on universal topics, core specialty topics, and trainee-selected topics.

- 1) Formal Teaching and Learning Activities:
  - Core specialty topics
  - Universal topics
  - Fellow's selected topics
- 2) Practice-Based Learning (PBL), (please see appendix) such as:
  - Morning report case presentations
  - Morbidity and mortality review
  - Journal club
  - Case presentation/Fellows seminars
  - Grand round/guest speakers on core specialty topics
  - Joint specialty meeting
  - Hospital grand rounds and other (CMEs)
- 3) Work-Based Learning (WBL) (please see appendix), such as:
  - Daily-round-based learning
  - On-call-based learning
  - Clinic-based learning
  - Workshops and courses
- 4) Self-directed Learning (please see appendix)

## CORE SPECIALTY TOPICS

Core specialty topics are important pediatric clinical problems. The fellowship uses interactive, case-based discussions with pre-materials to train fellows in these topics, as well as workshops and stimulation to develop skills in core procedure.

The following table provides examples of core specialty topics.

Topics	What to learn
<b>Maternal-fetal medicine</b>	<ul style="list-style-type: none"> <li>• Assessment of fetal health and gestation</li> <li>• Diabetes, Hypertension during pregnancy</li> <li>• Other high risk pregnancies</li> <li>• Infertility and IVF</li> <li>• Anesthesia during labor and delivery</li> </ul>
<b>Resuscitation</b>	<ul style="list-style-type: none"> <li>• Successful completion of the neonatal resuscitation program (NRP)</li> <li>• High risk pregnancies and fetuses</li> <li>• Effective communication with the multidisciplinary team handling mother and infant</li> <li>• Safe transfer of infant to NICU from delivery room</li> </ul>
<b>Transport</b>	<ul style="list-style-type: none"> <li>• Understanding of safe neonatal support</li> <li>• Effectively communication with both neonatologist on-call and parents at each stage of transportation</li> </ul>
<b>Evaluation of therapeutic recommendations, database management, and information retrieval</b>	<ul style="list-style-type: none"> <li>• Databases</li> <li>• Evaluating therapeutic recommendations</li> </ul>
<b>Ethical decision-making in the neonatal-perinatal period</b>	<ul style="list-style-type: none"> <li>• Counseling parents and informed consent</li> <li>• Neonatal research.</li> </ul>
<b>Placental function and diseases</b>	<ul style="list-style-type: none"> <li>• Embryologic development of placenta</li> <li>• Placental circulation</li> <li>• Placental anatomy</li> <li>• Placental physiology</li> </ul>
<b>Abnormalities of fetal growth</b>	<ul style="list-style-type: none"> <li>• Intrauterine growth restriction/retardation and infants who are small for gestational age.</li> <li>• Macrosomia</li> </ul>
<b>Multiple births</b>	<ul style="list-style-type: none"> <li>• Spontaneously and artificially conceived multiple-fetus pregnancies</li> <li>• Twin-to-twin transfusion</li> <li>• Neonatal follow-up clinics</li> </ul>
<b>Endocrine disorders in pregnancy</b>	<ul style="list-style-type: none"> <li>• Diabetes in pregnancy</li> <li>• Thyroid disorders</li> </ul>

<b>Hypertensive complications of pregnancy</b>	<ul style="list-style-type: none"> <li>• Classifications of hypertensive disorders during pregnancy</li> <li>• Preeclampsia</li> <li>• Eclampsia</li> <li>• Management</li> </ul>
<b>Antepartum fetal assessment</b>	<ul style="list-style-type: none"> <li>• General principles of fetal biophysical assessment</li> <li>• Ultrasonography</li> <li>• Doppler flow studies</li> <li>• Amniocentesis</li> </ul>
<b>Prematurity</b>	<ul style="list-style-type: none"> <li>• Trends in rates of preterm birth</li> <li>• Etiology</li> <li>• Risk factors</li> <li>• Screening for preterm birth</li> </ul>
<b>Prenatal genetic diagnosis</b>	<ul style="list-style-type: none"> <li>• History of the international human genome project</li> <li>• Newborn screening</li> <li>• DNA microarray analysis</li> </ul>
<b>Evaluation of dysmorphic infants</b>	<ul style="list-style-type: none"> <li>• History</li> <li>• Pedigree analysis and family history</li> <li>• Physical examination</li> <li>• Literature review</li> <li>• Lab tests and diagnosis</li> </ul>
<b>Specific chromosome disorders in newborns</b>	<ul style="list-style-type: none"> <li>• Human karyotype</li> <li>• Trisomies</li> </ul>
<b>Inborn errors of metabolism</b>	<ul style="list-style-type: none"> <li>• Inborn errors of carbohydrate metabolism</li> <li>• Inborn errors of ammonia metabolism</li> <li>• Inborn errors of amino acid metabolism</li> <li>• Inborn errors of organic acid metabolism</li> <li>• Fatty acid oxidation disorder</li> </ul>
<b>Acid-base, fluid, and electrolyte management</b>	<ul style="list-style-type: none"> <li>• Fluid and electrolyte balance</li> <li>• Fluid and electrolyte management in preterm and term neonates</li> <li>• Disturbance of acid-base balance in newborns</li> </ul>
<b>Pharmacologic principles and practicalities</b>	<ul style="list-style-type: none"> <li>• Pharmacokinetic principles</li> </ul>
<b>Immunology of the fetus and newborn</b>	<ul style="list-style-type: none"> <li>• Maternal and placental immunology</li> <li>• Developmental fetal-neonatal immunology</li> <li>• Specific immunologic deficiencies</li> <li>• Immunizations</li> </ul>
<b>Viral infections of fetuses and newborns</b>	<ul style="list-style-type: none"> <li>• Diagnostic approach</li> <li>• (TORCH)</li> </ul>

<b>Bacterial, fungal infections, and meningitis</b>	<ul style="list-style-type: none"> <li>• Neonatal bacterial sepsis</li> <li>• Pathogenesis and pathways of early-onset sepsis</li> <li>• Diagnostic approach to neonates with suspected sepsis</li> <li>• Prevention</li> <li>• Treatment</li> <li>• Infection control</li> <li>• Antibiotic and adjunctive therapies</li> <li>• Fungal infections</li> </ul>
<b>Lung development</b>	<ul style="list-style-type: none"> <li>• The embryonic phases</li> <li>• Physical factors influencing lung development</li> </ul>
<b>Control of breathing</b>	<ul style="list-style-type: none"> <li>• Fetal breathing</li> <li>• Control of breathing in term and preterm infants</li> <li>• Apnea of premature infants</li> </ul>
<b>Newborn pulmonary physiology</b>	<ul style="list-style-type: none"> <li>• Lung mechanics and lung volumes</li> <li>• Measurements of lung mechanics</li> <li>• Pulmonary hemorrhage</li> </ul>
<b>Principles of respiratory monitoring and therapy</b>	<ul style="list-style-type: none"> <li>• Mechanical ventilation</li> <li>• Continuous positive airway pressure</li> <li>• Intermittent positive pressure ventilation</li> <li>• Patient-triggered ventilation</li> <li>• High-frequency ventilation</li> </ul>
<b>Surfactant treatment of respiratory disorders</b>	<ul style="list-style-type: none"> <li>• Composition of surfactant</li> <li>• Surfactant development, turnover, synthesis, and secretion</li> <li>• Clinical uses of surfactant</li> <li>• New approaches</li> </ul>
<b>Respiratory distress in preterm infants</b>	<ul style="list-style-type: none"> <li>• Respiratory Distress Syndrome</li> <li>• Newborn transient tachypnea</li> </ul>
<b>Respiratory failure in full-term infants</b>	<ul style="list-style-type: none"> <li>• Persistent pulmonary hypertension in newborns</li> <li>• Meconium aspiration pneumonia</li> <li>• Extracorporeal membrane oxygenation</li> </ul>
<b>Bronchopulmonary dysplasia</b>	<ul style="list-style-type: none"> <li>• Epidemiology</li> <li>• Pathobiology</li> <li>• Pathologic disease stages</li> <li>• Etiologic factors</li> <li>• Prevention factors</li> <li>• Clinical course</li> <li>• Treatment</li> </ul>

<b>Anomalies of the airways, mediastinum, and lung parenchyma</b>	<ul style="list-style-type: none"> <li>• Anomalies of the airways.               <ul style="list-style-type: none"> <li>○ Nasal obstructive disorders</li> <li>○ Pharyngeal, Laryngeal, Trachea deformities</li> </ul> </li> <li>• Disorders of the mediastinum               <ul style="list-style-type: none"> <li>○ Congenital bronchogenic cysts</li> </ul> </li> <li>• Malformations of the lung parenchyma.               <ul style="list-style-type: none"> <li>○ Congenital cystic adenomatous malformation</li> <li>○ Bronchopulmonary sequestration</li> <li>○ Congenital labor emphysema</li> </ul> </li> </ul>
<b>Disorders of the chest wall, pleural cavity, and diaphragm</b>	<ul style="list-style-type: none"> <li>• Disorders of the chest wall</li> <li>• Disorders of the pleural cavity               <ul style="list-style-type: none"> <li>○ Chylothorax and hydrothorax</li> </ul> </li> <li>• Disorders of the diaphragm.               <ul style="list-style-type: none"> <li>○ Congenital diaphragm hernia</li> </ul> </li> </ul>
<b>Approach to congenital heart disease</b>	<ul style="list-style-type: none"> <li>• Segmental analysis of congenital heart disease</li> <li>• Embryology and development</li> <li>• Echocardiography</li> </ul>
<b>Common congenital heart diseases</b>	<ul style="list-style-type: none"> <li>• Patent ducts arteriosus in preterm</li> <li>• Congenital lesion with a predominant left-to-right shunt               <ul style="list-style-type: none"> <li>○ Ventricular septal defect</li> <li>○ Atrial septal defect</li> </ul> </li> <li>• Congenital lesions with duct-dependent systemic blood flow               <ul style="list-style-type: none"> <li>○ Critical aortic stenosis</li> <li>○ Coarctation of the aorta</li> <li>○ Interrupted aortic arch</li> <li>○ Hypoplastic left heart syndrome</li> </ul> </li> <li>• Lesions with duct-dependent pulmonary blood flow               <ul style="list-style-type: none"> <li>○ Ebstein anomaly</li> <li>○ Total anomalous pulmonary venous return</li> <li>○ Transposition of the great arteries</li> <li>○ Tetralogy of Fallot</li> </ul> </li> <li>• Management of congenital heart disease</li> <li>• Neurological outcome</li> </ul>
<b>Arrhythmias in fetuses and newborns</b>	<ul style="list-style-type: none"> <li>• Assessment of fetal arrhythmias</li> <li>• Fetal/neonatal bradycardia, tachycardia, heart block</li> <li>• Management</li> </ul>
<b>Neurological system development</b>	<ul style="list-style-type: none"> <li>• Central nervous system vascular development</li> <li>• Regulation of cerebral blood flow and energy metabolism</li> <li>• Neonatal neuroimaging</li> </ul>
<b>Congenital malformation of the central nervous system</b>	<ul style="list-style-type: none"> <li>• Primary and secondary neural tube formation</li> <li>• Disorders of neuronal proliferations</li> </ul>

<p><b>Central nervous system injury and neuroprotection</b></p>	<ul style="list-style-type: none"> <li>• Injury and protection in the developing nervous system</li> <li>• Interventricular and per ventricular hemorrhage in the preterm infant             <ul style="list-style-type: none"> <li>○ Grading of intraventricular hemorrhage</li> <li>○ Outcome and prognosis</li> <li>○ Prevention</li> <li>○ Management</li> </ul> </li> <li>• Hypoxic-ischemic reperfusion injury in the newborn</li> <li>• Perinatal trauma</li> </ul>
<p><b>Neonatal seizures</b></p>	<ul style="list-style-type: none"> <li>• Clinical seizure criteria</li> <li>• Types</li> <li>• Electrographic seizure criteria</li> <li>• Antiepileptic medications</li> <li>• Effects of neonatal seizures on brain development</li> </ul>
<p><b>Nutrition</b></p>	<ul style="list-style-type: none"> <li>• Enteral nutrition for the at-risk neonatal</li> <li>• Human milk</li> <li>• Human milk fortification</li> <li>• Parenteral nutrition</li> </ul>
<p><b>Gastrointestinal system Structural anomalies of the gastrointestinal tract</b></p>	<ul style="list-style-type: none"> <li>• Gastrointestinal system Disorders of the teeth, mouth, and neck</li> <li>• Disorder of the esophagus             <ul style="list-style-type: none"> <li>○ Esophageal atresia with tracheoesophageal fistula</li> </ul> </li> <li>• Disorders of the stomach</li> <li>• Disorders of the intestine</li> <li>• Mechanical obstructions             <ul style="list-style-type: none"> <li>○ Extrinsic obstruction</li> </ul> </li> </ul>
<p><b>Abdominal wall problems</b></p>	<ul style="list-style-type: none"> <li>• Omphalocele</li> <li>• Gastroschiasis</li> </ul>
<p><b>Necrotizing enterocolitis and short bowel syndrome</b></p>	<ul style="list-style-type: none"> <li>• Necrotizing enterocolitis.             <ul style="list-style-type: none"> <li>○ Epidemiology and pathogenesis</li> <li>○ Bowel ischemia</li> <li>○ Treatment</li> <li>○ Complications</li> </ul> </li> <li>• Short bowel syndrome</li> </ul>
<p><b>Developmental biology of hematologic system Homeostatic disorders</b></p>	<ul style="list-style-type: none"> <li>• Overview of embryonic hematopoietic system</li> <li>• Developmental changes in the regulation of erythropoiesis</li> <li>• Physiology of homeostasis</li> <li>• Hemorrhagic disorders</li> <li>• Approach to the newborn with bleeding</li> <li>• Thromboembolic disorders</li> <li>• Acquired prothrombotic disorders</li> <li>• Platelet disorders</li> </ul>



<b>Erythrocyte disorders in infants</b>	<ul style="list-style-type: none"> <li>• Normal erythrocyte physiology</li> <li>• General approach to anemic infants</li> <li>• Blood transfusions in the treatment of anemia</li> <li>• anemia</li> <li>• Physiological anemia of infancy and prematurity</li> <li>• Polycythemia</li> </ul>
<b>Neonatal hyperbilirubinemia</b>	<ul style="list-style-type: none"> <li>• Physiologic jaundice</li> <li>• Physiologic mechanisms</li> <li>• Unconjugated hyperbilirubinemia</li> <li>• Conjugated hyperbilirubinemia</li> </ul>
<b>Renal and genitourinary systems Developmental abnormalities of the kidneys and genitourinary system</b>	<ul style="list-style-type: none"> <li>• Renal morphogenesis and development of renal function</li> <li>• Renal morphogenesis</li> <li>• Multicystic kidney</li> <li>• Renal dysplasia</li> </ul>
<b>Endocrine disorders</b>	<ul style="list-style-type: none"> <li>• Embryology, developmental biology, and anatomy of the endocrine system</li> <li>• Axis of glands</li> <li>• Disorders of calcium and phosphorus</li> <li>• Neonatal hypo- and hyper-calcemic</li> <li>• Metabolic bone disease in newborns and infants</li> </ul>
<b>Disorders of the adrenal gland</b>	<ul style="list-style-type: none"> <li>• Control of glucocorticoid and mineralocorticoid production</li> <li>• Adrenal development</li> <li>• Adrenal insufficiency</li> <li>• Disorders of adrenal excess</li> </ul>
<b>Ambiguous genitalia in newborns</b>	<ul style="list-style-type: none"> <li>• The embryology of sexual differentiation</li> <li>• Clinical assessment</li> <li>• Disorders resulting in ambiguous genitalia</li> <li>• Overview of surgical management</li> </ul>
<b>Disorders of the thyroid gland.</b>	<ul style="list-style-type: none"> <li>• Basic science of thyroid function</li> <li>• Control of thyroid hormone production</li> <li>• Congenital hypothyroidism</li> </ul>
<b>Disorders of carbohydrate metabolism</b>	<ul style="list-style-type: none"> <li>• Hypoglycemia</li> <li>• Hyperglycemia</li> </ul>
<b>Common neonatal orthopedic ailments</b>	<ul style="list-style-type: none"> <li>• Developmental hip dysplasia</li> <li>• Torticollis</li> <li>• Foot deformities</li> <li>• Torsional deformities of the lower extremities</li> <li>• Obstetric trauma</li> <li>• Neonatal osteomyelitis and septic arthritis</li> </ul>

<b>Congenital malignant disorders</b>	<ul style="list-style-type: none"> <li>• Epidemiology, etiology, and diagnosis of neonatal malignancy</li> <li>• Specific neoplasms                         <ul style="list-style-type: none"> <li>○ Neuroblastoma</li> <li>○ Congenital leukemia</li> </ul> </li> <li>• Germ cell tumors                         <ul style="list-style-type: none"> <li>○ Retinoblastoma</li> <li>○ Histiocytosis</li> </ul> </li> </ul>
<b>Dermatologic conditions</b>	<ul style="list-style-type: none"> <li>• Skin development</li> <li>• Skin disorders (Ichthyoses, Collodion baby, Epidermolysis bullosa)</li> <li>• Hemangiomas</li> <li>• Vascular malformations</li> <li>• Hypo pigmented lesions</li> </ul>
<b>Disorders of the eye</b>	<ul style="list-style-type: none"> <li>• Retinopathy of prematurity</li> <li>• Congenital disorders of motility</li> <li>• Eye infections</li> </ul>

### Universal Topics

The Saudi Commission for Health Specialties intends to develop an e-learning platform to deliver high value, interdisciplinary topics of the utmost importance to the trainee to ensure that they all receive high quality teaching and develop essential core knowledge. These topics are common to all specialties and are delivered in a modular fashion.

At the end of each learning unit, there is an on-line formative assessment. Upon completion of all topics, trainees undertake a combined summative assessment in the form of context-rich multiple-choice questions (MCQ) in which they must attain minimum competency.

All trainees must attain minimum competency in the summative assessment. The following table shows mandatory topics that can be assessed in summative manner along with specialty examinations.

F1	F2
1. Safe drug prescribing	1. Acute pain management
2. Sepsis	2. Patient advocacy
3. Blood transfusions	3. Ethical issues: treatment refusal, patient autonomy
4. Managing a hospitalized patient's fluid levels	4. Role of doctors in death and dying

### F1 competencies

1. *Safe drug prescribing. At the end of the unit, fellows should be able to:*
  - Recognize the importance of safe drug prescriptions
  - Describe possible adverse drug reactions with examples of commonly prescribed drugs that can cause such a reaction

- Apply principles of drug-drug interaction, drug-disease interaction, and drug-food interaction to common situations
  - Apply principles of prescribing drugs in special situations such as renal and liver failure
  - Apply principles of prescribing drugs in pregnancy and lactation
  - Promote evidence-based, cost-effective prescribing
  - Discuss the ethical and legal framework governing safe-drug prescribing in Saudi Arabia
2. *Sepsis, systemic inflammatory response syndrome (SIRS), disseminated intravascular coagulation (DIC). At the end of the unit, fellows should be able to:*
- Explain the pathogenesis of sepsis, SIRS, and DIC.
  - Identify patient-related and non-related predisposing factors of sepsis, SIRS, and DIC
  - Recognize a patient at risk of developing sepsis, SIRS, or DIC
  - Describe the complications of sepsis, SIRS, and DIC
  - Apply the principles of management to patients with sepsis, SIRS, and DIC
  - Describe the prognosis of sepsis, SIRS, and DIC
3. *Blood transfusion. At the end of the unit, fellows should be able to:*
- Review the different components of blood products available for transfusion
  - Recognize the indications and contraindications of blood product transfusion
  - Discuss the benefits, risks, and alternatives to transfusion
  - Undertake consent for specific blood product transfusions
  - Perform steps necessary for safe transfusion
  - Develop understanding of special precautions and procedures necessary during massive transfusion
  - Recognize transfusion associated complications and provide immediate management
4. *Management of fluid in the hospitalized patient. At the end of the unit, fellows should be able to:*
- Review physiological basis of water balance in the body
  - Assess a patient for his/her hydration status
  - Recognize a patient with over- and under-hydration
  - Order fluid therapy (oral as well as intravenous) for a hospitalized patient
  - Monitor fluid status and response to therapy through history, physical examination, and selected laboratory investigations
5. *Management of acid-base electrolyte imbalances. At the end of the unit, fellows should be able to:*
- Review physiological basis of electrolyte- and acid-based balance in the body
  - Identify diseases and conditions that are likely to cause or be associated with acid/base and electrolyte imbalances
  - Correct electrolyte and acid-base imbalances
  - Perform careful calculations, checks, and other safety measures while correcting acid-base and electrolyte imbalances
  - Monitor response to therapy through taking a history, physical examination, and selected laboratory investigations

## F2 competencies

1. *Acute pain management: At the end of the unit, fellows should be able to:*
  - Review the physiological basis of pain perception
  - Proactively identify patients who might be in acute pain
  - Assess a patient with acute pain
  - Apply various pharmacological and non-pharmacological modalities to acute pain management
  - Provide adequate pain relief for uncomplicated patients' acute pain
2. *Patient advocacy. At the end of the unit, fellows should be able to:*
  - Define patient advocacy
  - Recognize patient advocacy as a core value governing medical practice
  - Describe the role of patient advocacy in patient care
  - Develop a positive attitude towards patient advocacy
  - Be a patient advocate in conflicting situations
  - Be familiar with local and national patient advocacy groups
3. *Ethical issues (treatment refusal, patient autonomy, etc.). At the end of the unit, fellows should be able to:*
  - Predict situations where a patient or family is likely to decline prescribed treatment
  - Describe the concept of (rational adult) in the context of autonomy and treatment refusal
  - Analyze key ethical, moral, and regulatory dilemmas in treatment refusal.
  - Recognize the importance of patient autonomy in the decision-making process
  - Counsel patients and families declining medical treatment in the patient's best interest
4. *Role of doctors in death and dying. At the end of the unit, fellows should be able to:*
  - Recognize the important role a doctor plays during the dying process
  - Provide emotional as well as physical care to a dying patient and family
  - Provide appropriate pain management to a dying patient
  - Refer patients to palliative care services

## Fellow Selected Topics

- 1) Trainees will be given choice to develop a list of topics on their own.
- 2) They can choose any topics relevant to their needs.
- 3) All these topics must be planned and cannot be random.
- 4) All the topics need to be approved by the local program committee.
- 5) Institution might work with trainees to determine the topics as well.

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## RECOMMENDED WORKSHOP/STIMULATION/INTERPRETATION SESSIONS

TOPICS
Ventilation
Resuscitation
Radiology interpretation
Electrocardiography interpretation and response
Critical airways management
Complete blood count interpretation
Pain management/sedation
Central line/long line
Fluids electrolyte management
Lumbar puncture and cerebrospinal fluid interpretation
Chest tube insertion

## EDUCATIONAL ACTIVITIES (add to appendix)

Morning Report	<ol style="list-style-type: none"> <li>1. Monitor patient care and review management decisions and their outcome</li> <li>2. Develop competence in briefly presenting all admitted patients in a scientific and informative way</li> <li>3. Develop confidence in presenting long cases in a systematic fashion</li> <li>4. Generate appropriate differential diagnoses and proper management plans</li> <li>5. Practice giving a concise yet informative follow-up for previously presented cases</li> </ol>
Morbidity and mortality	<ol style="list-style-type: none"> <li>1. Identify areas of improvement for relevant clinicians</li> <li>2. Prevent further errors that lead to morbidities or mortalities</li> <li>3. Modify physician's behavior and judgment based on previous experiences</li> <li>4. Identify the need for updated policies and guidelines that may affect patient care</li> </ol>
Grand rounds/staff or guest lectures	<ol style="list-style-type: none"> <li>1. Increase physicians' medical knowledge and skill and ultimately improve patient care</li> <li>2. Understand and apply current practice guidelines to neonatal care and its subspecialties</li> <li>3. Describe the latest advances in the field of neonatal research</li> <li>4. Identify and explain areas of controversy in the field of neonatal care.</li> </ol>
Case presentation	<ol style="list-style-type: none"> <li>1. Present a comprehensive history and physical examination with details pertinent to patients' problem.</li> <li>2. Formulate a list of all problems identified in the history and physical examination</li> <li>3. Develop a proper and informative differential diagnosis</li> <li>4. Formulate and discuss a treatment plan</li> <li>5. Improve case presentation skills by receiving feedback on presentation</li> </ol>
Journal club/evidence-based medicine	<ol style="list-style-type: none"> <li>1. Critically appraise the relevant literature</li> <li>2. Continue professional development</li> <li>3. Understand the basis of hypothesis testing</li> <li>4. Keep up with the literature</li> <li>5. Ensure that professional practice is evidence-based</li> <li>6. Learn and practice critical appraisal skills</li> <li>7. Provide enjoyable educational and social occasions</li> <li>8. Understand sources of bias</li> <li>9. Understand how study results can be used in clinical practice</li> <li>10. Understand the basic of diagnosis testing (prevalence, sensitivity, specificity, positive and negative predictive values, likelihood ratios)</li> </ol>

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## ASSESSMENT

### Purpose

The purpose of assessment during the Neonatal Perinatal Fellowship Program is to:

- Enhance learning by providing formative assessment, enabling trainees to receive immediate feedback, measure their own performance and identify areas for development.
- Drive learning and enhance the training process by clarifying what is required of trainees and motivating them to ensure they receive suitable training and experience.
- Provide robust, summative evidence that trainees are meeting the curriculum standards during the training program.
- Ensure trainees are acquiring competencies within the domains of good medical practice.
- Assess trainees' actual performance in the workplace.
- Ensure that trainees possess the essential underlying knowledge, skills, and attitude required for their specialty.
- Identify trainees who should be advised to consider a career change.

### General Principles

1. Judgment should be based on holistic profiling of the trainee rather than individual or instrumental profiling.
2. Assessment should be continuous in nature.
3. Assessment should be strongly linked to the curriculum.

Fellow evaluation and assessment throughout the program is carried out in accordance with the commission's training and examination rules and regulations.

### Annual continuous assessment

The general objective of the annual promotion assessment is to evaluate if the trainee has satisfactorily acquired the theoretical knowledge and clinical competencies that he/she should have acquired during the relevant years.

### The Components of Promotion Requirement for F1 Trainees:

The total score of promotion for first-year fellowship will be distributed as follows:

- Written examination
- Structured Oral Exam (SOE)
- Objective structured clinical examination (OSCE)
- In-training evaluation report (ITER)

### The Components of Continuous Assessment for F2 Trainees:

The continuous assessment for second-year fellowship consists of the following components:

- 1) In training evaluation report (ITER)
- 2) Successful research presentation
- 3) Logbook
- 4) Specific academic tasks

## Objectives

- An assessment of specialty knowledge
- Using theoretical data to determine the candidate's ability to think logically, to solve problems, to apply basic medical science to clinical problems, and to make judgments with valid comparisons

## Exam eligibility

As per SCFHS General Exam rules and Regulations (scfhs.org.sa)

## Exam rules

As per SCFHS General Exam rules and Regulations (scfhs.org.sa).

## Exam format

As per SCFHS General Exam rules and Regulations (scfhs.org.sa).

The questions will cover all aspects of Neonatal Perinatal Fellowship as shown in the blueprint (See appendix).

## Passing score

The passing score will be in accordance with the commission's training and examination rules and regulations. There will be no negative marking as per the rules of SCFHS.

## Final written examination

### Objectives

- Determine that the ability of the candidate to practice as independent specialist and provide consultation in the general domain of his/her specialty for other healthcare professionals or other bodies that may seek assistance and advice.
- Ensure that the candidate has the necessary clinical competencies relevant to his/her specialty including but not limited to history taking, physical examination, documentation, procedural skills, communication skills, bioethics, diagnosis, management, investigation and data interpretation.
- All competencies contained within the specialty core curriculum are subject to inclusion in the examination.

### Eligibility

The following exam rules can be subjected to modifications based on SCFHS bylaws and executive policies (check the updated version on SCFHS website).

- 1) Successful completion of the required period of fellowship training
- 2) Successful completion of the components of the continuous assessment for F2
- 3) Training completion certificate, issued by the local supervisory committee based on a satisfactory final in-training evaluation report (FITER) and any other related requirements assigned by scientific boards (e.g., research)



- 4) Completion and presentation of a scholarly research project relevant to Neonatal Perinatal medicine
- 5) Valid Neonatal Resuscitation Program certificate (NRP)
- 6) Certificate of completion of universal topics
- 7) Any candidate who misses three months of training during the whole fellowship is allowed to sit for the exams (written and clinical)
- 8) Candidates must register for the examination at least one month before the exam date

### **General rules**

As per SCFHS General Exam rules and Regulations ([scfhs.org.sa](http://scfhs.org.sa))

### **Exam format**

- As per SCFHS General Exam rules and Regulations ([scfhs.org.sa](http://scfhs.org.sa))
- The stations as shown in the Final Clinical Exam Blueprint (See appendix)

### **Passing score**

As per SCFHS General Exam rules and Regulations ([scfhs.org.sa](http://scfhs.org.sa))

## **Final Clinical Examination**

The final specialty clinical examination consists of:

- 1) Objective structured clinical examination (OSCE)
- 2) Structured oral examination (SOE)

All competencies contained within the specialty core curriculum are subject to be included in the examination.

### **Exam Eligibility**

As per SCFHS General Exam rules and Regulations ([scfhs.org.sa](http://scfhs.org.sa))

- Passing the final written examination

### **General rules**

As per SCFHS General Exam rules and Regulations ([scfhs.org.sa](http://scfhs.org.sa))

### **Exam format**

- As per SCFHS General Exam rules and Regulations ([scfhs.org.sa](http://scfhs.org.sa))
- The stations as shown in the Final Clinical Exam Blueprint (See appendix)

### **Passing score**

As per SCFHS General Exam rules and Regulations ([scfhs.org.sa](http://scfhs.org.sa))

## **CERTIFICATION**

A certificate of training completion will only be issued upon the Fellow's successful completion of all program requirements. Candidates passing final written and clinical examinations are awarded the "SAUDI NEONATAL PERINATAL MEDICINE FELLOWSHIP" certificate.

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## EDUCATIONAL RESOURCES

### CONFERENCES OF INTEREST

- Canadian Pediatric Society
- Society for Pediatric Research (SPR)
- American Thoracic Society
- “Hot Topics” in Neonatology
- Mid-Atlantic Conference on Perinatal Research
- Australasian Perinatal Society
- American Academy of Pediatrics
- British Pediatric Society
- British Association of Perinatal Medicine
- European Society of Pediatric Research
- Saudi Neonatal Society conference
- Hot topics in Neonatology (Jeddah)

### PERINATAL/NEONATAL CARE WEBSITES

- Cochrane ([neonatal.cochrane.org/](http://neonatal.cochrane.org/) or [www.cochrane.org](http://www.cochrane.org))
- American Academy of Pediatrics ([www.aap.org](http://www.aap.org))
- Canadian Pediatric Society ([www.cps.ca](http://www.cps.ca))
- British Association of Perinatal Medicine ([www.bapm-London.org](http://www.bapm-London.org))
- Society of Obstetricians and Gynecologists of Canada ([www.sogc.medical.org](http://www.sogc.medical.org))
- College of Family Physicians of Canada ([www.cfpc.ca](http://www.cfpc.ca))
- Archives of Disease of Childhood ([www.archdischild.com](http://www.archdischild.com))
- Pediatrics ([www.pediatrics.org](http://www.pediatrics.org) or [www.guideline.gov](http://www.guideline.gov))
- Saudi Neonatology Society ([www.sns.med.sa](http://www.sns.med.sa))

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## RECOMMENDED TEXTBOOKS AND REFERENCES

### Textbooks

1. Avery Fanaroff and Richard Martin, Perinatal-neonatal disease and disease of the fetus & infant.
2. Gordon Avery, Pathophysiology of diseases of newborn
3. Rennie & Robertson's Textbook of Neonatology
4. Tricia Lacy Gomella, Neonatology: Management, Procedures, On-Call Problems, Diseases, Drugs
5. Camilia Martin and Dara Brodsky, Neonatology Review Book

### References

1. Saudi Commission for Health Specialties, Pediatric curriculum (<https://www.scfhs.org.sa/examinations/TrainingExams/DocLib/Pediatric%20new.pdf>) last access 19/5/2018
2. The Royal College of Physicians and Surgeons of Canada: Objectives of Training in the Subspecialty of Neonatal-Perinatal Medicine, 2014 (<http://www.royalcollege.ca/cs/groups/public/documents/document/y2vk/mdaw/~edisp/tztest3rcpsced000916.pdf>) last access 19/5/2018
3. The Royal College of Physicians and Surgeons of Canada: Subspecialty Training Requirements in Neonatal-Perinatal Medicine, 2014 (<http://www.royalcollege.ca/cs/groups/public/documents/document/y2vk/mdaw/~edisp/tztest3rcpsced000671.pdf>) last access 19/5/2018
4. WHO Report-Health Indicators, 2016 ([http://www.who.int/gho/publications/world\\_health\\_statistics/en/](http://www.who.int/gho/publications/world_health_statistics/en/)) last access 20/5/2018
5. Manual for the McMaster Neonatal Perinatal Fellowship Program, Division of Neonatology, Department of Pediatrics at McMaster Children's Hospital (<http://macneonatal.ca/>) last access 20/5/2018.
6. Avery's Diseases of the Newborn-10th Edition.
7. Fanaroff and Martin's Neonatal-Perinatal Medicine: Diseases of the Fetus and Infant, (Current Therapy in Neonatal-Perinatal Medicine) -10th Edition
8. Gordon Avery, Pathophysiology of disease of newborn.
9. Rennie & Robertson's Textbook of Neonatology-5th Edition.
10. Neonatology-7th Edition

## NEONATOLOGY RESEARCH EVALUATION FORM

Name:						
Hospital:						
Month:						
<b>Knowledge</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>N/A</b>
Appropriate literature review						
Interpretation of the literature						
<b>Research Skills</b>						
Technical skills						
Knowledge of ethical issues						
Knowledge of safety issues						
Ability to formulate hypotheses						
Ability to design appropriate methods						
Ability to interpret data						
<b>Work Habits</b>						
Attendance at relevant meetings						
Data storage and interim analysis						
Organization and time management						
<b>Data Presentation</b>						
Ability to collate data						
Ability to construct appropriate tables/ figures						
Ability to independently write an abstract						
Ability to independently write a manuscript						
Appropriate use of statistics						
<b>Personality</b>						
Effort/enthusiasm						
Ability to make independent decisions						
Ability to seek assistance when needed						
Reliability						
<b>Total</b>						
Fellow signature:					Date:	
Supervisor signature:					Date:	
Program Director signature:					Date:	
<b>Key for the grades: Unsatisfactory = 1; Needs Improvement = 2; Meets Expectations = 3; Above Expectations = 4; Excellent = 5; Not Applicable = N/A</b>						

## PRACTICE-BASED LEARNING

Practice-Based Learning	Objective	CanMEDS Competencies
Morning Report (optional)	<ul style="list-style-type: none"> <li>■ Educate all attending staff and review management decisions and their outcomes.</li> <li>■ Generate an appropriate differential diagnosis and proper management plan.</li> </ul>	Leader Medical Expert Professional Scholar
Morbidity and Mortality Report	<ul style="list-style-type: none"> <li>■ Identify areas of improvement for clinicians involved in case management.</li> <li>■ Prevent errors that lead to complications.</li> <li>■ Modify behavior and judgment based on previous experiences.</li> <li>■ Identify system issues that may affect the neonatal patient care such as outdated policies and changes in patient identification procedures, that may affect patient care</li> </ul>	Professional Leader Medical Experts
Grand Rounds/ Guest Speaker Lectures.	<ul style="list-style-type: none"> <li>■ Increase physician's medical knowledge and skills, and ultimately, improve patient care.</li> <li>■ Understand and apply current practice guidelines in the field of Neonatology.</li> <li>■ Describe the latest advances in the field of Neonatology and research.</li> <li>■ Identify and explain areas of controversy in the field of Neonatology.</li> </ul>	Medical Expert Professional
Case Presentation	<ul style="list-style-type: none"> <li>■ Formulate a list of all problems identified in the history and</li> <li>■ Develop a proper differential diagnosis for each problem.</li> <li>■ Formulate a diagnosis/treatment plan for each problem.</li> <li>■ Present a follow-up of the patient's case, in a focused, problem-based manner that includes pertinent new findings and diagnosis and treatment plans.</li> <li>■ Demonstrate a commitment to improving case presentation skills by regularly seeking feedback on presentations.</li> <li>■ Accurately and objectively record and present data.</li> </ul>	Medical Expert Scholar

<p>Journal Clubs, Critical Appraisal and Evidence Based Medicine</p>	<ul style="list-style-type: none"> <li>■ Promote continuing professional development.</li> <li>■ Stay up -to-date with the literature.</li> <li>■ Disseminate information on and develop arguments concerning.</li> <li>■ Ensure that professional practice is evidence based.</li> <li>■ Learn and practice critical appraisal skills.</li> <li>■ Provide an enjoyable educational and social occasion.</li> </ul>	<p>Medical Expert Scholar Health Advocate</p>
<p>Joint Specialty Meetings.</p>	<ul style="list-style-type: none"> <li>■ Provide the knowledge, technical skills and experience necessary for Neonatal Fellows to interpret and correlate clinical finding and laboratory data such as radiological imaging with pathological changes.</li> <li>■ Promote effective communication and sharing of expertise with peers and colleagues.</li> <li>■ Promote the development of investigative skills to better understand pathologic processes as they apply to both individual patients and the general patient population.</li> <li>■ Promote the acquisition of knowledge, provide experience in laboratory direction and management, and encourage Fellows to assume a leadership role in the education of other physicians and allied health professionals.</li> </ul>	<p>Medical Expert Communicator Collaborator Leader</p>

## WORK-BASED LEARNING

Work Based Learning	Objectives	CanMEDs
Daily Round Based Learning	<ul style="list-style-type: none"> <li>■ Present a focused history and physical examination finding to the rounding team.</li> <li>■ Document historical and physical examination findings according to accepted formats including a complete written database and problem list.</li> <li>■ Develop a patient management plan in consultation with others</li> </ul>	Medical Expert Communicator Health Advocate Professional
On-Call Duty Based Learning	<ul style="list-style-type: none"> <li>■ Elicit a comprehensive history and perform a complete physical examination on admission, clearly write the Neonatal patient's assessment and differential diagnosis of medical problems, and initiate the plan of management.</li> <li>■ Discuss the plan of management, including investigations and the treatment plan with the seniors.</li> <li>■ Communicate the plan to the nurse charged with patient's care.</li> <li>■ Perform the basic procedures necessary for diagnosis and management.</li> <li>■ Attend to consultations within and outside the department, including emergency consultations and other specialties.</li> </ul>	Medical Expert Scholar Health Advocate Professional



<p>Clinic Based Learning</p>	<ul style="list-style-type: none"> <li>■ Elicit a focused history and physical examination under the supervision of the consultant</li> <li>■ Present briefly the clinical finding to the attending consultant</li> <li>■ Discuss the differential diagnosis and the management plan with the attending consultant</li> <li>■ Discuss with the consultant the need for specialized procedures.</li> <li>■ Write the patient's assessment and differential diagnosis and the plan of management.</li> <li>■ Supervise the resident's notes, orders, and management, interpret and discuss the laboratory results with residents.</li> </ul>	<p>Medical Expert Communicator</p>
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### Self-Directed Learning

Item	Objectives	CanMEDs
<p>Self-Directed Learning</p>	<ul style="list-style-type: none"> <li>■ Maintenance of a personal portfolio (self-assessment, reflective learning, personal development plan).</li> <li>■ Achieving personal learning goals beyond the essential, core curriculum.</li> <li>■ Reading, including web-based material.</li> <li>■ Reading journals.</li> <li>■ Auditing and conducting research projects.</li> <li>■ Attending national and international conferences.</li> </ul>	<p>Professional Medical Expert Scholar</p>

## WRITTEN EXAM BLUEPRINT

No.	Sections	Percentage (%)
1	Respiratory	14
2	Cardiovascular	8
3	Maternal fatal medicine +asphyxia	9
4	Genetics	7
5	Nutrition	7
6	Endocrine	7
7	Renal	5
8	Gastroenterology + Eye + Ear + Skin	7
9	Immunology+ Infectious	8
10	Hematology + Bilirubin	5
11	Neurology + Neurodevelopment	10
12	Statistic + Pharmacology	8
13	Research, Ethics and Professionalism and Patient Safety	5
<b>Total</b>		<b>100%</b>

**Note:**

Blueprint distributions of the examination may differ up to +/-3% in each category

## FINAL CLINICAL EXAM BLUEPRINT

		DIMENSIONS OF CARE				# Stations
		Health Promotion & Illness Prevention 1±1 Station(s)	Acute 5±1 Station(s)	Chronic 5±1 Station(s)	Psycho-social Aspects 1±1 Station(s)	
<b>DOMAINS FOR INTEGRATED CLINICAL ENCOUNTER</b>	<b>Patient Care</b> 8±1 Station(s)		<b>1</b>	<b>2</b>		<b>3</b>
	<b>Patient Safety &amp; Procedural Skills</b> 1±1 Station(s)					
	<b>Communication, Interpersonal Skills &amp; Professional Behaviors</b> 2±1 Station(s)		<b>2</b>	<b>1</b>		<b>3</b>
	<b>Total Stations</b>		<b>3</b>	<b>3</b>		<b>6</b>

## VI Definitions

Dimensions of Care	Focus of care for the patient, family, community, and/or population
<b>Health Promotion &amp; Illness Prevention</b>	The process of enabling people to increase control over their health & its determinants, & thereby improve their health. Illness prevention covers measures not only to prevent the occurrence of illness such as risk factor reduction but also arrest its progress & reduce its consequences once established. This includes but is not limited to screening, periodic health exam, health maintenance, patient education & advocacy, & community & population health.
<b>Acute</b>	Brief episode of illness, within the time span defined by initial presentation through to transition of care. This dimension includes but is not limited to urgent, emergent, & life-threatening conditions, new conditions, & exacerbation of underlying conditions.
<b>Chronic</b>	Illness of long duration that includes but is not limited to illnesses with slow progression.
<b>Psychosocial Aspects</b>	Presentations rooted in the social & psychological determinants of health that include but are not limited to life challenges, income, culture, & the impact of the patient's social & physical environment.

Domains	Reflects the scope of practice & behaviors of a practicing clinician
<b>Patient Care</b>	Exploration of illness & disease through gathering, interpreting & synthesizing relevant information that includes but is not limited to history taking, physical examination & investigation. Management is a process that includes but is not limited to generating, planning, organizing care in collaboration with patients, families, communities, populations, & health care professionals (e.g. finding common ground, agreeing on problems & goals of care, time & resource management, roles to arrive at mutual decisions for treatment)
<b>Patient Safety &amp; Procedural Skills</b>	Patient safety emphasizes the reporting, analysis, and prevention of medical error that often leads to adverse healthcare events. Procedural skills encompass the areas of clinical care that require physical and practical skills of the clinician integrated with other clinical competencies in order to accomplish a specific and well characterized technical task or procedure.

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<b>Communication &amp; Interpersonal Skills</b>	Interactions with patients, families, caregivers, other professionals, communities, & populations. Elements include but are not limited to active listening, relationship development, education, verbal, non-verbal & written communication (e.g. patient centered interview, disclosure of error, informed consent).
<b>Professional Behaviors</b>	Attitudes, knowledge, and skills based on clinical &/or medical administrative competence, ethics, societal, & legal duties resulting in the wise application of behaviors that demonstrate a commitment to excellence, respect, integrity, accountability & altruism (e.g. self-awareness, reflection, life-long learning, scholarly habits, & physician health for sustainable practice).