



**HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA
PROFESSIONAL BOARD FOR RADIOGRAPHY AND
CLINICAL TECHNOLOGY**

**GUIDELINES FOR THE SPECIAL BOARD EXAMINATION OF QUALIFIED DIAGNOSTIC
RADIOGRAPHERS IN THE CATEGORY: ULTRASOUND (SUPERVISED PRACTICE)**

A. INTRODUCTION

All individuals who practice any of the health care professions incorporated in the scope of the HPCSA are obligated by the Health Professions Act, 1974, to register with the HPCSA in the relevant category and field of practice. Failure to do so constitutes a criminal offence in respect of which disciplinary action may take place in terms of [Chapter IV](#) of the Act. In terms of the policy of the Professional Board for Radiography and Clinical Technology (PBRCT – herein after referred to as the Board), all qualified diagnostic radiographers who (i) have been performing ultrasound examinations during the period 1 January 1994 to 31 December 2019 without a qualification prescribed for registration in the category ultrasound and; (ii) who may have received informal education and training in a form of short courses, workshops, and or in-house training in ultrasound not prescribed by the Board for registration and that led them to perform ultrasound acts and procedures, are required to be assessed by undertaking a Special Board Examination to determine their eligibility to register with HPCSA in the category **Ultrasound (Supervised Practice)**.

This is a once-off amnesty offered by the Board to enable such diagnostic radiographers to be registered appropriately. Any diagnostic radiographer who **commenced** performing ultrasound after 31 December 2019 without the registerable ultrasound qualification, does not qualify for the Special Board Examination. Such diagnostic radiographers should **cease this practice with immediate effect.**

B. ELIGIBILITY CRITERIA

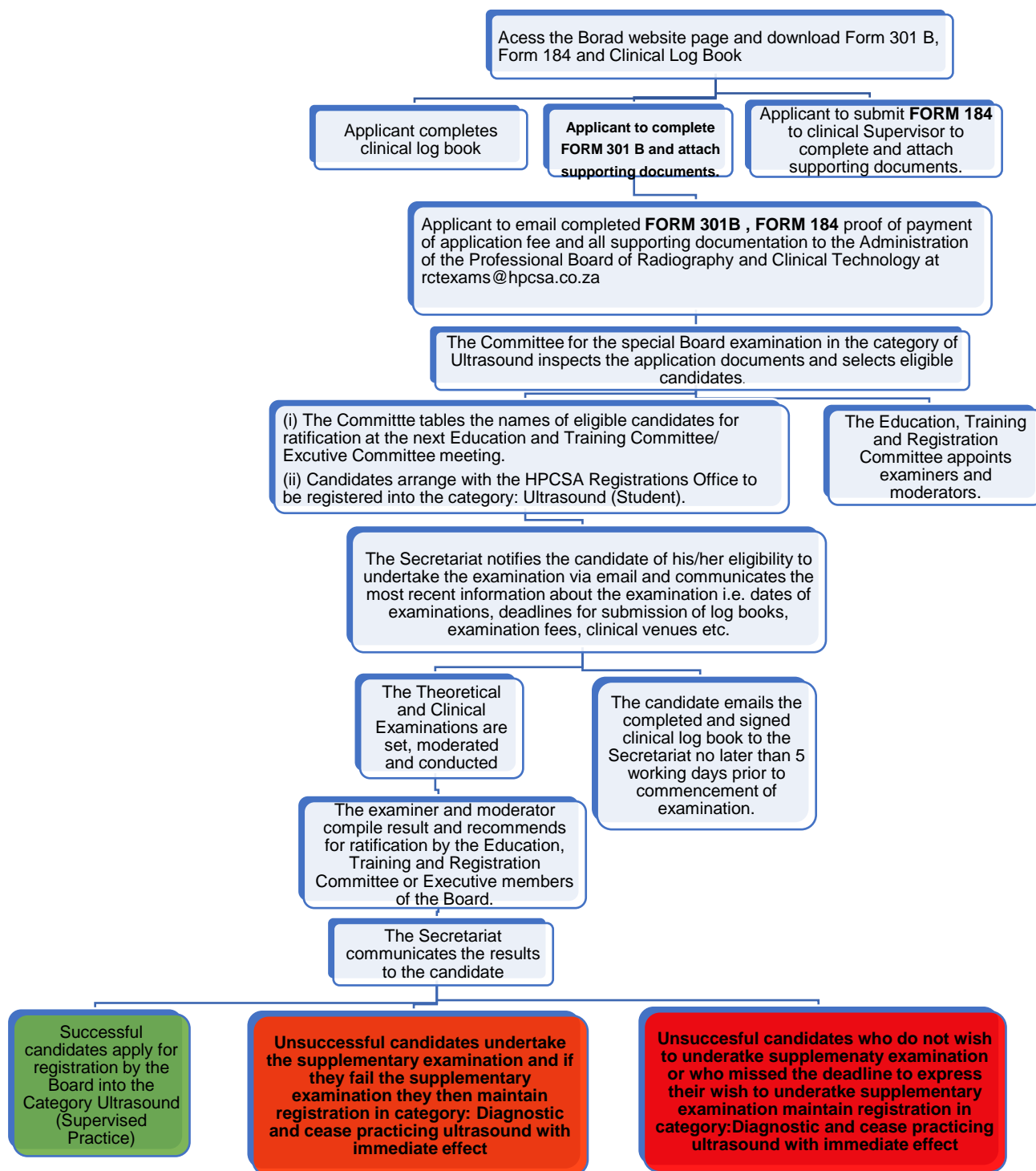
1. Only candidates who qualified in the category diagnostic after 01 January 1994 and;
2. have been performing ultrasound examinations without the relevant qualification prescribed by the Board for registration in the category ultrasound and;
3. who have received informal education and training in ultrasound in the form of short course(s), workshops and or, in-house training and;
4. who wish to register to practice in the category “Ultrasound (Supervised Practice).”

Please note that, a qualified diagnostic radiographer who wishes to practice in the category ultrasound **without the supervision** of a qualified sonographer or radiologist must obtain the relevant three- or four- year qualification in ultrasound through an accredited Higher Education Institution, in accordance with the institution's policies. In other words, a qualified diagnostic radiographer who wishes to practice without supervision in the category **Ultrasound Independent Practice** must obtain the relevant Board approved three- or four-year qualification in ultrasound through a Higher Education Institution, in accordance with the institution's policies

C. EXCLUSION CRITERIA

The duration of ultrasound practice, without a prescribed qualification in the category ultrasound that is applicable in these guidelines, is between 1 January 1994 and 31 December 2019. Therefore, any diagnostic radiographer who commenced performing ultrasound acts and procedures after 31 December 2019 without the registerable ultrasound qualification does not qualify for the Special Board examination in the category Ultrasound. **Such diagnostic radiographers should cease this practice with immediate effect.**

D. APPLICATION AND EXAMINATION PROCESS



E. APPLICATION AND EXAMINATION TIMELINES

- Applications for the Special Board Examination open **June 2020**.
- The application deadline for the Special Board examination is **31 August 2020**.
- The Special Board Examination is scheduled for the end of **March 2021** to cover one day of theory and two days for clinical. The exact dates will be communicated in due course.
- The Secretariat of the HPCSA will communicate the application status within **six (6) weeks** after receiving the application documents. This timeline will only apply provided that the application form for the Special Board Examination by the candidate and the application form for temporary accreditation for training by the clinical practice have been completed correctly, submitted on time, all supporting documents were included in the both applications and that the proof of payment of the application fee was provided.
- The Secretariat of the HPCSA will notify, via email, all the candidates who are deemed eligible for the examination and include in its communication of the application status, updated information about the examination i.e. dates of examinations, deadlines for submission of logbooks, examination fees, clinical venues etc.
- **Within six (6) weeks** of confirmation of application status, candidates deemed eligible for examination by the Board must:
 - email proof of payment of examination fee to Secretariat. Candidates must use their HPCSA registration number as the reference for payment and,
 - communicate with the Registrations office of the HPCSA to be registered in the category: Ultrasound (Student). Please note that candidates **will not be allowed into the examination venue without proof of registration by the Board into the category: Ultrasound (Student).**
- Candidate must email an electronic copy of the clinical logbook to the Secretariat no later than **five (5) working days prior to the date of examination.**
- The Committee for the Special Board Examination will inspect the logbook and conduct an audit of the logbook whilst the examiners mark and moderate the assessments. This process may take a minimum of **eight (8) weeks after the last component of the examination (clinical component) is undertaken** -depending on the number of applications received.
 - NB: Candidates with incomplete or inaccurately completed logbooks **will forfeit the opportunity for registration into the category: Ultrasound (Supervised Practice).**

- NB: Candidates who have passed the theoretical, image evaluation and clinical evaluation but failed to comply with the requirements of the clinical logbook will also forfeit the opportunity for registration into the category: Ultrasound (Supervised Practice)
- The Secretariat will communicate the overall result of the examination (taking into account compliance with the clinical logbook) to the candidate **eight (8) weeks after the last component of the examination (Clinical component) is undertaken.**
- Candidates who **do not meet** the minimum requirements to pass the Special Board Examination (Please see Section M of this document) must send an email to the Secretariat no later than **five (5) working** days after receipt of their examination results expressing, (in writing) their willingness or unwillingness to attempt a supplementary (final) examination.
- The Secretariat will acknowledge receipt and communicate the date of the supplementary (final) examination to those candidates who do not meet the minimum requirements to pass and are eligible for a supplementary (final) examination, within **five (5)** working days of such communication.
- Candidates who do not meet the minimum requirements to pass and are eligible for a supplementary (final) examination but, fail to reply to the Secretariat's communication of the examination results will be deemed to have expressed an unwillingness to undertake the supplementary (final) examination and must thus, **cease practicing ultrasound immediately.**
- Please note that **late** responses, i.e. responses that are submitted more than five (5) working days after receiving the examination results, **will not** be considered.
- The supplementary (final) examinations are scheduled to take place at the end of August 2021. Dates will be confirmed.

Illustration of Application and Examination Timelines



F. CRITERIA FOR ADMISSION INTO THE EXAMINATION VENUE

1. Approval for entry to the examination will be in writing and will be granted by the Education, Training and Registration Committee (ETRC) or members of the Executive Committee (EXCO) of the Board. Candidates must keep a copy of this approval or a copy of confirmation of application status sent to the candidate by the Secretariat, to allow entry into the examination venue.
2. No candidate will be allowed into the examination venue unless the following documents are produced.
 - Proof of identification in a form of the SA identity document and,
 - Approval letter for examination granted by the ETRC or members of the Board's EXCO and;
 - Proof of payment of examination fee and;
 - Proof of registration into category: Ultrasound (Student) and;
 - Proof of electronic submission of clinical logbook to the Secretariat.
3. **Candidates who are more than 15 minutes late for the examination will not be allowed entry into the examination venue.**

G. CRITERIA FOR EXCLUSION INTO THE EXAMINATION VENUE

Any candidate who fails to comply with any one of the conditions set in Section F above, will not be allowed entry into the examination venue.

H. EXAMINATION VENUE AND DATE

1. The Special Board Examination in the category of ultrasound is scheduled as follows:
 - The theoretical and image evaluation component of the examination will be conducted on the first day of the examination.
 - Students will be clinically assessed on abdomen and first-trimester scanning examination over two (2) separate days- day 2 and day 3 of the examination. The clinical component of examination will be conducted at a venue approved by the Board.
2. Based on availability and number of applicants, the Secretariat will arrange four examination venues, one in each of the following provinces:
 - Gauteng
 - Eastern Cape
 - Kwazulu-Natal
 - Western Cape

3. Candidates are responsible for their own traveling, meal and accommodation costs.

I. PURPOSE OF EXAMINATION AND EXIT LEVEL OUTCOMES

The purpose of the examination is to establish whether qualified diagnostic radiographers who are performing ultrasound examinations without a qualification that is prescribed by the Board for registration in the category ultrasound have, through informal or in-house training, acquired a level of competency that makes them eligible to be registered by HPCSA in the category of Ultrasound (Supervised Practice).

J. BENCHMARKING OF THE EXAMINATION WITH ASSESSMENT PRINCIPLES AND STANDARDS OF THE WORLD HEALTH ORGANIZATION (WHO).

The Special Board Examination in the category of Ultrasound is adapted from the curriculum for Level 1 ultrasonography for sonographers and other Allied Health professionals prescribed by *WHO Study Group on Training in Diagnostic Ultrasound: Essentials, Principles and Standards report of 1996*. The Special Board Examination in the category Ultrasound: (Supervised Practice) will include an integration of the following exit level learning areas: anatomy and physiology, pathology, basic principles of ultrasound imaging, principles of ultrasound scanning and technique, patient care, ethics, human rights and law as well as quality assurance.

Anatomy and Physiology

The candidate wishing to undertake the Special Board in the category Ultrasound (Supervised Practice) should master:

- basic anatomy as visualized with ultrasound, with an emphasis on the anatomy of abdominal, pelvic, and foetal structures, soft tissue anatomy, and major vascular structures;
- sectional anatomy, including the relationships of major structures in the sagittal, axial, and coronal planes;
- normal anatomical size and position;
- common anatomical variations;
- normal foetal anatomy.

Pathology

The candidate wishing to undertake the Special Board in the category Ultrasound (Supervised Practice) should have basic knowledge of:

- congenital, inflammatory, degenerative, metabolic, and neoplastic pathology and pathophysiology and common traumatic conditions affecting the major organs, soft tissues, and vascular structures.
- the general indications for and limitations of ultrasonography.
- the basic diagnostic criteria for the interpretation of ultrasound images should be mastered, including tissue characteristics, normal and abnormal organ tissue patterns, and the differentiation of cystic and solid masses.
- standard methods for the reporting and documentation of results should be mastered.

Basic Principles of Ultrasound Imaging (Physics)

The candidate wishing to undertake the Special Board in the category Ultrasound (Supervised Practice) should master the physical principles relating to ultrasound and its interaction with tissues. These include basic terminology, the physics of waves and their interaction with different tissues of the body, including amplitude, intensity, attenuation, perpendicular and oblique incidence, and scattering, the range equation, transducer construction and its effect on ultrasound waves, methods of focusing and resolution, useful frequency ranges, artefacts, biological effects, and safety.

Principles of Ultrasound Scanning and Technique

The candidate wishing to undertake the Special Board in the category Ultrasound (Supervised Practice) should demonstrate competence with the following:

- orientation of the image for standard display formats (head/ foot and right/ left orientation) and image annotation;
- image background (light echoes on a dark background versus dark echoes on a light background);
- scanning planes (sagittal, parasagittal, axial, coronal, and oblique) and image annotation for the scanning planes;
- proper adjustment of equipment controls (system gain, time gain compensation (TGC), depth of field of view, and focal zone placement);
- protocols for routine examinations, including standard transducers,

- the area to be imaged, and any required measurements and documentation;
- frequency, resolution, and their relationship;
- the recognition and identification of common artefacts and strategies to reduce or eliminate them, as well as recognition of artefacts that can enhance diagnostic accuracy;
- permanent image documentation.

K. EXIT LEVEL LEARNING OUTCOMES AND ASSESSMENT CRITERIA

All qualified diagnostic radiographers undertaking the Special Board Examination in the category Ultrasound (Supervised Practice) are required to demonstrate the ability to perform the following:

1. Integrate knowledge of anatomy, physiology and pathology, to select the correct sonographic protocol and equipment applicable to a specific anatomical region.
2. Apply knowledge and skills to perform and adapt ultrasound techniques and protocols applicable to the clinical condition of the patient;
3. Describe sonographic protocols of the most frequently encountered examinations in order to produce the required images for each examination.
4. Demonstrate basic competency in the execution of ultrasound techniques.
5. Critically assess the sonographic images and apply pattern recognition to determine normal and abnormal ultrasound appearances.
6. Critically assess and perform responsible patient care to ensure patient welfare and adhere to basic principles patient safety, human rights and professional ethics.
7. Apply appropriate South African health and safety regulations, ethical principles and codes of practice in performance of techniques;
8. Demonstrate knowledge, understanding and competency in the use of knobology.
9. Demonstrate knowledge and understanding of bioeffects associated with ultrasound and take steps to minimize them.
10. Demonstrate knowledge of artefacts common to ultrasound imaging.
11. Critically assess the quality of images produces and explain, where applicable, how image quality may be further improved.
12. Demonstrate awareness and understanding of the South African health care system.
13. Demonstrate awareness and understanding of the requirements of the Health Professions Council of South Africa in guiding the practitioners and protecting the public.

Please note that a detailed list of expected outcomes per specific area of practice is included in Annexure A of the *Guidelines for the Special Board Examination of qualified diagnostic radiographers in the category: Ultrasound (Supervised practice)*.

L. FORMAT OF EXAMINATION

The examination will comprise of four components, a theoretical (written), image evaluation, clinical assessment and the submission of clinical logbooks.

Part 1: Theoretical Examination

1. The theoretical component of the Special Board examination consists of a written **three (3)-hour** paper set to assess competency in keeping with the requirements for registration in the Category Ultrasound: (Supervised Practice).
2. The examination will include an integration of the following exit level learning areas: anatomy and physiology, pathology, basic physical principles, principles of ultrasound scanning technique, patient care, ethics, human rights and law as well as quality assurance as indicated in Section K above.

Part 2: Image Evaluation

1. This component of the examination consists of a **one (1) hour** assessment in image evaluation to assess competency in keeping with the requirements for registration in the Category Ultrasound: Supervised Practice. The image evaluation for this category of registration, will comprise of an **average of fifteen (15) to twenty- (20) slides** containing ultrasound images with **two (2) minutes** being allowed per image that will be projected onto a screen.
2. Image evaluation is the second component of the Special Board Examination and will be conducted on the afternoon of the same day of the theoretical examination.
3. This examination includes the critical assessment/evaluation of ultrasound images to test the candidate's knowledge in image quality, ultrasound scanning technique, artefacts, anatomical structures and identification of abnormal ultrasound patterns (candidates will not be required to make a diagnosis).

Part 3: Clinical Examination/Assessment

1. The ETRC or the Board EXCO will approve the venue for the examination.
2. During this examination, candidates are required to perform two (2) full sets of clinical examinations on two (2) separate patients, one of which shall be a first-trimester obstetric and the other in abdomen.
3. The clinical examinations will be scheduled over two (2) separate days.
4. The assessment criteria for the clinical examination will include (but are not limited to) the following:
 - Assessment and understanding of request form and examination requested.
 - Introduction of him- herself to the patient.
 - Obtaining informed patient consent.
 - Correct identification of the patient and checking of all patient's details.
 - Room preparation including infection control.
 - Patient preparation.
 - Patient care and communication before, during and after the examination.
 - The use of a logical scanning protocol.
 - ⊖ Safe use of the ultrasound to minimize bioeffects - application of ALARA principle to patient.
 - Competency in ultrasound scanning technique.
 - Assessment of the quality of images produced and corrective measures to improve quality.
 - Assessment of images including knowledge of anatomy and pathology.
 - Assessment of images to include knowledge of artefacts, positioning errors and medico legal aspects.

Part 4: Submission of Clinical Logbook

1. Candidates must keep an accurate and meticulous electronic record of examinations conducted in the workplace.
2. The following is a list of areas of practice required for registration in the category Ultrasound (Supervised Practice).
 - Abdomen
 - Gynaecological
 - First/Second-trimester Obstetrics
 - Small parts

- Deep vein thrombosis (DVT)

A maximum of one hundred and fifty (150) examinations comprising of all of the practice areas mentioned above must be recorded. Of the 150, at least 73% (110) must be in the area of practice that the candidate perceives themselves to be most competent and 27% (40) in all of the remaining areas. Please note that candidates are required to record no less than a minimum of 10 examinations in each of the areas of practice listed above. The examinations recorded must be consistent with the protocol for level 1 ultrasound scanning contained in Annexure A of the *Guidelines for the special board examination of qualified diagnostic radiographers in the category: Ultrasound (Supervised Practice)*.

3. A completed and signed copy of the logbook must be submitted via email to the Secretariat no later than **five (5) working days** prior to the examination date. **The exact deadline for the submission of clinical logbooks will be confirmed in due course.**
4. Candidates with false, incomplete or inaccurately completed logbooks **will forfeit registration** into the category: Ultrasound (Supervised Practice). Candidates who have passed the theoretical, image evaluation and clinical evaluation but failed to comply with the requirements of the clinical logbook **will also forfeit the opportunity to register** in the category: Ultrasound (Supervised Practice).
5. The Board will conduct an audit of the examinations recorded in the clinical logbooks.

M. CALCULATION OF FINAL MARK

A pass mark of 65% for the clinical examination **as well as** 50% for the theory examination must be obtained as a final mark. The mark for the image evaluation will be included in the clinical mark - together these should result in an average of 65% or more. Marks will be calculated as follows:

Final mark for Image evaluation + Clinical \div 3 must be a minimum of 65% and;

Final mark for Theory must be a minimum of 50%.

Candidates who obtain a final examination mark between **45% and 49%** will be eligible to write a supplementary (final) examination.

N. FULFILLMENT FOR REGISTRATION

Candidates will be eligible for registration in the category Ultrasound (Supervised Practice) if:

1. They have submitted a clinical logbook that compiles with the stipulated requirements for registrations.
2. They have attained a pass mark of 65% for the clinical examination (including the image evaluation) **AND** 50 %, for the theory examination must be obtained as final marks. **BOTH** must be achieved in order to pass, **PLUS** the successful completion of the logbook

If a candidate fails one of the first two components, they will be considered as having failed the Board examination, upon which ONE re-assessment for that specific component may be afforded to such candidates. If both of the first two components are failed, the candidate may be offered ONE re-assessment (supplementary) opportunity. The re-assessments (supplementary) will take place on a date set by the Board/ Education, Training and Registration Committee of the Board.

A candidate is therefore required to obtain **both minimum pass marks** as stated above as well as the successful completion of the logbook in order to register with HPCSA in the category of Ultrasound (Supervised Practice).

A candidate will only be allowed to sit for the entry examinations for a maximum of two (2) attempts.

O. SUGGESTED READING LIST

Title	Author(s)	Publication Date	Publisher	ISBN
Ultrasound Physics and Instrumentation	Hedrick, Wayne R; Hykes, David L; Starchman, Dale E	2005	Mosby	9780323080200
Diagnostic Ultrasound: Physics and Equipment	Peter R. Hoskins, Kevin Martin, Abigail Thrush	2014		
Sonography: Introduction to Normal Structure and Function	Curry, Reva Arnez; Tempkin, Betty Bates	2016	Saunders	
Sonography scanning: principles and protocols	Tempkin, BB	2014	Elsevier	9781455773213
Callen's ultrasonography	Norton, ME	2017	Elsevier	9780323497978

in obstetrics and gynecology.				
Obstetric & Gynaecological Ultrasound: How, Why and When	Chudleigh, T; Smith, A; Cumming, S.	2017	Elsevier	9780702031700
Clinical Sonography: A Practical Guide	Sanders, Roger C; Winter, Tom C	2016	Lippincott Williams & Wilkins	9781469811475

P. REMARKING OF SCRIPTS

Only candidates who had obtained a mark of **45- 49 %** in the theoretical examination may apply for their scripts to be remarked.

A remarking fee of 50 % of the examination fee will be charged for a re-mark.

The Administration of the Board at rctexams@hpcsa.co.za may be contacted for information about the remarking fee and the procedure to follow.

Should a candidate pass the theoretical examination but fail the clinical examination, one further attempt will be allowed (See section I above).

P. ADDITIONAL INFORMATION

For further enquiry contact:

The Administration of the Professional Board for Radiography and Clinical Technology
HPCSA
P.O. Box 205
PRETORIA
0001

Email: RCTBoard@hpcsa.co.za

Tell: +27 12 338 9458

Fax: 012 338 9403

ANNEXURE A:

Q. BRIEF OVERVIEW OF THE CURRICULUM FOR GENERAL (LEVEL 1) ULTRASONOGRAPHY

The contents and exit learning areas consistent with general (Level 1) training in Ultrasound for sonographers and other allied health professionals are prescribed in the *WHO Study Group on Training in Diagnostic Ultrasound: Essentials, Principles and Standards report of 1996*. According to WHO, the following presents the specific content that should be mastered in the general ultrasonography curriculum, according to principal anatomical region (abdomen, chest, etc). Sonographers and other allied health professionals successfully completing the general (level1) training should be able - safely, accurately, and consistently – to recognize the ultrasound appearance of the named structures or features, diagnose the conditions specified below, and perform the evaluations and measurements referred to. Variations in ultrasound appearance related to age and sex should be mastered. The following learning outcomes will be assessed using the assessment criteria stated in Section K of this document. The following learning outcomes have been adapted from WHO's curriculum for level ultrasonography.

Please note that the scanning of the breast, neurosonography, third-trimester obstetrics, musculoskeletal, echocardiography does not constitute level curriculum for 1 ultrasonography and must not be practiced in the category: Ultrasound Supervised Practice.

Abdomen

Liver:

Size and shape;

Parenchyma;

Intrahepatic vessels;

Focal lesions, including cysts, abscesses, tumours, trauma and parasites;

Peri-hepatic fluid collections;

Normal and abnormal echogenicity (including both focal and diffuse disease).

Gallbladder and biliary tract:

Gallbladder size, wall, and contents. including calculi and Ascaris:

Biliary tract dilatation and evaluation of the jaundiced patient:

Normal bile duct measurements and physiological variations.

Pancreas:

Normal and abnormal echogenicity:

Diffuse pancreatic disease:

Focal lesions, including cysts. Abscesses, tumours and calcifications.

Spleen:

Size and shape:

Focal lesions;

Trauma.

Kidneys and adrenals:

Size. Shape and location;

Diffuse parenchymal disease:

Focal lesions including cysts, tumours and calculi:

Obstructive uropathy and perirenal fluid collections.

Ureters and bladder:

Obstruction;

Parasites:

Tumours;

Infections:

Diverticula;

Calculi.

Peritoneal cavity and gastrointestinal tract:

Intra-peritoneal fluid collections:

Bowel masses;

Obstruction;

Retroperitoneal space:

Masses:

Adenopathy:

Fluid collections.

Major abdominal vessels:

Normal measurements:

Aortic aneurysm:

Inferior vena cava thrombus.

Chest**Diaphragm.**

Sub-diaphragmatic and supra-diaphragmatic fluid collections.

Pleural effusions.

Pericardial effusion

Female pelvis

Normal physiological changes in the uterus and ovaries.

Diseases of the urinary bladder, uterus, ovaries,

Adnexal masses.

Obstetrics**Normal first trimester:**

Intra-uterine

Embryonic and early foetal anatomy;

Yolk sac;

Amniotic and chorionic cavities;

Biometry including crown-rump length, amniotic sac diameter, and yolk sac size;

Multiple pregnancy:

Cardiac activity and confirmation of viability.

Abnormal first trimester:

Ectopic pregnancy;

Retained products of conception

Foetal death;

Pelvic mass.

Normal second-trimester (examination restricted to foetal viability and dating only)

Liquor volume

Placenta

Multiple pregnancy

Gestational date: Femur length, abdominal circumference, head circumference, BPD (biparietal diameter).

Other applications

Thyroid gland.

Scrotal contents.