



Complete Summary

GUIDELINE TITLE

Practice management guidelines for prophylactic antibiotic use in tube thoracostomy for traumatic hemopneumothorax.

BIBLIOGRAPHIC SOURCE(S)

Luchette FA, Barrie PS, Oswanski MF, Spain DA, Mullins CD, Palumbo F, Pasquale MD. Practice management guidelines for prophylactic antibiotic use in tube thoracostomy for traumatic hemopneumothorax. J Trauma 2000 Apr; 48(4):753-7. [26 references]

Practice management guidelines for prophylactic antibiotic use in tube thoracostomy for traumatic hemopneumothorax. Allentown (PA): Eastern Association for the Surgery of Trauma (EAST); 2000. 16 p. [26 references]

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INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT
CATEGORIES
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SCOPE

DISEASE/CONDITION(S)

Traumatic hemopneumothorax

GUIDELINE CATEGORY

Assessment of Therapeutic Effectiveness
Management
Prevention

CLINICAL SPECIALTY

Surgery
Thoracic Surgery

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To present recommendations on the use of prophylactic antibiotics in patients with traumatic hemopneumothorax undergoing tube thoracostomy.

TARGET POPULATION

Individuals with traumatic hemopneumothorax undergoing chest tube insertion (thoracostomy)

INTERVENTIONS AND PRACTICES CONSIDERED

1. Antibiotic prophylaxis
 - Cephalosporins (cefazolin, cefonicid, cephapirin, cefoxitin, cefamandole)
 - Clindamycin
 - Doxycycline
 - Ampicillin
2. Duration of antibiotic therapy (24 hours versus >24 hours)

MAJOR OUTCOMES CONSIDERED

Incidence of:

- Pneumonia
- Empyema
- Wound infections
- Tracheitis
- Effusion

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

A MEDLINE search for the past 20 years (1977-1997) was performed. The following subject words were used for the query: antibiotic prophylaxis; chest tubes; human; drainage; tube thoracostomy; infection; empyema; and bacterial

infection-prevention and control. This search identified 44 references in the English language. The bibliographies of each article were searched for additional references not identified by the original MEDLINE query. Letters to the editor, case reports, and review articles were excluded from further evaluation. Eleven articles were identified for inclusion in the evidentiary review; nine were prospective series and two were meta-analyses.

NUMBER OF SOURCE DOCUMENTS

44 source documents

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Evidence Classification Scheme:

Class I: Prospective, Randomized, Double-Blinded Study

Class II: Prospective, Randomized, Non-Blinded Trial

Class III: Retrospective Analysis of Patient Series

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The articles retrieved by the literature search were reviewed by four trauma surgeons and pharmaceutical outcome researchers with interest in pharmacokinetics and health care economics who collaborated to produce these guidelines.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Level I: This recommendation is convincingly justifiable based on the available scientific information alone. It is usually based on Class I data, however, strong Class II evidence may form the basis for a level 1 recommendation, especially if the issue does not lend itself to testing in a randomized format. Conversely, weak or contradictory Class I data may not be able to support a level 1 recommendation.

Level II: This recommendation is reasonably justifiable by available scientific evidence and strongly supported by expert critical care opinion. It is usually supported by Class II data or a preponderance of Class III evidence.

Level III: The recommendation is supported by available data but adequate scientific evidence is lacking. This recommendation is generally supported by Class III data. This type of recommendation is useful for educational purposes and in guiding future clinical research.

COST ANALYSIS

Cost is a major concern in the current health care market. Only two groups of researchers performed a cost analysis. One group claimed that prophylactic antibiotics resulted in a 0.9 day reduction in length of hospital stay. At the time of that study, the wholesale cost for 1 gm cefonicid was \$26.10. The treated patients received an average of 5 doses of that agent. The daily hospital cost quoted was \$688 in government-run institutions and \$820 in private, for-profit facilities. They concluded that there was a potential direct medical cost offset of \$488 to \$607 per patient excluding the cost of drug administration. Thus, depending on the amount of direct cost for a specific antibiotic and the duration of prophylaxis, there may be a net increase in direct medical cost associated with prophylactic antibiotic treatment. When indirect costs are included there are overall cost savings; however this may be negligible. In summary, there are inadequate data to support any recommendations on cost analysis for prophylactic antibiotics.

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

Level I-III recommendations, and the class of data grading (I-III) are defined at the end of the "Major Recommendations" field.

Multiple factors contribute to the development of posttraumatic empyema. These factors include the conditions under which the tube is inserted (emergent or urgent), the mechanism of injury, retained hemothorax, and ventilator care. The incidence of empyema in placebo groups ranges between 0% and 18%. The administration of antibiotics for longer than 24 hours did not appear to significantly reduce this risk compared with a shorter duration, although the numbers in each series were small. Most reports found a significant reduction in pneumonitis when patients received prolonged prophylactic antibiotics. This use of antibiotics might possibly be better described as presumptive therapy rather than prophylactic.

A. Level I Recommendations

There are insufficient data to support a Level I recommendation as a standard of care.

B. Level II Recommendations

There are insufficient data to suggest prophylactic antibiotics reduce the incidence of empyema.

C. Level III Recommendations

There are sufficient Class I and II data to recommend prophylactic antibiotic use in patients receiving tube thoracostomy following chest trauma. A first generation cephalosporin should be used for no longer than 24 hours. The data suggest there may be a reduction in the incidence of pneumonia but not empyema in trauma patients receiving prophylactic antibiotics when a tube thoracostomy is placed.

Definitions:

Recommendation Scheme:

Level I: The recommendation is convincingly justifiable based on the available scientific information alone. This recommendation is usually based on Class I data, however, strong Class II evidence may form the basis for a level 1 recommendation, especially if the issue does not lend itself to testing in a randomized format. Conversely, low quality or contradictory Class I data may not be able to support a level 1 recommendation.

Level II: The recommendation is reasonably justifiable by available scientific evidence and strongly supported by expert opinion. This recommendation is usually supported by Class II data or a preponderance of Class III evidence.

Level III: The recommendation is supported by available data but adequate scientific evidence is lacking. This recommendation is generally supported by Class III data. This type of recommendation is useful for educational purposes and in guiding future clinical research.

Classification Scheme:

Class I: Prospective, randomly assigned, double-blinded study

Class II: Prospective, randomly assigned, non-blinded trial

Class III: Retrospective series of patients or meta-analysis

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Conclusions were based on evidence obtained from prospective, randomly assigned, double-blinded studies (Class I); prospective, randomly assigned, non-blinded studies (Class II); or retrospective series of patients or meta-analysis (Class III). The evidentiary tables included 4 class I articles, 5 Class II articles, and 2 Class III articles.

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Reduced incidence of pneumonia and its associated morbidity in injured patients requiring tube thoracostomy.

POTENTIAL HARMS

Not stated

IMPLEMENTATION OF THE GUIDELINE

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.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

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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

EAST Practice Management Guidelines Work Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Workgroup Members: Fred A. Luchette, MD; Philip S. Barrie, MD; Michael F. Oswanski, MD; David A. Spain, MD; C. Daniel Mullins, PhD; Francis Palumbo, PhD, JD; Michael D. Pasquale, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available (in Portable Document Format [PDF] format) 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 9, 2001. The information was verified by the guideline developer on May 4, 2001.

COPYRIGHT STATEMENT

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