



Complete Summary

GUIDELINE TITLE

Determination of cervical spine stability in trauma patients (update of the 1997 EAST cervical spine clearance document).

BIBLIOGRAPHIC SOURCE(S)

Determination of cervical spine stability in trauma patients (update of the 1997 EAST cervical spine clearance document). Allentown (PA): Eastern Association for the Surgery of Trauma (EAST); 2000. 9 p. [17 references]

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT
CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Cervical spine injury

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management

CLINICAL SPECIALTY

Emergency Medicine
Neurological Surgery
Orthopedic Surgery
Radiology
Surgery

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To provide recommendations for identifying cervical spine injuries following trauma.

TARGET POPULATION

Trauma patients with suspected cervical spine injury

INTERVENTIONS AND PRACTICES CONSIDERED

Radiological studies of the cervical spine including:

1. Three-view cervical spine plain x-ray series (anteroposterior, lateral, and open mouth odontoid view), supplemented with axial computed tomography through suspicious or poorly visualized areas
2. Three-view cervical spine plain x-ray series plus swimmers if unable to visualize lower spine
3. Three-view cervical spine plain x-ray series plus trauma obliques
4. Axial computed tomography through C1-C2
5. Axial computed tomography through entire cervical spine
6. Magnetic resonance imaging of the entire cervical spine
7. Flexion/extension radiographs

Management:

1. High-dose methylprednisolone
2. Early decompression of mass lesions
3. Hemodynamic, respiratory and surgical stabilization
4. Immobilization of cervical spine in approved cervical spine collar

MAJOR OUTCOMES CONSIDERED

- Incidence of cervical spine injuries following blunt trauma
- Diagnostic utility of imaging studies for acute determination of cervical spine stability (i.e., sensitivity, specificity)

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Over a 2-year period, the Cervical Spine Clearance ad-hoc committee conducted an extensive review of the available English language literature and summarized its findings according to the format prescribed by the Guidelines Committee of the Eastern Association for the Surgery of Trauma.

Since 1995, 105 new publications were retrieved through a search of the National Library of Medicine using the search terms "cervical spine" and "trauma". Studies that were relevant to the issue of radiographically identifying cervical spine injuries were reviewed. In addition, the Committee solicited information from 37 major trauma centers in the United States regarding their current practice for clearance of the cervical spine in obtunded patients. Thirty-one centers responded, and the results of that survey also are presented in the guideline update.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The draft document is submitted to all members of the panel for review and modification. Subsequently the guidelines are forwarded to the chairmen of the Eastern Association of Trauma ad hoc committee for guideline development. Final modifications are made and the document is forwarded back to the individual panel chairpersons.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The following recommendations are a series of evidence-based guidelines for the safest and most effective means for identifying significant injuries of the cervical spine following trauma. Injuries which are most likely to lead to neurologic damage by causing or exacerbating trauma to the spinal cord are a particular focus, including bony, ligamentous, and other soft tissue abnormalities. Trauma patients at risk can be categorized according to their clinical presentation into 4 categories that are at special risk for various types of injuries, or at minimal or no risk for injury. The following guidelines are presented by category of patient and recommendations specific to that category are provided.

Radiologic clearance of the cervical spine should occur only after the hemodynamic, respiratory, and surgical stabilization of the patient. During such stabilization the cervical spine should be kept immobilized in an approved cervical spine collar.

(Note: See Addendum at end of the "Major Recommendations.")

1. Alert, awake, not intoxicated, neurologically normal, no midline neck pain or tenderness even with full range of motion of neck and palpation of cervical spine.

Guidelines:

- 1.1: Cervical spine x-rays are not necessary.
- 1.2: Attending level physician makes the determination, documents this in the medical record and removes the cervical spine collar.
Appropriate specialties: Emergency Medicine; Trauma Surgery; Orthopedic Spine; Surgery; Neurosurgery
- 1.3: Optimal timing: within 2 hours after admission to the Emergency Department.

Guideline-Prehospital:

Spine immobilization is indicated in the prehospital trauma patient who has sustained an injury with a mechanism having the potential for causing a spine injury and who has at least one of the following:

1. Altered mental status
2. Evidence of intoxication
3. A distracting painful injury (e.g., long bone extremity fracture)
4. Neurologic deficits
5. Spinal pain or palpation tenderness

2. Alert, awake, complaints of neck pain

Guidelines:

2.1: 3-view cervical spine x-rays are obtained.

2.2: Axial computed tomography images at 3 mm intervals obtained through suspicious areas identified on 3-view cervical spine x-rays.

2.3: If lower cervical spine is not adequately visualized on lateral cervical spine x-ray:

1. Swimmers view - if inadequate,
2. Axial computed tomography images at 3 mm intervals through lower cervical spine with sagittal reconstruction.

2.4: If 2.1-2.3 are normal, the cervical collar is removed and flexion/extension lateral cervical spine x-rays are obtained with the patient sitting and voluntarily flexing and extending their neck. Voluntary and painless excursion must exceed 30 degrees. Flexion/extension x-rays are done by the radiology technician under the supervision of the radiologist. No other physician or nurse needs to be present when they are obtained.

2.5: If voluntary, painless excursion during flexion/extension does not exceed 30 degrees, the cervical spine collar should be replaced and flexion/extension lateral cervical spine x-rays repeated in 2 weeks.

2.6: Optimal timing: within 4 hours of admission to the Emergency Department.

3. Neurologic deficits referable to a spine injury

Guidelines:

3.1: Plain films and computed tomography images as described in 2.1-2.3.

3.2: Magnetic resonance imaging of the cervical spine.

3.3: Optimal timing: within 2 hours of admission to the Emergency Department.

4. Altered mental status and return of normal mental status not anticipated for 2 days or more. (e.g., severe traumatic or hypoxic, ischemic brain injury).

Guidelines:

4.1: Plain films and computed tomography images as described in 2.1-2.3.

4.2: Axial computed tomography images at 3 mm intervals with sagittal reconstruction from the base of the occiput through C2.

4.3: If 4.1, 4.2 are normal, flexion/extension lateral cervical spine fluoroscopy with static images obtained at extremes of flexion and extension. Excursion of the neck is done by housestaff or attendings of:

1. Trauma Surgery
2. Neurosurgery
3. Orthopedic Spine Surgery

4.4: Optimal timing: within 48 hours of admission.

Addendum

1. 3-view cervical spine x-rays are defined as follows:
 - Lateral Cervical Spine Radiograph: must be of good quality and adequately visualize the base of the occiput to the upper part of the first thoracic vertebrae.
 - Anteroposterior Cervical Spine Radiograph: must reveal the spinous processes of C2 to C7.
 - Open Mouth Odontoid Radiograph: must visualize the entire dens and the lateral masses of C1.
2. For patients with neurologic deficits referable to a cervical spine injury (Category 3), and particularly those with normal plain films, it is extremely important to obtain a magnetic resonance imaging scan as soon as possible after admission to the Emergency Department. High dose methylprednisolone therapy started within, but not after, 8 hours of injury has been shown to improve outcome. Early decompression of mass lesions, such as traumatic herniated discs or epidural hematomas, is also likely to improve neurologic outcome.
3. The ultimate evaluation of all radiographic studies will be the responsibility of attending radiologists. However, attending level trauma surgeons, emergency medicine physicians, neurosurgeons, and orthopedic spine surgeons are considered qualified to properly interpret cervical spine radiographs. Based on that interpretation, their clinical evaluation of the patient, and after proper documentation in the patients' medical record, they may "clear" the cervical spine and remove the cervical spine collar.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

See the original guideline document for a detailed discussion of the updated literature supporting the current recommendations.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Safe and effective identification of significant injuries of the cervical spine following trauma.
- For patients with neurologic deficits referable to a cervical spine injury (Category 3), and particularly those with normal plain films, it is extremely important to obtain a magnetic resonance imaging scan as soon as possible after admission to the Emergency Department. High dose methylprednisolone therapy started within, but not after, 8 hours of injury has been shown to improve outcome. Early decompression of mass lesions, such as traumatic herniated discs or epidural hematomas, is also likely to improve neurologic outcome.

Subgroups Most Likely to Benefit:

Patients with injuries likely to lead to neurologic damage by causing or exacerbating trauma to the spinal cord, including bony, ligamentous, and other soft tissue abnormalities.

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

For those patients who are unable to reliably describe the presence or absence of neck pain there is persistent debate about the most appropriate studies for clearance of the cervical spine. There still has been no large prospective clinical trial assessing the sensitivity or specificity of any evaluation methods against a gold standard, so there is no Class I data (from prospective randomized controlled trials) on which to base a standard.

DESCRIPTION OF IMPLEMENTATION STRATEGY

The guideline developers make the following recommendations regarding implementation:

Implementation involves extensive education and inservicing of nursing, resident, and attending staff members and has one important guiding principle: the guidelines must be available to the clinicians in real time while they are actually seeing the patient. The two most common ways to apply these are by using either a critical pathway or a clinical management protocol. A critical pathway is a calendar of expected events that has been found to be very useful within designated diagnosis-related groups. In trauma, where there are multiple diagnosis-related groups used for one patient, pathways have not been found to be easily applied with the exception of isolated injuries. Clinical management protocols, on the other hand, are annotated algorithms that answer the "if, then" decision making problems and have been found to be easily applied to problem-, process-, or disease-related topics. The clinical management protocol consists of an introduction, an annotated algorithm and a reference page. The algorithm is a series of "if, then" decision making processes. There is a defined entry point followed by a clinical judgment and/or assessment, followed by actions, which are then followed by outcomes and/or endpoints. The advantages of algorithms are that they convey the scope of the guideline, while at the same time organize the decision making process in a user-friendly fashion. The algorithms themselves are systems of classification and identification that should summarize the recommendations contained within a guideline. It is felt that in the trauma and critical care setting, Clinical management protocols may be more easily applied than critical pathways, however, either is acceptable provided that the formulated guidelines are followed. After appropriate inservicing, a pretest of the planned guideline should be performed on a limited patient population in the clinical setting. This will serve to identify potential pitfalls. The pretest should include written documentation of experiences with the protocol, observation, and suggestions. Additionally, the guidelines will be forwarded to the chairpersons of the multi-institutional trials committees of the Eastern Association for the Surgery of Trauma, the Western Association for the Surgery of Trauma, and the American Association for the Surgery of Trauma. Appropriate guidelines can then be potentially selected for multi-institutional study. This process will facilitate the development of user friendly pathways or protocols as well as evaluation of the particular guidelines in an outcome based fashion.

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Determination of cervical spine stability in trauma patients (update of the 1997 EAST cervical spine clearance document). Allentown (PA): Eastern Association for the Surgery of Trauma (EAST); 2000. 9 p. [17 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000

GUIDELINE DEVELOPER(S)

Eastern Association for the Surgery of Trauma - Professional Association

SOURCE(S) OF FUNDING

Eastern Association for the Surgery of Trauma (EAST)

GUIDELINE COMMITTEE

Cervical Spine Clearance Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Committee Members: Donald Marion, Robert Domeier, C. Michael Dunham, Fred Luchette, Regis Haid

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline. It updates a previously issued guideline (EAST practice management guidelines for trauma. Allentown [PA]: Eastern Association for the Surgery of Trauma; 1998 Jan 23. pp. 33-49).

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available (in Portable Document Format [PDF]) from the [Eastern Association for the Surgery of Trauma \(EAST\) Web site](#).

Print copies: Available from the EAST Guidelines, c/o Fred A. Luchette, MD, Loyola University Medical Center, Department of Surgery Bldg. 110-3276, 2160 S. First Avenue, Maywood, IL 60153; Phone: (708) 327-2680; E-mail: fluchet@lumc.edu.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Practice Management Guidelines for Trauma: East Ad Hoc Committee on Guideline Development (Unabridged: Revised 1998 Mar 20). Available from the [Eastern Association for the Surgery of Trauma \(EAST\) Web site](#).

An excerpt is also available:

- Pasquale M, Fabian TC. Practice management guidelines for trauma from the Eastern Association for the Surgery of Trauma. J Trauma 1998 Jun;44(6):941-56; discussion 956-7.

Also available:

- Utilizing evidence based outcome measures to develop practice management guidelines: a primer. Allentown (PA): Eastern Association for the Surgery of Trauma; 2000. 18 p. Available from the [EAST Web site](#).

Print copies: Available from the EAST Guidelines, c/o Fred A. Luchette, MD, Loyola University Medical Center, Department of Surgery Bldg. 110-3276, 2160 S. First Avenue, Maywood, IL 60153; Phone: (708) 327-2680; E-mail: fluchet@lumc.edu.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on March 5, 2001. The information was verified by the guideline developer on May 4, 2001.

COPYRIGHT STATEMENT

This NGC summary is based on the original guideline, which is copyrighted by the Eastern Association for the Surgery of Trauma (EAST).

© 1998-2004 National Guideline Clearinghouse

Date Modified: 11/8/2004

FIRSTGOV

