



## Complete Summary

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### **GUIDELINE TITLE**

Antibiotic prophylaxis in cardiac surgery.

### **BIBLIOGRAPHIC SOURCE(S)**

Society of Thoracic Surgeons Workforce on Evidence Based Surgery. Antibiotic prophylaxis in cardiac surgery. Part 1, duration of prophylaxis. Chicago (IL): Society of Thoracic Surgeons; 2005. 20 p. [56 references]

### **GUIDELINE STATUS**

This is the current release of the guideline.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### **DISEASE/CONDITION(S)**

Postoperative infection following cardiac surgery

### **GUIDELINE CATEGORY**

Prevention

### **CLINICAL SPECIALTY**

Cardiology  
Infectious Diseases  
Internal Medicine  
Thoracic Surgery

## **INTENDED USERS**

Physicians

## **GUIDELINE OBJECTIVE(S)**

To provide guidelines on the duration of antibiotic prophylaxis in adult patients undergoing cardiac surgery by answering the following key questions:

- Does the duration of antibiotic prophylaxis influence the probability of developing antibiotic-resistant bacteria?
  - If so, at what postoperative time does this become clinically significant?
- Does the duration of antibiotic prophylaxis influence the incidence of surgical-site infection (SSI)?
  - If so, at what postoperative time does this become clinically significant?

## **TARGET POPULATION**

Adult patients undergoing cardiac surgery

**Note:** The following patients are excluded from the analysis: patients with active preoperative infections, those undergoing cardiac transplantation, patients on immunosuppressive therapy, patients having aortic replacement surgery, and those undergoing off-pump cardiac surgery.

## **INTERVENTIONS AND PRACTICES CONSIDERED**

### **Prophylactic Intravenous Antibiotics**

1. Single-dose (24 hour) or multiple dose (48 hour) prophylaxis
2. Duration of antibiotic administration (<48 hours; 48 hours; >48 hours)

## **MAJOR OUTCOMES CONSIDERED**

- Surgical-site infections (SSI) including:
  - Soft tissue sternal infections
  - Suppurative mediastinitis
- Antibiotic resistance

## **METHODOLOGY**

### **METHODS USED TO COLLECT/SELECT EVIDENCE**

Searches of Electronic Databases

### **DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE**

Not stated

## **NUMBER OF SOURCE DOCUMENTS**

Not stated

## **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**

### **Levels of Evidence**

**Level A:** Data derived from multiple randomized clinical trials

**Level B:** Data derived from a single randomized trial or from nonrandomized trials

**Level C:** Consensus expert opinion

## **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**

Not stated

## **RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

### **Classification of Recommendations**

**Class I:** Conditions for which there is evidence and/or general agreement that a given procedure is useful and effective

**Class II:** Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure

**IIa:** Weight of evidence favors usefulness/efficacy

**IIb:** Usefulness/efficacy is less well established by evidence.

**Class III:** Conditions for which there is evidence and/or general agreement that the procedure is not useful/effective

## **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**

Not stated

# **RECOMMENDATIONS**

## **MAJOR RECOMMENDATIONS**

The levels of evidence (A-C) and classification of recommendations (I-III) are defined at the end of the "Major Recommendations" field.

### **Antimicrobial Resistance**

**Guideline Panel Conclusion:** The duration of a prophylactic antibiotic regimen is directly related to the probability of developing resistant microorganisms.

**Optimal Practice:** The duration of a prophylactic antibiotic regimen is limited to the shortest amount of time required to effectively minimize the probability of postoperative infection. **Class IIa. Level B.**

### **Surgical Site Infection**

#### **1. Chest Tubes and Antibiotic Prophylaxis**

- **Guideline Panel Conclusion:** The duration of antibiotic prophylaxis should not be dependent on indwelling catheters of any type.
- **Optimal Practice:** Decisions regarding the continuation of antibiotic prophylaxis are not guided by the presence of indwelling catheters. **Class IIb. Level C.**

#### **2. Single-dose prophylaxis**

- **Guideline Panel Conclusion:** Single dose antibiotic prophylaxis may be effective in cardiac surgery, but there are inconclusive data to confirm this effectiveness. There is insufficient evidence to recommend use of single-dose prophylaxis in cardiac surgery.
- **Optimal Practice:** Single-dose prophylaxis is used in circumstances the surgeon considers optimal for patient care. **Class IIa. Level B.**

#### **3. Prophylaxis for 48 hours**

- **Guideline Panel Conclusion:** Antibiotic prophylaxis of up to 48 hours duration is unlikely to produce antibiotic resistance.
- **Guideline Panel Conclusion:** Antibiotic prophylaxis of 48 hours duration is clinically effective in minimizing infectious complications in cardiac surgery.
- **Guideline Panel Conclusion:** Antibiotic prophylaxis of 48 hours duration may be as effective as prophylaxis administered for longer than 48 hours.

### **Summary Conclusions**

There is evidence indicating that antibiotic prophylaxis of 48 hours duration is effective. There is some evidence that single-dose prophylaxis or 24-hour prophylaxis may be as effective as 48-hour prophylaxis, but additional studies are necessary before confirming the effectiveness of prophylaxis lasting less than 48 hours. There is no evidence that prophylaxis administered for longer than 48 hours is more effective than a 48-hour regimen.

**Optimal Practice:** Antibiotic prophylaxis is not continued for more than 48 hours postoperatively. **Class IIa. Level B.**

### **Definitions:**

#### **Levels of Evidence**

**Level A:** Data derived from multiple randomized clinical trials

**Level B:** Data derived from a single randomized trial or from nonrandomized trials

**Level C:** Consensus expert opinion

#### **Classification of Recommendations**

**Class I:** Conditions for which there is evidence and/or general agreement that a given procedure is useful and effective

**Class II:** Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure

**IIa:** Weight of evidence favors usefulness/efficacy.

**IIb:** Usefulness/efficacy is less well established by evidence.

**Class III:** Conditions for which there is evidence and/or general agreement that the procedure is not useful/effective

### **CLINICAL ALGORITHM(S)**

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence is identified and graded for some recommendations (see "Major Recommendations" field).

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

Use of appropriate duration of a prophylactic antibiotic regimen in patients undergoing cardiac surgery will minimize surgical site infection and the development of antibiotic resistance.

### POTENTIAL HARMS

Not stated

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

- These guidelines should not be considered inclusive of all proper methods of care or exclusive of other methods of care reasonably directed at obtaining the same results. Moreover, these guidelines are subject to change over time, without notice. The ultimate judgment regarding the care of a particular patient must be made by the physician in light of the individual circumstances presented by the patient.
- Members of The Society of Thoracic Surgeons (STS) have always placed the interests and welfare of their patients above all other considerations. Accordingly, the STS has an obligation to critically examine the evidence to ensure that the management decisions are consistent with optimal patient care. This is precisely the role of STS practice guidelines.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

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

### IOM CARE NEED

Getting Better  
Staying Healthy

## **IOM DOMAIN**

Effectiveness

## **IDENTIFYING INFORMATION AND AVAILABILITY**

### **BIBLIOGRAPHIC SOURCE(S)**

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### **ADAPTATION**

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

### **DATE RELEASED**

2005

### **GUIDELINE DEVELOPER(S)**

Society of Thoracic Surgeons - Medical Specialty Society

### **SOURCE(S) OF FUNDING**

Society of Thoracic Surgeons

### **GUIDELINE COMMITTEE**

Workforce on Evidence Based Surgery

### **COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE**

Not stated

### **FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

Not stated

### **GUIDELINE STATUS**

This is the current release of the guideline.

### **GUIDELINE AVAILABILITY**

Electronic copies: Available in Portable Document Format (PDF) from the [Society of Thoracic Surgeons Web site](#).

Print copies: Available from The Society of Thoracic Surgeons, 633 N. Saint Clair St., Suite 2320, Chicago, IL, USA 60611-3658

#### **AVAILABILITY OF COMPANION DOCUMENTS**

None available

#### **PATIENT RESOURCES**

None available

#### **NGC STATUS**

This NGC summary was completed by ECRI on July 28, 2005.

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