

## CERVICAL SPINE EVALUATION

Original Release/Approval:	1 March 2010	Note: This CPG requires an annual review	
Reviewed:	June 2010	Approved:	30 Jun 10
Supersedes:	This is a new CPG and must be reviewed in its entirety		
<input type="checkbox"/> Minor Changes	(or)	<input type="checkbox"/> Changes are substantial and require a thorough reading of this CPG	(or)
<input checked="" type="checkbox"/> Significant Changes	Appendix B flowchart has been modified to correspond with the text in the CPG		

**1. Goal.** To provide a brief review of the indications for and methods of determining if a combat casualty patient has sustained a cervical spine injury.

### 2. Background.

- a. While cervical spine (CS) injuries are relatively common in major trauma, they have received less attention in the combat environment due to the prevalence of penetrating injury mechanisms. With the high incidence of explosive injury in present conflicts, providers must pay greater attention to the indications for and methods of ruling out cervical spine injury, or what is popularly referred to as cervical spine clearance.
- b. Physical exam is essential for cervical spine clearance, but most patients will require some form of imaging. Imaging studies traditionally included plain radiographs in the anterior-posterior, lateral, and odontoid views. "Swimmers" view or flexion-extension view have been added as adjuncts in some protocols.
- c. In the past decade Computed Tomography (CT) Scanning has supplanted plain radiography as the primary screening modality for patients who require imaging. In the combat environment, plain radiography should be utilized only in situations where a CT scanner is unavailable.

### 3. Evaluation and Treatment.

- a. **Indications for cervical collar placement in the pre-hospital environment.** All patients who have sustained injuries through the following mechanisms should have a cervical collar placed in the pre-hospital environment if the tactical situation allows:
  - Trauma resulting in loss of consciousness or even the question of loss of consciousness due to any form of head injury
  - Trauma resulting in temporary amnesia
  - Major explosive or blast injury
  - Mechanism that produces a violent impact on the head, neck, torso or pelvis
  - Mechanism that creates sudden acceleration/ deceleration or lateral bending forces on the neck or torso
  - Fall from height (vs. fall from standing)
  - Ejection or fall from any motorized vehicle

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- Vehicle roll-over
- (1) Any patient complaining of neck pain or displaying neurological impairment following a trauma should have a cervical collar placed.
- (2) Patients with penetrating cervical injury from an explosive mechanism should have a cervical collar placed if possible. When a blunt mechanism is combined with a penetrating injury, the cervical collar is an important protection until unstable spinal injury is ruled out, but all providers must be aware that the collar may hide other injuries and developing pathology such as expanding hematoma. Patients with isolated penetrating cervical injury who are conscious and have no neurologic signs should not have a cervical collar placed in the pre-hospital environment. Patients with isolated penetrating brain injury do not require a cervical collar unless the trajectory suggests cervical spine involvement.
- (3) **On the battlefield, preservation of the life of the casualty and medic are of paramount importance. In these circumstances, evacuation to a more secure area takes precedence over spine immobilization.**
- (4) If a patient has indications for cervical collar placement, and one had not been placed in the pre-hospital environment for whatever reason, the collar should be placed at the earliest opportunity
- b. **Indications for Cervical Spine Clearance Algorithm.** Any patient with a suspected cervical spine injury and a neurologic deficit should have a cervical collar in place, and should be referred immediately for neurosurgical consultation and imaging. All other patients who have indications for pre-hospital cervical collar placement as detailed above should undergo cervical spine clearance by algorithm. There are separate algorithms for reliable and unreliable patients. Unreliable patients are those who cannot adequately communicate, have a decreased level of consciousness (GCS<15), or have a significant distracting injury.
  - (1) Significant distracting injury is defined as any injury which is so painful that it may obscure the patient's ability to notice pain in their neck. Some evidence suggests proximity increases the risk of distraction, and therefore upper extremity and upper torso injuries are more likely to be distracting than lower torso or lower extremity injuries. The treating physician has final say in determining a certain injury is distracting enough to render a patient unreliable and require clearance via the unreliable patient algorithm. If uncertain, err on the side of caution and consider the injury distracting and proceed accordingly.
- c. **Cervical spine clearance algorithms.** See Appendix A for protocol diagrams. If possible, the cervical spine should be cleared and the collar removed within 24 hours of collar placement. If the clinical scenario requires the collar remain in place over 24 hours, stiff extrication collars should be replaced with collars designed for long-term immobilization that provide greater padding and decubitus ulcer prevention.
- d. **Cervical spine clearance in the obtunded patient.** CS clearance in the obtunded patient presents additional challenges to the clinician, especially in the combat environment. These patients should undergo CT CS clearance; flexion/extension radiography should not be done in the comatose patient. For the obtunded patient with a

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negative CT and gross motor function of extremities, the risk/benefit ratio of obtaining an MRI in addition to CT is not clear at present. The incidence of significant CS injury with a negative CT CS is small and approaches zero. There are significant, nontrivial risks in bringing severely injured, mechanically ventilated patients to the MRI suite and the first level of care offering MRI capability for CENTCOM trauma patients is Level IV.

Additionally, many believe a CS MRI should be performed within 72 hours of injury to be able to adequately detect soft-tissue injury. Although most patients reach Level IV within 72 hours of injury, some do not. Since there is currently no compelling evidence that MRI is a clinically significant adjunct to a negative CT CS in the obtunded patient, MRI is not recommended as an adjunct to CT CS clearance in the obtunded patient at this time and the cervical collar may be removed in these patients if the CT CS is negative.

- e. **Cervical spine clearance documentation.** It is preferred that the JTTS Cervical Spine Clearance Note (Appendix A) be used for documenting the cervical spine evaluation and clearance status. This comprehensive note includes indications for clearance, exam, imaging studies, and final clearance status. The note is intended to bring together all cervical spine information onto one sheet of paper and was designed to improve both the completeness and speed of documentation.

**4. Author.** The primary author for this CPG is Nelson G. Rosen, LTC,MC, USA, Chief, 1<sup>st</sup> Forward Surgical Team.

**5. Responsibilities.** It is the trauma team leader's responsibility to ensure familiarity and appropriate compliance with this CPG.

### **6. References.**

<sup>1</sup> Arishita GI, Vaver JS, Bellamy RF. "Cervical spine immobilization of penetrating neck wounds in a hostile environment," J Trauma. 1989 Mar;29(3):332-7.

<sup>2</sup> Eastern Association for the Surgery of Trauma, *Practice management guidelines for identification of cervical spine injuries following trauma – update*, available at <http://www.east.org/tpg.asp>, accessed 20090425.

<sup>3</sup> Emergency War Surgery Handbook, Third United States Revision. Borden Institute, Walter Reed Army Medical Center, Washington, DC, 2004.

<sup>4</sup> Heffernan DS, Schermer CR, Lu SW. "What defines a distracting Injury in Cervical Spine Assessment?" J Trauma 2005 Dec;59(6):1396-9.

<sup>5</sup> Mahoney PF, Steinbruner D, Mazur R, et al. "Cervical Spine Protection in a Combat Zone", Electronic Publication. Injury 2007. Oct; 38(10):1222-20.

<sup>6</sup> Salomone JP, Pons PT, McSwain NE, eds. *PHTLS Preshospital Life Support: Military Version*, Mosby Elsevier, St. Louis, Sixth Edition, 2007.

<sup>7</sup> Como, JJ, et.al. "Practice Management Guidelines for Identification of Cervical Spine Injuries Following Trauma: Update From the Eastern Association for the Surgery of Trauma Practice Management Guidelines Committee," J Trauma. 2009; 67: 651-659.

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Approved by CENTCOM JTTS Director, JTS Director and Deputy  
Director and CENTCOM SG

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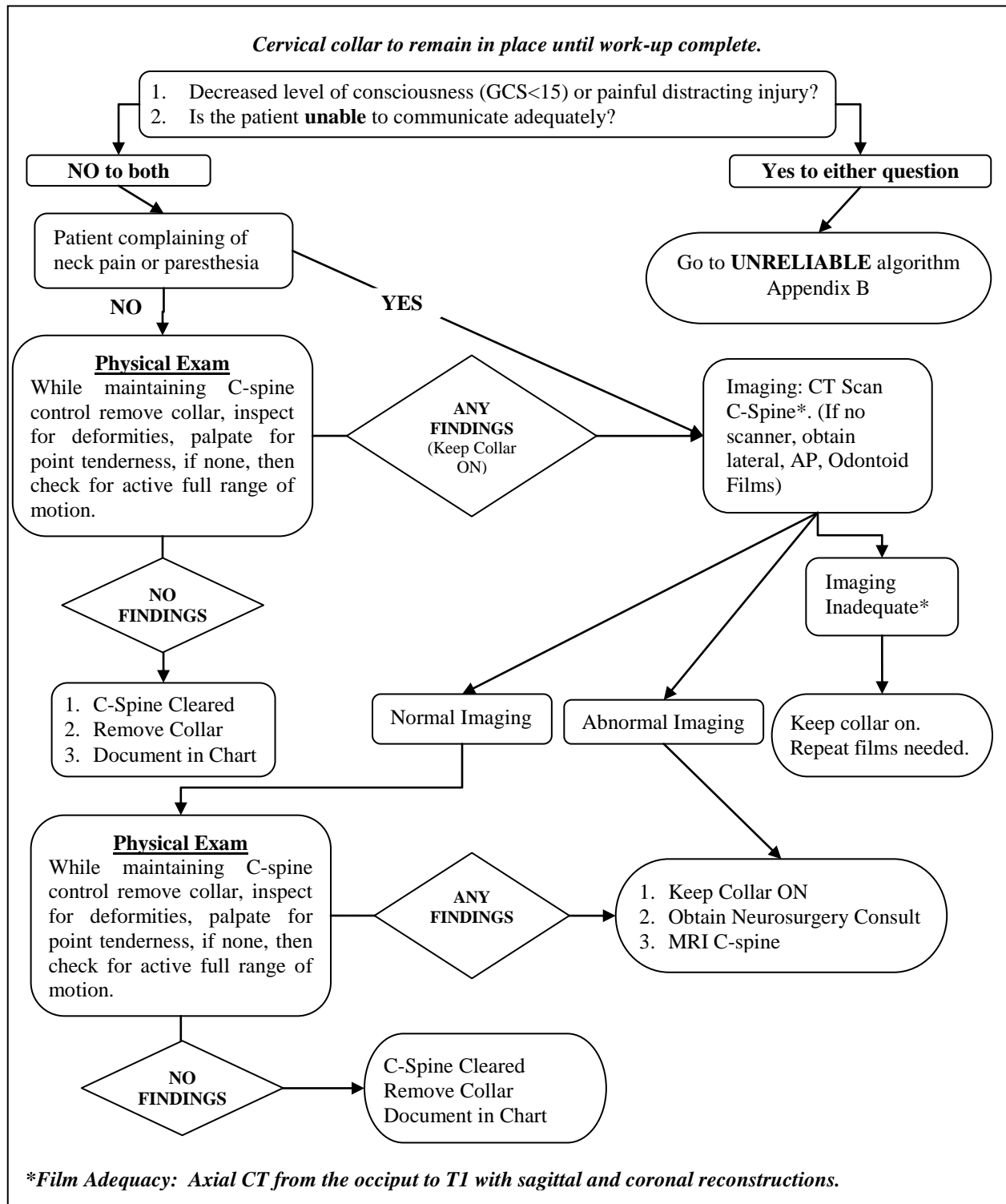
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## APPENDIX A

### CERVICAL SPINE CLEARANCE ALGORITHM RELIABLE PATIENT WITH NO NEUROLOGIC DEFICIT

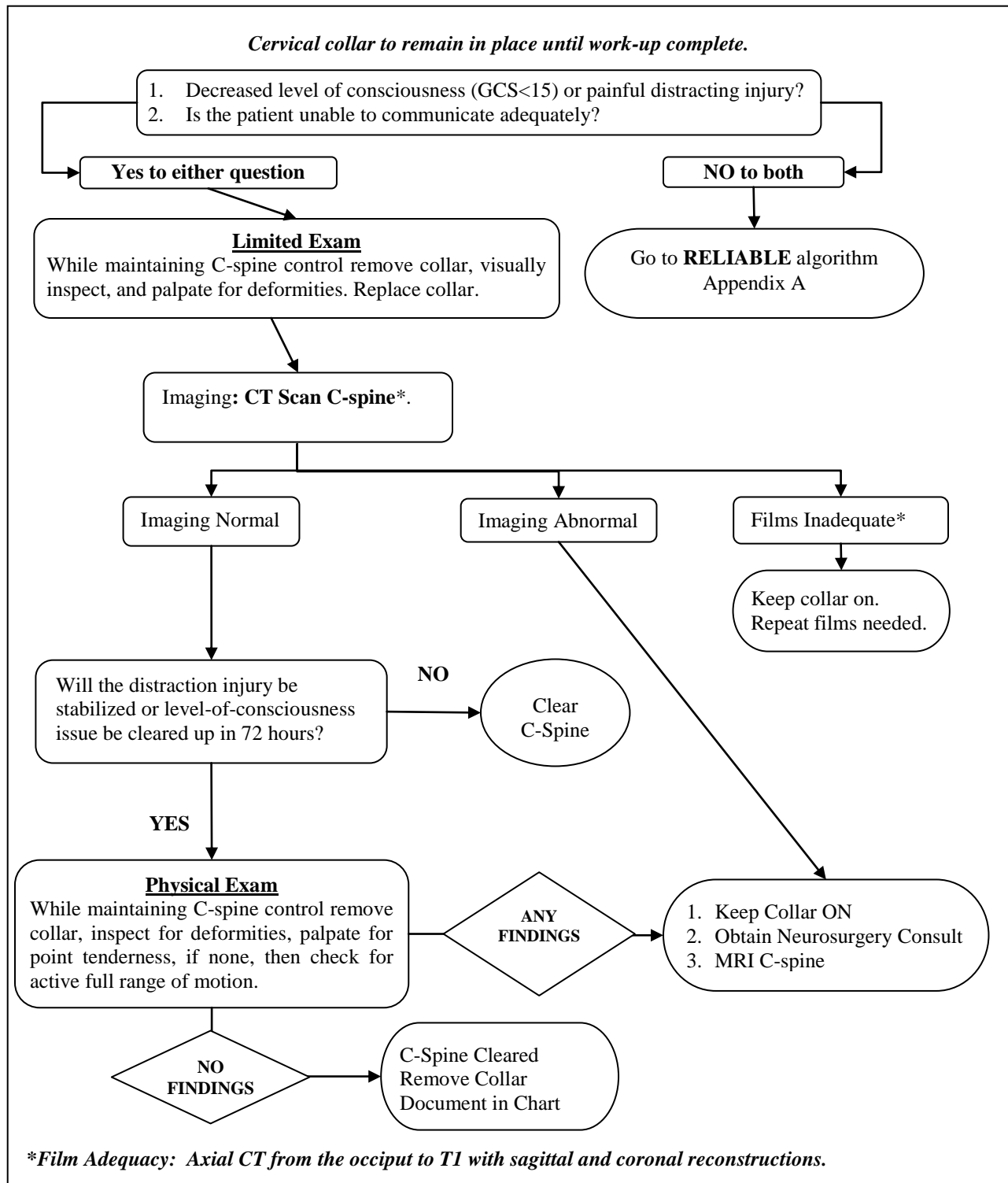


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## APPENDIX B

### CERVICAL SPINE CLEARANCE ALGORITHM - UNRELIABLE PATIENT



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## APPENDIX C

### JOINT THEATER TRAUMA SYSTEM – CERVICAL SPINE CLEARANCE STATUS

#### JOINT THEATER TRAUMA SYSTEM - CERVICAL SPINE CLEARANCE STATUS

Mechanism: ☐ Explosive ☐ MVC ☐ Fall ☐ Other

Notes: \_\_\_\_\_

Collar placed: ☐ Pre-hospital ☐ Hospital ☐ No Collar

#### Patient

##### RELIABLE?

☐ Yes

☐ No

Reason Unreliable:

☐ Altered Mental Status (GCS<15)

☐ Significant Distracting Injury

Notes: \_\_\_\_\_

#### Patient

##### Complaints

☐ None

☐ Neck Pain (where: \_\_\_\_\_)

☐ Paresthesia

Notes: \_\_\_\_\_

#### Physical Findings

##### Inspection:

☐ Normal

☐ Abnormal: \_\_\_\_\_

##### Palpation:

☐ Normal

☐ Point Tenderness

☐ Deformity

Notes: \_\_\_\_\_

##### Active Range of Motion:

☐ Full

☐ Limited: \_\_\_\_\_

Notes: \_\_\_\_\_

#### Imaging Studies [CT is Standard. Films acceptable only when CT is unavailable]

##### CT SCAN:

☐ Normal

☐ Abnormal: \_\_\_\_\_

Notes: \_\_\_\_\_

Lateral

☐ Normal

☐ Abnormal: \_\_\_\_\_

AP

☐ Normal

☐ Abnormal: \_\_\_\_\_

Odontoid

☐ Normal

☐ Abnormal: \_\_\_\_\_

**C L E A R A N C E**

The  
Cervical  
Spine is:

☐ **CLEAR** of significant injury and instability on the basis of the following:

☐ Normal exam in completely reliable patient with no need for imaging.

☐ Normal imaging of full C-Spine and normal exam.

☐ **NOT CLEAR** on the basis of the following:

☐ Neurological complaint or abnormal physical exam finding

☐ Abnormal imaging

☐ Unreliable patient at time of evacuation

Physician \_\_\_\_\_ / \_\_\_\_\_ MTF: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Print Name Signature

PATIENT'S IDENTIFICATION: (For typed or written entries give: Name – last, first, middle; ID No or SSN;  
Sex; Date of Birth; Rank/Grade)

JTTS Cervical Spine Clearance Note

Medical Record (Rev. May 2009)

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## APPENDIX D

### ADDITIONAL INFORMATION REGARDING OFF-LABEL USES IN CPGs

#### **A. Purpose.**

The purpose of this Appendix is to ensure an understanding of DoD policy and practice regarding inclusion in CPGs of “off-label” uses of U.S. Food and Drug Administration (FDA)–approved products. This applies to off-label uses with patients who are armed forces members.

#### **B. Background.**

Unapproved (i.e., “off-label”) uses of FDA-approved products are extremely common in American medicine and are usually not subject to any special regulations. However, under Federal law, in some circumstances, unapproved uses of approved drugs are subject to FDA regulations governing “investigational new drugs.” These circumstances include such uses as part of clinical trials, and in the military context, command required, unapproved uses. Some command requested unapproved uses may also be subject to special regulations.

#### **C. Additional Information Regarding Off-Label Uses in CPGs.**

The inclusion in CPGs of off-label uses is not a clinical trial, nor is it a command request or requirement. Further, it does not imply that the Military Health System requires that use by DoD health care practitioners or considers it to be the “standard of care.” Rather, the inclusion in CPGs of off-label uses is to inform the clinical judgment of the responsible health care practitioner by providing information regarding potential risks and benefits of treatment alternatives. The decision is for the clinical judgment of the responsible health care practitioner within the practitioner-patient relationship.

#### **D. Additional Procedures.**

**1. Balanced Discussion.** Consistent with this purpose, CPG discussions of off-label uses specifically state that they are uses not approved by the FDA. Further, such discussions are balanced in the presentation of appropriate clinical study data, including any such data that suggest caution in the use of the product and specifically including any FDA-issued warnings.

**2. Quality Assurance Monitoring.** With respect to such off-label uses, DoD procedure is to maintain a regular system of quality assurance monitoring of outcomes and known potential adverse events. For this reason, the importance of accurate clinical records is underscored.

**3. Information to Patients.** Good clinical practice includes the provision of appropriate information to patients. Each CPG discussing an unusual off-label use will address the issue of information to patients. When practicable, consideration will be given to including in an appendix an appropriate information sheet for distribution to patients, whether before or after use of the product. Information to patients should address in plain language: a) that the use is not approved by the FDA; b) the reasons why a DoD health care practitioner would decide to use the product for this purpose; and c) the potential risks associated with such use.