

Please follow these instructions carefully.

SUBMISSION OF TESTING MATERIALS

The enclosed labels show when your testing materials are due to the ACR. Failure to meet this due date will jeopardize completion of your accreditation. If your facility is renewing its accreditation, we cannot guarantee completion before your ACR certificate expires.

*****If you decide to change the type of exam you will be submitting, you must notify the ACR for new labels to replace that exam. All submissions will be returned if notification did not occur. *****

Introduction

This packet includes all the labels for the required ultrasound images. Each set of ultrasound examinations will be evaluated for:

- Technique parameters
- Anatomic coverage and display
- Exam identification (All information annotated on clinical examinations will be kept confidential by the ACR.)

Clinical images should represent your facility's standard exam protocols. However, please refer to the enclosed *Evaluation Attributes Document* for additional guidance. In the initial application, your facility selected the exams that you will submit from each module for accreditation. Please refer to the barcode labels provided for the exams that your facility selected. If you run out of barcode labels, use the additional image labels included in this package. Do not make copies of the existing barcode labels. Use one label per film. You must fill in all the blanks on each label. Retain a copy of the completed label sheet with the blanks filled in for your records. If you need additional labels, please contact the ACR. *All films should be properly identified and labeled*

The following identifying demographic data must be displayed on each image:

- First and last name
- Medical record number
- Institution name
- Date and time of examination

Adding the technologist's identification number, name, or initials to at least one image of the examination is recommended.

Clinical Image Checklist

1. Clinical images for Obstetrical, Gynecological, and General Accreditation should be normal exams.
2. Gynecological accreditation requires **four** complete female pelvis exams from **four different patients**. At least one exam out of the four must include an endovaginal study. **(If you have selected female pelvis for the general module, this must not be one of the patients submitted under the gynecological module. The site is required to submit FIVE exams if both Gynecological and General are selected).**
3. Vascular accreditation requires one normal and one abnormal case be submitted for each examination chosen. If you are having difficulties obtaining an abnormal, please contact the ACR.
4. Clinical images should be accompanied by the physician report to confirm the date of the examination and must include diagnostic physiologic and anatomic findings for all vascular exams.
5. Images should be submitted in standard transparency form.
6. Images should be original or near-original quality copies. Clinical images submitted will be returned upon completion of the accreditation process.
7. Clinical Images should represent current practice and be dated within 105 days of the due date demonstrated on the bar-coded labels.
8. All views of an US examination must be from an examination performed on the same patient.
9. Place one bar-coded label on each sheet of film from the examination, covering the least amount of identifying information or diagnostic area as possible. (You may have more labels than you need.)
10. The reviewers assume that the images submitted are examples of your **best** work. Any exam that demonstrates your best imaging can be submitted. The committee recommends that the supervising physician take an active role in the selection of films for evaluation. Do not submit patient images that you believe are less than optimal.
11. All testing materials must be submitted to the ACR within **45 calendar days** from the date sent or the application will be made inactive.

Paperwork Checklist

1. **For vascular exams, sites must include diagnostic and physiologic criteria for interpretation with their clinical exam submission.** Diagnostic criteria should consist of a brief summary of the criteria the physician(s) at the facility use to determine normal vs. abnormal exams. For Duplex carotid exams the velocity table should be included.
2. For arterial and carotid vascular work, the reports must contain results from noninvasive pressure testing, where appropriate, obtained either from the referral source or from actual testing performed at your own site of practice.

Failure to include all of the above will delay the review of your submitted materials.

Ultrasound Equipment Quality Control

A quality control (QC) program must be in place for each scanner in the facility. The QC program must be directed by a medical physicist or by the supervising radiologist or physician who may appoint an appropriate designee to oversee the program. The same tests must be performed during each testing period so that changes can be monitored over time and effective corrective action can be taken. Testing results, corrective action, and the effects of corrective action must be documented and maintained on site.

The QC program must evaluate at least the following items in gray-scale imaging mode:

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- System sensitivity and/or penetration capability.
- Image uniformity.
- Assurance of electrical and mechanical safety and cleanliness
- Photography and other hard-copy recording.

In addition, it is recommended that users verify the accuracy of vertical and horizontal distance measurement when a QC program is initiated for an ultrasound unit.

These items may be assessed using a commercially available phantom test object. At the present time, no one type of phantom is preferred; users should select one that is commercially available. Using a phantom will be helpful in responding to questions about low-contrast detectability in the quality control part of the testing materials. However, the use of a phantom is *optional* at this time. Questions relating to characteristics associated with system sensitivity and image uniformity may be answered without the use of a phantom as a test object.

Transducer Testing

On an ongoing basis (at least semiannually), the following tests should be done for each ultrasound unit. Testing should be done using two transducers commonly used with any unit employing more than one transducer. Data should be taken from testing of the transducers which are used for the *most frequently occurring* examination(s) at the site. It is recommended that these be of different scan formats such as one linear (or curvilinear array), and one sector (mechanical, phased or vector).

System Sensitivity/Penetration (Required)

This test should be done with the following settings:

- maximum transmit power
- proper receiver gain and TGC that allows echo texture to be visible in the deep region
- transmit focus at the deepest depth

The maximum depth of visualization is determined by comparing the gradually weakening echo texture to electronic noises near the bottom of the image.

Image Uniformity (Required)

Adjust the TGC controls and other sensitivity controls to obtain an image as uniform as possible.

- vertical or radially oriented streaks?
- dropouts?
- reduction of brightness near edges of the scan?
- brightness transitions between focal zones?

Electrical and Mechanical Safety and Cleanliness

- Are all cords and cables intact (no frays)?
- Are all transducers intact without cracks or delamination?
- Are the transducers cleaned after each use?
- Are the image monitors clean?
- Are the air filters clean?
- Are the wheel locks in working condition?

- Are the wheels fastened securely to the US unit and do the wheels rotate easily?
- Are all accessories (VCR, cameras, etc.) fastened securely to the US unit?

Gray Scale Photography (if applicable) – Do either A, B or C

A. For Scanners with a Discrete Bar Pattern:

Count the number of distinct gray bar steps on the viewing monitor. Then count the number of steps visualized in the gray bar on the hard copy image.

B. For Scanners with a Continuous Gray Bar Pattern:

Use calipers to measure the length of the black-to-white transition of the gray wedge on the viewing monitor. If the relative length of the black-to-white transition on the hard copy image is less, document how much is missing.

C. For Laser Imager (Hard Copy Device)

Prior to filming any images, a SMPTE test pattern created by the Society of Motion Picture and Television Engineers, should be printed using the appropriate window width (WW) and window level (WL). If you are unfamiliar with this procedure, you should review Gray et al., “Test pattern for video display and hard-copy camera,” *Radiology* 145:519-527 (1985), and then contact your local service engineer for assistance.

When printed, the 95% density patch within the 100% square and the 5% density patch within the 0% square should be visible, and there should be no notable distortions or artifacts present. If these criteria are not met, contact your service engineer for laser camera calibration before proceeding with *any* filming.

Hard Copy Output Quality Test (Digital) (if applicable)

This test, or a similar test specifically recommended by the hard copy equipment manufacturer, should be carried out at least monthly.

Required Test Equipment

- Densitometer
- SMPTE (Society of Motion Picture and Television Engineers) Test Pattern or another similar test pattern or phantom image having a wide range of gray scales.

The same test image should be used each time.

Test Procedure Instructions

1. Display the SMPTE test pattern or phantom image on the monitor with gray scales ranging from white to black and a reasonable range of gray scales in between.
2. Record the window width and the window level settings used to display the image; the same window width and level settings should be used for each subsequent display and printed image.
3. Print the image on film.
4. Process the film.
5. View the recorded film image on an appropriately masked viewbox next to the monitor.
6. Measure the optical density at four consistent locations on the film and record.
7. Compare all optical density measurements to those from the previous month’s image.

Data Analysis and Interpretation:

1. Visually compare gray scales on the film and monitors using the same window width and window level settings as used to produce the film.
2. The first time this procedure is performed and there is consistency between the monitor and film, record these window width and window level values and measured optical density film values on the chart as your control level.

QC Data to be Submitted for Accreditation

For each unit, submit a copy of your most recent physicist's or service engineer's report. This QC report should document results of the above testing. In addition, a Quality Control Worksheet must be completed and submitted for each unit.

Check List

- Completed Quality Assurance Questionnaire
- Most recent physicist or service engineer report on each unit
- Clinical Images – correctly labeled
- Physician Report for all clinical exams
- Diagnostic Criteria for all vascular exams
- Quality Control Worksheet, one for each unit (make copies)

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