



## **CAR Standard for Performance of Contrast Studies of the Pharynx and Oesophagus in the Adult**

### **Approved: June 1994**

These standards were reviewed by the Gastrointestinal Expert Advisory Panel: France Bourdon, MD, Montreal, Chair, J. Stephen Fache, MD, Vancouver, László A. Fried, MD, Halifax, David Reid, MD, Calgary, Giles W. Stevenson, MD, Hamilton, Hardy Tao, MD, Ottawa

*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**

Contrast studies of the pharynx and oesophagus are established procedures for the evaluation of the swallowing mechanism and the oesophagus. They can exclude dysfunction of the swallowing mechanism and many diseases of the oesophagus and can determine the extent of abnormalities.

### **II. DEFINITIONS**

In view of the wide discrepancies in basic nomenclature, the following are given as definitions for terms which will be used in this document.

**A. The barium swallow** is a study of the swallowing mechanism and the anatomy of the pharynx and the entire oesophagus. The study does not include evaluation of the stomach and duodenum. Another term in current use is: "**Video oesophagram**".

**B. The modified barium swallow** is a study of the swallowing mechanism by means of boluses of various textures and consistencies with manoeuvres appropriate to the individual patient. Other terms in current use are: "**provocative barium swallow**", "**swallowing assessment**", "**specific barium swallow**" and "**therapeutic barium swallow**".

### **III. INDICATIONS**

There are nine common indications for the radiological examination of the pharynx and oesophagus:

- A.** Suspected aspiration or difficulties in feeding
- B.** Dysphagia
- C.** Odynophagia
- D.** Suspected obstruction by swallowed foreign body
- E.** Suspected perforation
- F.** Follow-up after treatment of an oesophageal disease

**G.** Globus

**H.** Chest pain

**I.** Suspected gastroesophageal reflux disease

Depending on the type of dysphagia, performing a barium study of the stomach instead of or in addition to the barium swallow in the same session may be indicated. Indication "G", "H" and "I" are such examples.

The standards which follow are primarily addressed to indications "A" through "F" and outline procedures for assessing these patients.

#### **IV. PHYSICIAN QUALIFICATIONS**

That Physicians involved in the performance, supervision and interpretation of contrast studies of the pharynx and oesophagus 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 foreign Specialist 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.

#### **V. RADIOLOGIC TECHNOLOGISTS**

The medical radiation technologist must have Canadian Association of Medical Radiation Technologists certification or be certified by an equivalent licensing body recognized by the CAMRT.

Under the overall supervision of the radiologists, the technologist will have the responsibility for patient comfort and safety, for examination preparation and performance, and for image technical evaluation and quality and applicable quality assurance.

The training of technologists engaged in specialty activities shall meet with applicable and valid national and provincial specialty qualifications. Continued education of technologists is encouraged by the CAMRT and should meet pertinent provincial regulations.

#### **VI. EQUIPMENT AND QUALITY CONTROL**

Examinations should be performed with fluoroscopic and radiographic equipment meeting all applicable federal and provincial radiation standards.

Each imaging facility should have documented policies and operations for monitoring and evaluating the effective management, safety and operation of imaging equipment. The quality control program should be designed to minimize patient, personnel and public radiation risks and maximize the quality of the diagnostic information.

At least annually or as required by provincial law, equipment performance should be monitored and a quantitative dose determination should be conducted by a qualified medical radiation physicist or a qualified designated substitute.

#### **VII. EXAMINATION PRELIMINARIES**

**A.** A written request from the referring physician, including the reason for consultation and appropriate clinical history, should be available.

**B.** Patients are usually kept fasting and are discouraged from smoking or chewing gum so as to decrease pharyngeal secretions and improve mucosal coating by barium. Also, in some cases, the

radiologist may wish to perform a barium study of the stomach and duodenum instead of, or in addition to the barium swallow, based on clinical and/or fluoroscopic findings.

C. The medical chart of hospitalized patients should accompany the patient to the fluoroscopic unit.

D. In the evaluation of suspected or clinically proven neuromuscular abnormalities, an interdisciplinary approach is preferred for evaluation of the physiology of the swallowing mechanism. Ideally the patient should be accompanied by the clinician or a therapist who can help guide the study.

## **VIII. CHOICE OF RADIOGRAPHIC MODALITY, CONTRAST MEDIUM AND EXAMINATION**

All radiologists should be able to perform and interpret the following studies. The choice is the prerogative of the radiologist and is an educated decision based on the established literature, the condition of the individual patient, and the clinical problem to be solved.

The following are given as guidelines for making these choices:

A. Physiologic evaluation of the swallowing mechanism should be recorded on video equipment, or equivalent technology, because rapid sequence filming does not adequately assess swallowing or oesophageal motility.

B. High density barium is recommended for the static films of the pharynx, while high density barium and effervescent granules are usually used to evaluate organic lesions and mucosal abnormalities of the oesophagus.

Medium density barium may be used to evaluate motor abnormalities and aspiration.

C. Water soluble contrast should be reserved for patients in whom perforation or post-surgical anastomotic leak is suspected. When communication with airways is suspected, however, barium, in small quantities remains the preferred contrast material although low osmolality water soluble contrast media or hexabrix may also be used.

D. Functional abnormalities are best evaluated by tailoring the examination to the patient's specific problems and using food mixed or coated with barium of various viscosities.

E. The combined evaluation of the swallowing mechanism and oesophagus should not be dissociated because the level of symptomatology is not always precise or reliable and because there is a high frequency of associated disorders of the pharynx and oesophagus.

## **IX. EXAMINATION TECHNIQUE**

The following must be modified by the radiologist, guided by the condition of the patient, the clinical information supplied by the referring physician and/or speech therapist, and findings during fluoroscopy.

### **A. BARIUM SWALLOW**

#### **1. Suggested procedure:**

The sequence of films varies from one radiologist to another, but certain principles can be stated.

- a) Pharyngeal motility is more readily assessed in the erect lateral and anterior projections.
- b) Pharyngeal and oesophageal double contrast films are more easily obtained with the patient erect
- c) Oesophageal motility should be assessed with the patient in the recumbent, usually oblique position. The patient takes single swallows while the progression of the peristaltic wave is followed fluoroscopically.
- d) The oesophagus should be documented in mucosal relief

#### **2. Quality controls specific to this study are:**

- a) All portions of the pharynx, the oesophagus and the gastroesophageal junction are seen to be well distended.
- b) The pharynx is well coated with barium.
- c) Barium filled films of the oesophagus are well-penetrated.
- d) Double contrast views of the oesophagus show good coating of the mucosal surface.

## **B. THE MODIFIED BARIUM SWALLOW**

### **1. Suggested procedure:**

This must always be dictated by the patient's specific problem and therefore will vary more than a conventional barium swallow.

- a) The examination is ideally initiated in the upright lateral projection.
- b) Since semi solid food is often better tolerated than any other texture, this is usually used first, followed by solids and finally liquids which are most likely to result in aspiration.
- c) Food is opacified with barium of appropriate viscosity.

### **2. Suggested documentation:**

- a) Video recording in the lateral and AP projections.
- b) An AP film of the mediastinum or PA chest may be done to document extent of aspiration.

## **C. SPECIFIC INDICATIONS**

### **1. Dysphagia**

The examination may start with sips of barium, and proceed to larger volumes and a conventional barium swallow. If the study is normal with a liquid bolus, a solid bolus such as a marshmallow or a barium tablet may be useful.

### **2. Suspected perforation**

A preliminary chest radiograph and, on occasion, a lateral film of the neck should be performed. Water soluble contrast medium should be used initially, followed by barium in moderate volumes, should the initial evaluation be negative.

### **3. Odynophagia**

Films should be taken early as extreme pain may curtail the study. Ideally, mucosal relief, double contrast and contrast filled films should be obtained of the whole oesophagus with careful fluoroscopic examination.

### **4. Suspected foreign body**

A preliminary fluoroscopic examination of the oesophagus with rotation of the patient may be helpful before contrast is given, to look for unusual densities. Water soluble contrast should be used if endoscopy is likely to follow. Small volumes of contrast should be used until it is clear that there is no obstruction, at which point a conventional barium swallow may be performed. When there is obstruction by a foreign body, medications, usually antispasmodics may be useful to relieve spasm and promote passage of the foreign body.

### **5. Gastroesophageal reflux**

Usually part of the evaluation of the oesophagus, stomach and duodenum. However, in the context of the barium swallow, if reflux is suspected and does not occur spontaneously, a variety of means may be used to provoke it.

### **6. Follow up after treatment of an oesophageal disease:**

The examination can be quite limited and will depend on the clinician's needs for the specific follow up purpose. A clear written request for consultation is particularly important to guide these studies.

## **X. QUALITY CONTROL**

The following controls should be applied to all barium swallows and oesophagrams:

**A.** Once examinations are completed, the images must be checked by the radiologist before the patient is permitted to leave the department, and the technician must verify that the video or digital images are technically satisfactory.

**B.** Poorly exposed, inadequately centered or positioned films and blurred films should be repeated as necessary. An inadequate video recording may need to be amended.

**C.** An attempt should be made to resolve questionable radiologic findings before the patient leaves.

**D.** Radiologic findings should be correlated with endoscopic surgical pathologic findings where available.

## **XI. QUALITY IMPROVEMENT**

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 radiologic interpretation as well as the appropriateness of the examination.

The incidence of complications and adverse events should be recorded and periodically reviewed in order to identify opportunities to improve patient care.

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

## **XII. THE REPORT**

This should conform with the CAR Standards for communication in diagnostic radiology.