



Canadian Association of Radiologists
L'Association canadienne des radiologistes

CAR PRACTICE GUIDELINES FOR PERFORMING
ULTRASOUND EXAMINATIONS OF THE

PROSTATE AND SURROUNDING STRUCTURES

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The practice guidelines 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 radiologist and medical physicist may modify an existing practice guideline as determined by the individual patient and available resources. Adherence to CAR practice guidelines will not assure a successful outcome in every situation. The practice guidelines 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 practice guidelines are not intended to establish a legal standard of care or conduct, and deviation from a practice guideline 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.

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1. INTRODUCTION

These guidelines have been developed to provide assistance to practitioners performing transrectal examinations of the prostate and related structures and are based on the practice guidelines published by the American College of Radiology, the American Institute of Ultrasound in Medicine and Society of Radiologists in Ultrasound which we acknowledge.

Ultrasound of the prostate and surrounding structures should be only performed for a valid medical reason. In some cases, additional and/or specialized examinations may be necessary. While it is not possible to detect every abnormality, adherence to the following guidelines will increase the probability of detecting many of the abnormalities that occur.

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, the ALARA principle should be followed and the lowest possible ultrasound exposure settings should be used to obtain the necessary diagnostic information. Quality assurance dictates that 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.

This practice guideline does not include how to perform transrectal prostate interventions such as biopsy and other regional interventions such as fiducial seed placements, brachytherapy seed placements and prostate and seminal drainages and aspirations. When performing interventions, the practitioner should take into consideration guidelines from other national organizations such as the Canadian Urological Association.¹

The effective application of transrectal ultrasound (TRUS) to evaluation of the prostate, and seminal vesicles and other adjacent structures started with the advent of appropriate transrectal (endorectal) probes, recognition of ultrasound appearance of prostate cancer² and advanced further with the biopsy gun.³ The main focus of TRUS ultrasound today relates to prostate cancer and includes biopsy and procedural guidance.⁴ Other indications include evaluation of infertility⁵, male pelvic pain (prostatitis)⁶, hematospermia and evaluation of other adjacent pelvic masses.⁷ For these indications, TRUS is currently the imaging examination of choice and transabdominal/transvesicle scans only have a very limited role.

In contrast, men with isolated lower urinary tract symptoms (LUTS) and urinary dysfunction may not need any imaging unless they have additional symptoms or findings are such as hematuria, infection, or renal insufficiency. Those with such symptoms and findings may require appropriate imaging directed to the clinical concern. In some instances, transrectal examination may be helpful especially if prostate tumors are suspected.⁸

DRE and PSA are currently accepted as the screening tests for prostate cancer. In men suspected to have prostate cancer, TRUS guided biopsy (not TRUS alone) is recommended as the follow up diagnostic test.⁹ Multiparametric MRI can be highly effective in detection of prostate cancer but is limited by high cost and availability.¹⁰

2. SONOLOGIST'S CREDENTIALS CRITERIA

Diagnostic Radiologists involved in the supervision and interpretation of ultrasonography must be certified in Diagnostic Radiology by 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 or is certified by a recognized certifying body and holds a valid provincial license.

3. SONOGRAPHER'S CREDENTIALS CRITERIA

Sonographers should be graduates of an accredited training program or have obtained certification by Sonography Canada / Échographie Canada or the American Registry of Diagnostic Medical Sonographers (ARDMS). They should be members of their national or provincial professional organization. Continuing medical education should be mandatory consistent with the requirements of the facility and Sonography Canada / Échographie Canada or ARDMS.

Provincial practice guidelines should be consulted to determine if such invasive procedures can be delegated to sonographers. Sonographers performing TRUS need to be trained in the safe insertion of the probe into the rectum and safe intracorporeal scanning. Biopsy and other interventions cannot be delegated to sonographers.

4. DOCUMENTATION

Adequate documentation is essential for high-quality patient care and should take into consideration the CAR Standard for Communication of Diagnostic Imaging Findings. Such documentation should consist of a permanent record of the request for examination, the ultrasound examination itself 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, facility identification and image location and orientation. A written report should be included with the patient's medical record.

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.

A permanent record of each ultrasound examination and written report should be retained for a statutory period which should be consistent with clinical needs and relevant legal and local health care facility requirements.

5. 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. 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.

6. QUALITY IMPROVEMENT PROGRAMS

Facilities should maintain and regularly update procedure manuals. 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.

7. EQUIPMENT

Prostate ultrasound should be performed with real-time transrectal probes and biopsy guides suited to intracorporeal insertion and covered with suitable protective sheaths. Preparation and dressing of the probe and subsequent cleaning should follow manufacturer and facility requirements and instructions. Ultrasound equipment needs to have sufficient resolution and clarity in the near field to allow accurate evaluation of tissues within a few millimeters of the tip of the probe (the region of the rectal wall and peripheral zone of the prostate). Important capabilities include biopsy guidance (marker dots on screen) and colour and or power Doppler capability. Additional capabilities may be desirable including elastography, and pulse inversion which can allow evaluation with ultrasonic contrast agents and equipment¹¹ or accessories allowing TRUS/MRI image fusion.¹²

If biopsy and intervention are performed, then additional equipment for use in resuscitation is needed along with procedures to manage complications such as rectal bleeding.

8. SONOGRAPHIC TECHNIQUE

PROSTATE

It is helpful to perform an initial digital rectal examination (DRE) to evaluate and relax the anal canal and also to palpate the prostate to detect palpably suspicious areas to help guide TRUS scan and biopsy. Ultrasound scanning should be done in axial and sagittal planes to show the prostate, seminal vesicles and surrounding structures in their entirety. Representative appropriately labeled images should be taken in both planes of the prostate and seminal vesicles. Prostate measurements should be taken in three planes and prostate volume calculated to allow comparison to other tests such as prostate specific antigen (PSA) and to help with clinical decisions. In patients referred with suspicion of prostate cancer, search should be undertaken to look for areas that are suspicious for malignancy.¹³ In addition to grey scale ultrasonography, other ultrasonographic methods such as colour flow and power Doppler, elastography and contrast enhanced ultrasound may be of help in lesion detection.¹⁴ If suspicious areas are found, their size and stage should be evaluated and reported including extracapsular extension, involvement of seminal vesicles, rectum, bladder and periprostatic nodes. It is important to note that not all prostate cancers are visible at ultrasound and that absence of a visible lesion should not be taken as absence of cancer. In appropriate circumstances, even with a negative ultrasound study, there should still be a recommendation for consideration of biopsy.

SEMINAL VESICLES, VASA DEFERENTIA, AND PERIRECTAL REGION

With infertility, there is a role for TRUS to evaluate seminal structures including the vasa deferentia, seminal vesicles and ejaculatory ducts. In these patients, additional views and measurements of these structures should be obtained. The seminal vesicles should also be evaluated for position, symmetry and echogenicity. Note should be made of obstructing lesions and the presence of cysts such as those of the utricle and ejaculatory ducts.¹⁵

Perirectal masses, collections and abnormalities that are within reach of the transrectal probe can be assessed using views and measurements appropriate to the situation. Colour flow Doppler is useful in evaluating vascularity, especially if biopsy is being considered.

9. PROSTATE BIOPSY AND OTHER PELVIC INTERVENTIONS

Biopsy and other interventions such as aspirations of collections should only be performed with appropriate indications. Patient preparation should be appropriate including informed consent, suitable antibiotic prophylaxis, normalization of coagulation status, and bowel preparation if needed. Those performing prostate interventions should take into consideration provincial or national guidelines such as those published by the Canadian Urological Association.¹

10. REFERENCES

1. El-Hakim A, Moussa S. CUA guidelines on prostate biopsy methodology. *Can Urol Assoc J*. Apr 2010;4(2):89-94.
2. Lee F, Torp-Pedersen ST, Siders DB, Littrup PJ, McLeary RD. Transrectal ultrasound in the diagnosis and staging of prostatic carcinoma. *Radiology*. Mar 1989;170(3 Pt 1):609-615.
3. Torp-Pedersen S, Lee F, Littrup PJ, et al. Transrectal biopsy of the prostate guided with transrectal US: longitudinal and multiplanar scanning. *Radiology*. Jan 1989;170(1 Pt 1):23-27.
4. Hricak H, Choyke PL, Eberhardt SC, Leibel SA, Scardino PT. Imaging prostate cancer: a multidisciplinary perspective. *Radiology*. Apr 2007;243(1):28-53.
5. Jarow JP, Sharlip ID, Belker AM, et al. Best practice policies for male infertility. *J Urol*. May 2002;167(5):2138-2144.
6. Rothman JR, Jaffe WI. Prostatitis: updates on diagnostic evaluation. *Curr Urol Rep*. Jul 2007;8(4):301-306.
7. Giede C, Toi A, Chapman W, Rosen B. The use of transrectal ultrasound to biopsy pelvic masses in women. *Gynecol Oncol*. Dec 2004;95(3):552-556.
8. Nickel JC, Mendez-Probst CE, Whelan TF, Paterson RF, Razvi H. 2010 Update: Guidelines for the management of benign prostatic hyperplasia. *Can Urol Assoc J*. Oct 2010;4(5):310-316.
9. Izawa JI, Klotz L, Siemens DR, et al. Prostate cancer screening: Canadian guidelines 2011. *Can Urol Assoc J*. Aug 2011;5(4):235-240.
10. Haider MA, van der Kwast TH, Tanguay J, et al. Combined T2-weighted and diffusion-weighted MRI for localization of prostate cancer. *AJR Am J Roentgenol*. Aug 2007;189(2):323-328.
11. Pallwein L, Mitterberger M, Pelzer A, et al. Ultrasound of prostate cancer: recent advances. *Eur Radiol*. Apr 2008;18(4):707-715.
12. Pinto PA, Chung PH, Rastinehad AR, et al. Magnetic resonance imaging/ultrasound fusion guided prostate biopsy improves cancer detection following transrectal ultrasound biopsy and correlates with multiparametric magnetic resonance imaging. *J Urol*. Oct 2011;186(4):1281-1285.
13. Shinohara K, Scardino PT, Carter SS, Wheeler TM. Pathologic basis of the sonographic appearance of the normal and malignant prostate. *Urol Clin North Am*. Nov 1989;16(4):675-691.
14. Harvey CJ, Pilcher J, Richenberg J, Patel U, Frauscher F. Applications of transrectal ultrasound in prostate cancer. *Br J Radiol*. Nov 2012;85 Spec No 1:S3-17.
15. Kuligowska E, Fenlon HM. Transrectal US in male infertility: spectrum of findings and role in patient care. *Radiology*. Apr 1998;207(1):173-181.