



## **CAR Standards for Ultrasound Examination of the Thyroid and Parathyroid**

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These Standards have been developed by the Expert Advisory Panel on Ultrasound chaired by Dr. Shia Salem and presented for adoption to Council by Dr. Donal Downey. Members: M. Atri, M.D., J. Buckley, M.D., P. Cooperberg, M.D., D. Downey, M.D., C. Levi, M.D., V. Nicolet, M.D., Shia Salem, M.D., E. Sauerbrei, M.D., Stephanie Wilson, M.D., W. Zaleski, M.D.

*The standards of the Canadian Association of Radiologists (CAR) are not rules, but are guidelines that attempt to define principles of practice that should generally produce radiological care. The physician and medical high-quality physicist may modify an existing standard as determined by the individual patient and available resources. Adherence to CAR standards will not assure a successful outcome in every situation. The standards should not be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonably directed to obtaining the same results. The standards are not intended to establish a legal standard of care or conduct, and deviation from a standard does not, in and of itself, indicate or imply that such medical practice is below an acceptable level of care. The ultimate judgment regarding the propriety of any specific procedure or course of conduct must be made by the physician and medical physicist in light of all circumstances presented by the individual situation.*

### **I. INTRODUCTION**

These standards have been developed to provide assistance to practitioners performing ultrasound examinations and are based on the standards published by the American College of Radiology and the American Institute of Ultrasound in Medicine. In some cases, additional and/or specialized examinations may be necessary. While it is not possible to detect every abnormality, adherence to the following standards will maximize the probability of detecting most of the abnormalities that occur.

Diagnostic Ultrasound is an established, effective, diagnostic imaging technique which employs the use of high frequency ultrasound waves for both Imaging and Doppler examinations.

Extensive experience has shown that ultrasound is a safe and effective diagnostic procedure. While no demonstrable harmful effects of ultrasound have been demonstrated at power levels used for diagnostic studies, quality assurance dictates it is necessary to utilize this imaging technique in the most appropriate and indicated fashion, and that studies be performed by qualified and knowledgeable physicians and/or sonographers using appropriate equipment and techniques. Diagnostic ultrasound examinations should be supervised and interpreted by trained and credentialed physician imaging specialists.

### **II. SONOLOGIST'S CREDENTIALS CRITERIA**

Physicians involved in the performance, supervision and interpretation of ultrasonography should be Diagnostic Radiologists and must have a Fellowship or Certification in Diagnostic Radiology with the Royal College of Physicians and Surgeons of Canada and/or the Collège des médecins du Québec. Also acceptable are equivalent foreign Radiologist qualifications if the Radiologist so qualified holds an appointment in Radiology with a Canadian University.

As new imaging modalities and interventional techniques are developed additional clinical training, under supervision and with proper documentation, should be obtained before radiologists interpret or perform such examinations or procedures independently. Such additional training must meet with pertinent provincial/regional regulations. Continuing professional development must meet with the requirements of the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.

### **III. SONOGRAPHER'S CREDENTIALS CRITERIA**

Sonographers should be graduates of an accredited School of Sonography or have obtained certification by the American Registry of Diagnostic Medical Sonographers (ARDMS) or the Canadian Association of Registered Diagnostic Ultrasound Professionals (CARDUP). They should be members of their national or provincial professional organization. Continuing medical education should be mandatory consistent with the requirements of ARDMS or CARDUP.

CARDUP will have a national exam process for sonographers in place by 2004. At that time this will become the accepted standard for sonographers. As an interim measure, individual consideration of training and qualifications by a Task Force consisting of members of relevant societies can be recommended for all those whose training does not fall within appropriate guidelines.

#### **IV. DOCUMENTATION**

Adequate documentation is essential for high quality patient care and such documentation should consist of a permanent record of the ultrasound examination and its interpretation. Appropriate normal and abnormal images should be recorded for each anatomical area together with appropriate measurements. Images should be appropriately labelled with the examination date, patient identification and if appropriate image location and orientation. A written report should be included with the patient's medical record.

A permanent record of the ultrasound images and written report shall be retained. The images must be of sufficient quality to record pertinent findings and to be used for comparison with subsequent examinations and enable third party sonologists to confirm the diagnosis. The permanent record of each ultrasound examination should be retained for a statutory period which should be consistent with clinical needs and relevant legal and local health care facility requirements.

Videotape may be a useful supplement to the permanent record of an ultrasound examination. The videotape record of the ultrasound examination should be retained for the similar statutory period as the remainder of the permanent record. The videotape cassette number and counter number (name or time) must be recorded in a log book or on the printed report to allow for future access.

#### **V. SUPERVISION AND INTERPRETATION OF ULTRASOUND EXAMINATIONS**

A sonologist must be available for consultation with the sonographer on a case by case basis. Ideally the sonologist should be on site and available to participate actively in the ultrasound examination when required.

It is recognized however that the geographic realities in Canada do not permit the presence of an on-site sonologist in all locations. Adequate documentation of each examination is critical. A videotape record may be useful as an adjunct to the hard copy images in difficult cases. Despite the geographic isolation of a community the reports must be timely. Furthermore, the sonologist must be available by telephone for consultation with the sonographer and the referring physician. The sonologist should visit the facility on a regular basis to provide on site review of ultrasound procedures and sonographer supervision.

#### **VI. QUALITY IMPROVEMENT PROGRAMS**

Procedures should be systematically monitored and evaluated as part of the overall quality improvement program of the facility. Monitoring should include the evaluation of the accuracy of interpretation as well as the appropriateness of the examination.

Incidence of complications and adverse reactions should be recorded and periodically reviewed in order to identify opportunities to improve patient care.

Data should be collected in a manner which complies with the statutory and regulatory peer review procedures in order to protect confidentiality of the peer review data.

##### **1. EQUIPMENT**

Thyroid and parathyroid studies should be conducted with a real time scanner, preferably using linear or curved linear transducers. The transducer should be adjusted to operate at the highest clinical appropriate frequency. With modern equipment these frequencies are usually 5MHz or greater. For pediatric applications, 7-10 MHz is preferable. Resolution should be of sufficient quality to routinely differentiate small cystic from solid lesions. Doppler frequencies used should be the highest possible to optimize resolution and flow detection. With modern equipment, Doppler frequencies range from 3.5 to 7 MHz.

##### **2. TECHNIQUE**

###### **A. THYROID**

The right and left lobes of the thyroid should be imaged in at least 2 projections, long axis and transverse. Transverse views of the thyroid should include images of the superior, mid and inferior portions of the right and left lobes. Longitudinal images should include medial, mid and lateral portions of each lobe. The thyroid isthmus should be imaged in a transverse plane. The size of each thyroid lobe should be recorded, preferably in 3 dimensions. Visualized thyroid abnormalities should be documented and the location, size, and number of abnormalities should be recorded. Abnormalities of the adjacent soft tissues such as enlarged lymph nodes, thrombosed veins, etc. should be documented.

Whenever possible, comparison should be made with other appropriate imaging studies. Duplex and color Doppler may be useful to evaluate the vascularity of the thyroid gland and of localized masses. Color Doppler can distinguish prominent thyroid vessels from cystic masses and may be used to identify vascular abnormalities adjacent to the thyroid.

Ultrasound guidance may be used to biopsy thyroid masses.

#### B. PARATHYROID

Examination for suspected parathyroid enlargement should include images in the region of the anticipated parathyroid gland location. The examination should be performed with the neck hyper extended and should include longitudinal and transverse images from the carotid arteries to the midline bilaterally and extending from the hyoid bones superiorly to the thoracic inlet inferiorly.

Although the normal parathyroid glands usually are not visualized using currently available sonographic technology, enlarged parathyroid glands in the neck may be visualized. When visualized, the size, number, and location of the parathyroid glands should be documented. Measurements of the parathyroid gland should be made in at least 2 and preferably 3 dimensions.

Ultrasound guidance may be used to biopsy parathyroid glands or to direct ablative interventional procedures.