The Arab League
Council of Arab Health Ministers
The Arab Board of Health Specializations
General Secretariat

جامعة الدول العربية
مجلس وزراء الصحة العرب
المجلس العربي للاختصاصات الصحية
الأمانة العامة

المجلس العلمي لطب الأطفال

Scientific Council of Pediatrics

دليل اختصاص العناية المركزة عند حديثي الولادة

Guidebook of Pediatrics Neonatology

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اختصاص العناية المركزة عند الوليد (حديثي الولادة)
Arab Board of Health Specializations
Scientific Council of Pediatrics
Fellowship of Neonatology

Program Requirements for Fellowship Education in Neonatology

A. Scope of Training

1. Neonatal-perinatal medicine programs provide fellows with the background to understand the physiology and altered structure and function of the fetus and the neonate, and to diagnose and manage problems of the neonate.

2. The program must emphasize the fundamentals of clinical diagnosis and management of problems seen in the continuum of development from the prenatal through the intrapartum and neonatal periods, including assessment of outcomes.

B. Institutions

An accredited program in neonatal-perinatal medicine should preferably be affiliated with a residency program in obstetrics and gynecology accredited by the ABHS. The obstetrics and gynecology service must have Arab or American board-certified or other recognized board certified maternal-fetal medicine specialists or equivalent degrees.

c. Program Personnel and Resources

1. Faculty

a. An accredited program must have at least three full-time neonatologists actively contributing sufficient time and effort to the educational program to fulfill the supervisory, teaching, and mentoring requirements of the program.

b. The program must include the full range of pediatric subspecialists necessary for teaching and consultation. In addition, appropriate consultants must be available in related disciplines, including: a pediatric neurologist, a geneticist, a consultant skilled in neurodevelopment, and a pediatric radiologist.

c. Each program must have a full range of surgical subspecialists with experience in pediatrics necessary for teaching and consultation, including consultant faculty in: pediatric surgery, neurosurgery, ophthalmology, orthopaedic surgery, otolaryngology, urology, and cardiothoracic surgery.

d. For every fellow recruited at least 2 consultant neonatologists should be employed full time for the whole period of training.

D. Other Program Personnel

The following professional staff, skilled in the care of critically ill and/or premature neonates, are essential: nurses, respiratory therapists, pharmacists, nutritionists skilled in the management of both enteral and parenteral nutrition, therapists skilled in evaluating feeding difficulties initially or in follow up, medical social workers skilled in management of families in crisis and end-of-life care, specialists in physical and occupational therapy applied in a developmentally appropriate way, and specialists in the assessment of hearing

E. Resources

1. A specially-designated neonatal intensive care unit (NICU) must be located in the primary teaching site. Facilities and equipment in that unit must meet the generally accepted standards of modem intensive care units, and appropriate laboratory services must be available 24 hours a day. The facilities and resources must include: portable x-ray, ultrasound imaging, ECG, neonatal echo cardiography, but EEG services available in the hospital.

2. The perinatal service must have facilities and equipment which meet the generally accepted standards for high-risk newborn resuscitation. The unit should have a minimum number of 25 NICU and SCBU beds. The unit must have:

    a) Facilties for ventilation with a minimum number of6 ventilators utilized full time.
    b) Facilities for various modes of ventilation like high frequency ventilation, CPAP etc
    c) Facilities for phototherapy, exchange transfusion
    d) Availability of blood gas analysis within the unit
    e) Facilities for the preparation of parenteral nutrition

3. The primary teaching site must meet the generally-accepted standards for modern laboratories and services needed for management of high-risk pregnancies and critically ill neonates. These must include:

    a) Microchemistry and hematology laboratories;
    b) Blood gas analysis;
    c) Perinatal diagnostic laboratory; such as aminocentesis and cytogenetics
    d) Pathology services, including those for evaluation of placental pathology,
    e) Diagnostic bacteriology and virology laboratories;
    f) Blood bank; and,
    g) Accessible CT and MRI facilities.

4. The training sites must also have access to the following within a reasonable pericxl of time:

   a) Screening laboratory for inborn errors of metabolism;
   b) Clinical toxicology laboratory,
   c) Nuclear medicine facilities;
   d) Cytogenetics laboratory; and,
   e) Audiology services.

5. The program must provide the patient care experiences necessary for the fellows to acquire skill in delivery room stabilization and resuscitation of critically ill neonates. To accomplish this, there must be a sufficient number and variety of high-risk obstetrical patients to ensure that the fellows become knowledgeable in identifying high-risk pregnancies and evaluating fetal well-being and maturation.

6. A sufficient number of discharged infants must be available in a NICU Follow-up Clinic to assure appropriate outpatient experience for each fellow. The clinic must have staff with expertise in performing developmental assessments, as well as skilled neonatal or pediatric faculty as teachers. These experiences should enable fellows to understand the relationship between neonatal illnesses and later health and development, and to become aware of the socioeconomic impact and psychosocial stress that such infants may place on a family.

F. Educational Program

1. Patient Care

a) Fellows in neonatal-perinatal medicine must be directly involved in the care of critically ill surgical patients in order to acquire the requisite specialty-specific knowledge and skills to attain competence in the evaluation, diagnosis and pre/post-operative management of such patients. To meet these goals, the coordination of care and collegial relationships between pediatric surgeons, neonatologists, and critical care intensivists concerning the management of medical problems in these complex critically ill patients are essential.

b) Fellows must have experience and instruction adequate for them to manage critically ill neonates. In addition to the general principles of critical care, this should include, but not be limited to, techniques of neonatal resuscitation, venous and arterial access, evacuation of air leaks, endotracheal intubation, preparation for transport, ventilatory support, continuous monitoring, temperature control and nutritional support.

c) Fellows must have instruction in the psychosocial implications of disorders of the fetus, neonate, and young infant, as well as in the family dynamics surrounding the birth and care of a sick neonate. The fellows should have experience in patient consultation, communication with referring physicians, and in organizing transport of neonates within the framework of an integrated regional system with different levels of perinatal care. They should also receive instruction about and participate in the education of physicians and other healthcare professionals regarding emerging issues and factors impacting regional perinatal morbidity and mortality.

d) Fellows must learn to identify the high-risk pregnancy, and must become familiar with the methods used to evaluate fetal well-being and maturation. Fellows must become familiar with factors that may compromise the fetus during the intrapartum period, and recognize the signs of fetal distress. In addition, fellows must participate in the follow-up of high - risk neonates.

e) Programs must teach fellows to be effective consultants in neonatal-perinatal medicine. All fellows must receive instruction that prepares them to conduct and interpret relevant scholarly efforts in neonatal-perinatal medicine, to teach neonatal-perinatal medicine effectively, and to be effective administrators and leaders in the field.

f) To become skilled in diagnosis and management, fellows must be exposed to critically ill neonates with diverse medical and surgical conditions. Fellows must participate in the care of a sufficient number of neonates who require ventilatory assistance in order to become skilled in their management; fellows should also participate in the care of neonates requiring major surgery. In addition, fellows must acquire knowledge of, and participate in, the care of neonates requiring cardiac surgical procedures (and their postoperative complications).

g) A neonatal database of all patient admissions, diagnoses, and outcomes must be used for fellow education. Programs should provide fellows with knowledge about the tabulation and evaluation of an institutional database. Exposure to a regional or national fetal and neonatal morbidity and mortality database is encouraged. There should also be instruction and experience in techniques of collation and critical interpretation of data pertaining to immediate outcome and sequelae of various diseases, for which the presence of a statistician is suggested. This experience should be closely related to the evaluations of various mooalities of therapy used in these disorders.

2. Medical Knowledge

a) The program must provide fellows with instruction in related basic sciences. Seminars, conferences, and courses must be offered in the basic disciplines related to pregnancy, the fetus, and the neonate. This should include maternal physiologica~ biochemical, and pharmacological influences on the fetus; fetal physiology; fetal development; placental function (placental circulation, gas exchange, growth); physiological and biochemical adaptation to birth; cellular, molecular, and developmental biology and pathology relevant to diseases of the neonate; psychology of pregnancy and maternal-infant interaction; breast feeding and lactation; growth and nutrition; and genetics.

b) Fellows should also participate in regularly-scheduled multidisciplinary conferences, such as case conferences and those that review perinatal mortality and morbidity.

3. Research

Effective training is supported in a milieu in which scientists with a broad variety of interests and backgrounds come together to share ideas and provide one-on-one mentoring of junior physician-scientists. These support traditional basic and clinical
research education, as well as training in health care policy and medical informatics in the context of a medical research career. The aim of mentored research is to provide fellows with the background and qualifications for successful independent research. During the first year, discussions with faculty and other advisors lead to an individualized research training plan, which depends upon the fellow's academic and professional goals. Outstanding physicians, depending on their aspirations and interests, can make significant contributions to health care policy, medical ethics or medical informatics in the context of a medical research career.

The clinical research training program is designed to provide young clinical scientists with the tools and skills needed to perform iJUlovative clinical research, translating and testing basic science discoveries in the clinical arena.
The tools include mentorship and instruction with:

1. Clinical Trial Design
2. Statistical Analysis
3. Clinical Research Ethics
4. Data Management
5. Protocol Development
6. Institutional Review Board Submission
7. Consent Form Design
8. Budgeting for Trials
9. Manuscript and Abstract Preparation
10. Presentation of Research at National Meetings

The goals of the Clinical Research Program are to advance medical care and improve patient survival and quality of life by developing and directing multi-centered clinical trials in pediatric therapeutics, train pediatricians in clinical research, and, through mentoring, help them develop successful research careers.

A broad range of lectures & seminar series should be available to more than meet Board Core Curriculum requirements including Curriculum Design; Teaching Skills; Comprehensive Introduction to Clinical Research; Molecular Biology Techniques; Introduction to Evidence-Based Medicine, Grant Writing Seminar, and Medical Ethics, and law.

G. Neonatal Fellowship program Curriculum

I. **Eligibility criteria**

1. A medical degree (MBBS or MD or equivalent) from a recognized university.
2. Successful completion of Arab Board of Pediatrics or equivalent (eg: American Board of Pediatrics, MRCPCH, Canadian fellowship, Australian and New Zealand Fellowship, etc).
3. Personal interview.
4. Provision of recommendation letters from 3 consultant pediatricians or neonatologists confirming the suitability of the candidate for acceptance as a Trainee neonatologist in the program.
5. Letter of commitment to abide by the rules and regulations of the Arab Board of Pediatrics.
6. Registration with the Arab Board of Pediatrics as a trainee fellow of neonatology.
7. Payment of registration fee according to Arab Board fees.

II. Program of clinical service over the three year period:

Rotation / Week	Total fellowship	First Year	Second Year	Third Year
Acute Intensive care/ intermediate Care	94	38	32	32
Neonatology Follow up Clinic	12	4	4	4
Feto-Maternal Medicine	6	2	2	2
Pediatric/Cardiac ICU	4		2	2
Research	8	0	4	4
Electives	12	4	4	4
Holidays	12	4	4	4
Total	156	52	52	52

On call duties: at least one on call duty per week plus two nights weekend duty per month.

Details of the program

During the first year of fellowship, each fellow is exposed to delivery room resuscitation, ventilatory management, and intensive care of sick neonates, as well as the convalescent care of recovering infants. In addition, the fellow jointly manages neonatal surgical patients and patients referred to the hospital from outside pediatricians, perinatologists and obstetricians. These skills are enhanced as the fellow becomes more independent during the second and third years.

Excellent clinical care depends on a broad knowledge of the underlying physiology, pathophysiology, and clinical literature. Weekly lectures, journal clubs, clinical conferences, core readings, and discussions help build a broad based fund of knowledge in neonatal medicine. During clinical training, the fellow learns the leadership skills needed to supervise a busy intensive care unit with house staff, and respiratory care specialists. In addition, the fellow participates in unit administration which includes problem identification and solutions.

All pediatric medical and surgical sub specialties should be available. During the clinical rotations, fellows should provide leadership and oversight of the bedside care team under the direct guidance of a faculty member. The fellows should assist in the training of more junior residents and interns during their ICN rotations, and should provide consultations for prenatal visits arranged with obstetrical colleagues.

All fellows should participate in the administrative activities of the division. As fellows become more senior in training, they are given more clinical leadership responsibilities. The first and second year fellows should coordinate joint conferences and should lead discussions at patient care conferences. The senior fellows should attend the weekly executive administrative meeting in the Unit and should actively participate in the development of health care plans and problem solving activities. Approximately 1-2 months of the senior year are spent as "junior attending" on resident team. During that time the fellow should make rounds with the team and later with a

faculty member.

Fellows attend the multidisciplinary neonatal follow-up clinic (Special Infant Care Clinic) during their fellowship. During this clinical experience, fellows become familiar with the expected outcomes of various groups of high risk infants. In addition, they learn to determine whether a child's neurologic and/or developmental outcome is consistent with his/her neonatal course and whether further evaluations are indicated (i.e. neuro imaging studies, neurology consultations, genetics and metabolism consultations, etc.). Each fellow learns to perform a detailed neurologic examination of an infant through 2 years of age, including the careful evaluation of muscle tone and primitive reflexes. One of the goals of the training experience is learning to distinguish transient neurologic abnormalities seen commonly in premature and sick full term infants from the early precursors of cerebral palsy. Fellows are taught how to discuss the diagnosis of cerebral palsy and developmental disabilities with families. They also become familiar with various types of intervention services and their indications. Board certified physical therapists, occupational therapists, speech therapists and psychologists work hand in hand with physicians and assist in determining the need for interventional services as well as provide parent education.

Early in training, and throughout the fellowship, trainees are given the opportunity to identify infants in the NICU who they would like to follow in clinic. The distribution of patients should include extremely low birth weight infants, infants with known intracranial injury and full term infants with respiratory failure.

This three year fellowship track is designed to provide excellent clinical training in the acute and convalescent care of premature and sick full term infants as well as the medical and neuro developmental follow-up care required for these infants post-discharge. The fellow will receive comprehensive training in the methods for conducting neuro developmental follow-up, and other outcome research.

The requirements of this fellowship track will include:

1. 15 months of clinical service in the ICN (standard fellowship requirement) with additional clinical service time (5 months) in transitional care nurseries.
2. Weekly participation in the Special Infant Care Clinic including following a designated cohort of infants (both extremely low birth weight and critically ill full term infants) over 2-3 years. Skills to be learned in clinic will include:
   - **a.** To be able to perform a detailed neurologic assessment of an infant and young child.
   - **b.** To be able to manage ongoing medical problems of high risk infants (e.g. chronic lung disease, gastroesophageal reflux, growth and feeding problems).
   - **c.** To gain familiarity with the expected neuro developmental outcome of various neonatal problems.
   - **d.** To be able to determine whether the neurologic and developmental abnormalities of an infant are consistent with the neonatal course, and if not, what further diagnostic evaluations or referrals are indicated.

e. To be able to distinguish the transient neurologic abnormalities of premature and sick full-term infants from the early precursors of cerebral palsy.

f. To understand the indications and interpretation of the various developmental assessment tools used by members of the developmental team.

g. To gain familiarity with the various intervention services available for infants and young children with developmental disabilities and how to help families access these services.

h. To develop experience in discussing unfavorable prognosis and outcome with parents in a supportive and compassionate way.

3. Weekly participation in Developmental Rounds in the NICU.

4. Participation in providing medical care of infants rehospitalized soon after discharge with exacerbation of neonatal problems.

5. Elective months in the following areas:

a) Neuroimaging (indications and interpretation)
b) Neonatal neurology
c) Rehabilitation CP clinic
d) Physical/occupational therapy/audiology and hearing
e) Speech/feeding disorders
f) Fetal-maternal medicine
g) Cardiac Intensive Care

The neonatology fellows will also have a rotation in the Cardiac Intensive Care Unit. This rotation is primarily to provide the experience and oversight of the care of postoperative cardiac surgery and ECMO patients. During this rotation, the fellow supervises and manages care of pediatric intensive care patients under the direction of senior Cardiac/ NICU or PICU faculty. Fellows further their central vascular access skills and ventilatory management of neonates with cardiac disorders.

During the fellowship years, there should be a rotation within the Division of MaternalFetal Medicine in order to gain expertise in prenatal diagnosis, diagnostic ultrasound, prenatal genetic counseling, and multi-disciplinary consultations for complex cases. There should be a bi- weekly case conference held between Neonatal Medicine, MaternalFetal Medicine, and Obstetric Anesthesiology to discuss upcoming cases and management. In addition, fellows should attend a monthly fetal board case review and are responsible for perinatal counseling under the direction of the neonatal and obstetric faculty staff member.

Throughout the training program the fellow attends and helps (with faculty supervision) direct daily bedside teaching-and work-rounds while on clinical service. He/she attends weekly fellows' conferences where topics should be prepared and presented by the faculty, visiting guest speakers or the fellows themselves. The fellows also should attend the morning case conferences at least two times a week, where they should present clinical cases and their management for review by faculty and for academic and research associated discourse. The fellows should also participate in the monthly journal club meetings; neonatal-perinatal statistics rounds and high risk OB conferences; bioethics and discharge planning conferences; and perinatal high risk clinics as well as follow-up clinics for premature infants under 1500 grams. In addition, the fellows should attend specific courses on research design and protocols and the writing of research papers during their training.

III Assessment of the trainee

A) On-site evaluation:

Demonstration of basic clinical competency in NICU at each site, as well as in follow-up clinic should be achieved during the first year. Written evaluation score should be in the satisfactory range. During the second year, refinement should occur such that by the third year, fellows should be able to demonstrate competence at the level of a new junior consultant and written evaluation score should be above satisfactory.

Evaluation should include the following:

1) Patient care
2) Medical Knowledge
3) Interpersonal communication skills
4) Professionalism
5) Practice based learning
6) System based practice

In addition, annual written examinations should be conducted at the site, based on which decision is made to promote the fellow from one year to the next.

B) Fellowship Examination Requirement:

1. Submission of a letter from the program director stating:
    a. Overall evaluation no less than good (3).
    b. Lack of any documented misconduct or unethical behavior.
2. Submission of the logbook signed by the program director.
3. Submission of the written research project (published paper, or abstract / poster and proof of work in progress)
4. Payment of the examination fees according to Arab Board fees.
5. The fellow may apply to sit for the part I exam at the end of the second year of training provided he submits a supporting letter from the program director.
6. Part I is a written examination made of two papers:
    a. Paper I composed of 100 single answer MCQ type questions
    b. Paper II composed of 50 case-based single answer MCQ type questions.
    c. Passing grade is a cumulative of 70%.
    d. Each fellow has 3 attempts at the written exam.
    e. In case of failure in the third attempt, a candidate has to repeat one year of fellowship training to become eligible to retake Part I exam.
7. Part II is a clinical oral examination composed of8 to 10 stations of 10 minutes each:
    a. Four to five stations are composed of cases with illustrations, including one communication skills station
    b. Four to five stations are case discussions with or without an actual patient. Two of those stations are considered essential.
    c. Passing grade is 60% and above on all stations combined AND no less than 60% in each of the essential stations.
8. There is no limit to the number of attempts at the Part II exam.

C) Certification

Fellowship of the Arab Board of Pediatrics and Neonatology (FABPN) is awarded after successful completion of Part II examination.