

# POLICY STATEMENT\*

## EDUCATIONAL OBJECTIVES FOR THE TRAINING OF OBSTETRICAL AND GYNAECOLOGICAL SONOLOGISTS

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*This document has been reviewed and approved by the Diagnostic Imaging Committee of the Society of Obstetricians and Gynaecologists of Canada and was approved by its Council.*

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*For non-obstetrician/gynaecologists, a minimum in-  
training rotation in Obstetrics and Gynaecology totalling six  
months should be a prerequisite.*

### INTRODUCTION

The trainee should have a basic knowledge of the following areas: embryology, teratology, genetics, physiology and pathophysiology of pregnancy.

The training programme would expect the candidate to understand the full range of diagnostic capabilities and limitations of ultrasound. The practical training requirements are designed to ensure that candidates develop sufficient skills to enable them to detect major pregnancy and fetal abnormalities, to triage for gynaecologic emergencies, and to make appropriate referral to a tertiary centre for further investigations.

### GENERAL

1. To understand the principles and physics of ultrasound
  - definition of ultrasound
  - generation of ultrasound (piezoelectric phenomenon)
  - propagation and reflection of ultrasound
  - penetration and resolution of ultrasound
  - the ultrasound display: B Mode  
M Mode

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- methods for image enhancement (e.g. frame rate, transducer design and focusing)
- Doppler ultrasound principles
- artefacts and impediments
  - reverberation
  - edge effects
  - shadowing
  - enhancement
- 2. To understand the safety of ultrasound
- 3. To understand ultrasound instrumentation (e.g. grey scale, time gain compensation, dynamic range, dynamic focus, application of various transducers)
 

To be able to select the appropriate ultrasound system and the transabdominal and endocavitary transducers required for imaging of obstetric or gynaecologic structures based on size of the patient and objective of the examination
- 4. Measuring systems
  - linear, circumference, area, and volume
  - Doppler ultrasound—flow, velocity, spectrum analysis
- 5. Image recording, storage and analysis

#### GYNÆCOLOGY

Be familiar with the images of the normal female pelvis including:

- normal size, shape, and contour of the uterus
- normal endometrial appearance and changes with the menstrual cycle
- normal ovarian size (re: age), and appearance and changes in menstrual cycle
- significance of free fluid in the pelvis
- differential diagnosis of adnexal masses
- assessment of peritoneal fluid volume
- placement of intra-uterine contraceptive devices
- identification of ectopic pregnancy

#### OBSTETRICS—KNOWLEDGE OF THE THEORY AND PRINCIPLES OF:

- a) First trimester ultrasound
  - differentiation of intra- from extra-uterine pregnancy
  - ultrasound features of normal early pregnancy and placentation including multiple pregnancy
  - principles and accuracy of dating based on first trimester scan
  - uterus and adnexae in the first trimester
  - relevance of transvaginal scanning

- early and late embryonic development; sonoembryology
- b) Second trimester and third trimester ultrasound
  - principles and accuracy of dating
  - organ embryology
  - pathophysiology of common fetal abnormalities
    - neural tube defect
    - ventriculomegaly
    - fetal hydrops
    - poly- and oligohydramnios
    - abdominal wall defects
    - amniotic fluid physiology
    - placental anatomy and disease
    - assessment of cervix
    - pathophysiology and characteristics of uterine and extra-uterine abnormalities (e.g. fibroids, extra-uterine masses)
    - multifetal gestation: determining chorionicity and differential diagnosis of discrepant size
    - assessment of fetal well-being
    - biophysical profile and Doppler
    - evaluation of fetal growth disturbance
    - symmetrical intra-uterine growth restriction (IUGR) and asymmetrical IUGR

- b) The trainee should be able to recognize the following normal fetal anatomical features by abdominal ultrasound from 16 weeks onwards:
  - shape of the skull, nuchal skinfold
  - brain: ventricles and cerebellum, choroid plexus, cisterna magna, cavum pallidum, corpus callosum
  - facial profile
  - spine: longitudinal and transverse and coronal views—identify normal and abnormal components
  - heart: rate and rhythm, size and position, four chamber view. Identify the right and left outflow tracts
  - morphology of the lungs
  - shape of the trunk
  - abdomen: diaphragm, stomach, liver, kidneys, abdominal wall with cord insertion site
  - bladder
  - genitalia
  - limbs: femur, tibia, fibula, humerus, radius and ulna, feet and toes, hands and fingers
  - multiple pregnancy: monochorionic and dichorionic, twin-twin transfusion syndrome
  - amount of amniotic fluid
  - placental morphology



- placental location
  - cord and number of vessels
  - c) Fetal biometry
    - crown rump length, biparietal diameter, atrium, cerebellum, cisterna magna, head circumference, abdominal circumference, femur length, interpretation of growth charts
  - d) Activity
- recognize and quantify:
- fetal movements
  - breathing movements

ultrasound procedures in both obstetrics and/or gynaecology annually to meet the requirements of Maintenance of Competence.

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## CERTIFICATION

Training should be carried out in a large accredited service which provides all aspects of obstetrical and gynaecological care. Interaction should be with trained supervisors on a one-to-one basis. It is also important that a reasonable number of anomalies be seen in a training centre, and that easy access to a perinatal unit be possible to facilitate adequate case discussion and follow-up. Supervision should be provided by a well-trained obstetrician/gynaecologist or radiologist. In specific instances, a teaching technologist could provide supervision. The unit should also be adequately equipped to allow:

- 1) hands-on experience for the trainee, and
- 2) for the trainees to work at their own speed without interfering with the flow of patients.

The proposed standards should be achievable **within a minimum six-month dedicated training period** in obstetrical and gynaecological ultrasound or during a comparable rotation undertaken during a residency programme.

The objective is for the candidate to have participated in **100 gynaecologic and early pregnancy scans** and to have participated in at least **200 obstetrical scans** covering the full spectrum of obstetrical conditions.

By the end of the training period, it is required that the candidate obtain from the director of the ultrasound unit an attestation of the fulfilment of the objectives as described and that these be submitted for ratification by the appropriate provincial college.

## MAINTENANCE OF COMPETENCE

A minimum volume of 170 ultrasound procedures must be performed annually at each obstetrical or focused obstetrical and/or gynaecological site. Each participating physician must perform the minimum volume of 170