Complete Summary

GUIDELINE TITLE

Guidelines for the prevention of intravascular catheter-related infections: recommendations relevant to interventional radiology.

BIBLIOGRAPHIC SOURCE(S)

Miller DL, O'Grady NP. Guidelines for the prevention of intravascular catheter-related infections: recommendations relevant to interventional radiology. J Vasc Interv Radiol 2003 Sep;14(9 Pt 2):S355-8. [33 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Intravascular catheter-related infections

GUIDELINE CATEGORY

Prevention

CLINICAL SPECIALTY

Infectious Diseases
Internal Medicine
Pediatrics
Radiology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To provide evidence-based recommendations for preventing catheter-related infections that are particularly relevant to interventional radiology

TARGET POPULATION

Patients (adults and children) at risk for catheter-related infection

INTERVENTIONS AND PRACTICES CONSIDERED

1. Catheter selection (e.g., use of peripherally inserted central catheter or tunneled central venous catheter [CVC]; use of CVC with minimum number of ports or lumens)
2. Modification of catheter insertion site
3. Aseptic technique
    - Use of caps, masks, sterile gowns, gloves, large sterile sheet for CVC insertion
    - Site preparation (2% chlorhexidine, tincture of iodine, 70% alcohol)
4. Use of antimicrobial or antiseptic impregnated catheters and cuffs
5. Use of topical antibiotics ointments or creams (not recommended except when using dialysis catheters)
6. Use of sutureless fixation devices for catheters
7. Replacement of CVC (not recommended routinely)
8. Use of guidewire techniques (not recommended)
9. Avoidance of catheters for hemodialysis
10. Use of cuffed CVC for hemodialysis
11. Use of CVC in children

MAJOR OUTCOMES CONSIDERED

Incidence of and risk for catheter-related infection

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

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Other

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Selected recommendations were taken verbatim from the following source:

Centers for Disease Control. Guidelines for the prevention of intravascular catheter-related infections. MMWR Morb Mortal Wkly Rep 2002; 51 (No.RR 10):1–36.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

In the United States, the estimated attributable cost per infection in the intensive care unit (ICU) is $35,000 –$56,000. For entire hospitals, as opposed to ICUs only, 250,000 cases of central venous catheter (CVC)-associated bloodstream infections have been estimated to occur annually in the United States. In this case, attributable mortality is an estimated 12%–25% for each infection, and the marginal cost to the health-care system is $25,000 per episode.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The draft document is critically reviewed by members of the Standards of Practice Committee via conference call and/or face-to-face meetings. Once the Committee finalizes the draft it is circulated to the SIR membership for further input/criticism during a 30-day comment period. These comments are reviewed and discussed by the Committee and appropriate revisions made to create the finished standards document. Prior to its publication the document is approved by the SIR Executive Council.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Pathogenesis

Recommendations

- Use a central venous catheter (CVC) with the minimum number of ports or lumens essential for the management of the patient.
- Use totally implantable access devices for patients who require long-term, intermittent vascular access. For patients requiring frequent or continuous access, a peripherally inserted central catheter (PICC) or tunneled CVC is preferable.

Site of Catheter Insertion

Recommendations

- Weigh the risks and benefits of placing a device at a recommended site to reduce infectious complications against the risk for mechanical complications (e.g., pneumothorax, subclavian artery puncture, subclavian vein laceration, subclavian vein stenosis, hemothorax, thrombosis, air embolism, and catheter misplacement).
- Use a subclavian site (rather than a jugular or femoral site) in adult patients to minimize infection risk for nontunneled CVC placement.
- No recommendation can be made for a preferred site of insertion to minimize infection risk for a tunneled CVC.
- Place catheters used for hemodialysis and pheresis in a jugular or femoral vein rather than a subclavian vein to avoid venous stenosis if catheter access is needed.

Aseptic Technique

Recommendations

- Use aseptic technique including the use of a cap, mask, sterile gown, sterile gloves, and a large sterile sheet for the insertion of CVCs (including PICCs) or guide-wire exchange.
- Although a 2% chlorhexidine-based preparation is preferred, tincture of iodine, an iodophor, or 70% alcohol may be used. Allow the antiseptic to remain on the insertion site and to air dry before catheter insertion. Allow

povidone iodine to remain on the skin for at least 2 minutes, or longer if it is not yet dry before insertion.

Antimicrobial- or Antiseptic-Impregnated Catheters and Cuffs

Recommendations

- Use an antimicrobial- or antiseptic-impregnated CVC in adults whose catheter is expected to remain in place >5 days if, after implementing a comprehensive strategy to reduce rates of catheter-related blood stream infections (CR-BSI), the CR-BSI rate remains above the goal set by the individual institution based on benchmark rates and local factors.

Catheter Fixation and Dressing

Recommendations

- Do not use topical antibiotic ointment or creams on insertion sites (except when using dialysis catheters) because of their potential to promote fungal infections and antimicrobial resistance.
- Tunneled CVC sites that are well healed may not require dressings.

Central Venous Catheter Replacement

Recommendations

- Do not routinely replace CVCs, PICCs, hemodialysis catheters, or pulmonary artery catheters to prevent catheter-related infections.
- Do not remove CVCs or PICCs on the basis of fever alone. Use clinical judgment regarding the appropriateness of removing the catheter if infection is evidenced elsewhere or if a noninfectious cause of fever is suspected.
- Do not use guide-wire techniques to replace catheters in patients suspected of having catheter-related infection.

Hemodialysis Catheters

Hemodialysis catheters should be avoided in favor of arteriovenous fistulas and grafts. If temporary access is needed for dialysis, a cuffed catheter is preferable to a noncuffed catheter if the catheter is expected to stay in place for longer than 3 weeks.

Recommendations

- Use a cuffed CVC for dialysis if the period of temporary access is anticipated to be prolonged (e.g., >3 weeks).

Central Venous Catheters in Children

Because of the limited vascular sites in children, attention should be given to the frequency with which catheters are replaced in these patients. In a study in which survival analysis techniques were used to examine the relationship between the

duration of central venous catheterization and complications in pediatric patients in the ICU, all patients studied (n = 397) remained without infection for a median of 23.7 days. In addition, no relationship was found between duration of catheterization and the daily probability of infection (r = 0.21, P = .1), suggesting that routine replacement of CVCs likely does not reduce the incidence of catheter-related infection.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not specifically stated. See the original guideline document for selected supporting data, background information, and references.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Appropriate selection, placement, maintenance, and replacement of catheters used for venous access
- Improved patient outcome and decreased health-care costs by reducing the infectious complications associated with intravascular catheter use

POTENTIAL HARMS

- Although mupirocin ointment reduced the risk of catheter-related bloodstream infection, it has also been associated with mupirocin resistance and may adversely affect the integrity of polyurethane catheters.
- In adult patients, a subclavian site is preferred for infection-control purposes, even though other factors (e.g., the potential for mechanical complications, risk of subclavian vein stenosis, and catheter operator skill) must be considered when deciding where to place the catheter.

QUALIFYING STATEMENTS

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The opinions expressed herein are those of the authors and do not necessarily reflect those of the United States Navy, the Department of Defense, or the Department of Health and Human Services.

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

Staying Healthy

IOM DOMAIN

Efficiency
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

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DATE RELEASED

2003 Sep

GUIDELINE DEVELOPER(S)

Society of Interventional Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

Society of Interventional Radiology

GUIDELINE COMMITTEE

Standards of Practice Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Primary Authors: Donald L. Miller, MD; Naomi P. O´Grady, MD

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 Interventional Radiology Web site.

Print copies: Available from the Society of Interventional Radiology, 10201 Lee Highway, Suite 500, Fairfax, VA 22030

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

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