



## Complete Summary

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### GUIDELINE TITLE

Skeletal pin site care.

### BIBLIOGRAPHIC SOURCE(S)

Holmes SB, Brown SJ. Skeletal pin site care: National Association of Orthopaedic Nurses guidelines for orthopaedic nursing. Orthop Nurs 2005 Mar-Apr;24(2):99-107. [17 references] [PubMed](#)

### GUIDELINE STATUS

This is the current release of the guideline.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

- Conditions requiring skeletal pin site care
- Pin site infection

### GUIDELINE CATEGORY

Evaluation  
Management  
Prevention  
Risk Assessment

### CLINICAL SPECIALTY

Nursing  
Orthopedic Surgery

## **INTENDED USERS**

Advanced Practice Nurses  
Hospitals  
Nurses

## **GUIDELINE OBJECTIVE(S)**

- To serve as a supporting framework for evidence-based nursing practice
- To assist nurses with decision making about care for specific clinical situations
- To present evidence-based recommendations for the care of the skin immediately surrounding the skeletal pin

## **TARGET POPULATION**

Patients with or at risk of pin site infection

## **INTERVENTIONS AND PRACTICES CONSIDERED**

1. Assessment of infection risk based on pin site location
2. Daily or weekly pin site care for sites with mechanically stable bone-pin interfaces after the first 48 to 72 hours
3. Chlorhexidine cleansing (versus other methods of cleansing or no cleansing)
4. Patient and family education before discharge about pin site care and signs and symptoms of infection

**Note:** The following measures were considered but not recommended because of lack of evidence and/or panel consensus:

- Use of a standardized system to define infections
- Pin site care versus no pin site care
- Showering
- Management of crusts
- Massage to release skin adherence to the pin
- Use of dressings

## **MAJOR OUTCOMES CONSIDERED**

- Pin site infection rates (as measured by clinical signs, culture counts, infection classification, need for antibiotics, or need for hospital admission)
- Risk factors for pin site infection

## **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**

The research evidence regarding the effectiveness of various nursing actions aimed at minimizing pin site infection is scant. The CINAHL and MEDLINE databases from 1995 through mid-2004 were searched, reference lists were combed, and experts contacted. Only seven studies were found that explicitly linked a pin site care method to an infection rate. Two of these studies used a randomized experimental design (see Table 1 in the original guideline document), and five used case series designs (see Table 2 in the original guideline document).

## **NUMBER OF SOURCE DOCUMENTS**

Seven studies

## **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 Support**

**Level 1:** supported by main finding from one randomized, experimental study with a statistically significant difference in group outcomes

**Level 2:** supported by one comparative case series study with a statistically significant difference in group outcomes

**Level 3:** supported by a descriptive finding of at least one single case series study

**Level 4:** reported as an incidental finding in at least one study and endorsed by two thirds of the panel

**Level 5:** supported by endorsement of two thirds of the panel

## **METHODS USED TO ANALYZE THE EVIDENCE**

Meta-Analysis  
Systematic Review with Evidence Tables

## **DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE**

A systematic analysis of the research literature on skeletal pin site care was conducted, and the opinions of an expert panel were obtained.

Although there were two experimental studies regarding pin site care, they addressed different aspect of care. One study addressed cleansing solutions and the other study addressed the frequency of site care. The methodologic quality of the first study was judged by widely accepted criteria to be fair and the other study to be good. Of the five case series studies, one reported a comparison of two methods of pin site care; it was judged to be of high quality. The other four studies reported on only one method of pin site care.

Beyond the issue of the two experimental studies addressing different aspects of site care is the fact that the populations studied were quite diverse. In all seven studies, patients had external fixators of some type but were diverse in age and condition being treated.

None of these studies examined fixator pins in multi-trauma patients or in patients with pelvic fractures, upper extremity problems, or Halo braces. Thus, the universe of populations treated with skeletal pins is not represented in the research literature.

The studies were diverse in other ways:

- Pin site infection was not consistently defined.
- Pin site infection rates were reported on different basis (i.e., by pins, by fixators, and by patients). This variation made comparisons of infection difficult.
- Most of the studies did not clearly report antibiotic protocols.
- The length of time fixators were in place varied widely, as did the type of hardware and whether corrections were carried out. The length of hospital stay was not included in most study reports.

*The combination of the diverse nature of the research evidence and the weak designs used lead the authors to conclude that there is insufficient evidence on which to recommend pin site care as beneficial in any way or to make strong recommendations regarding any particular aspect of pin site care. Nevertheless, the research evidence does provide a basis for recommending several specific actions over others until more definitive answers become available.*

Recognizing that clinicians must have a clinical approach for dealing with pin sites, the authors decided to go beyond the main findings of the studies to also glean incidental findings from the studies. To include incidental findings in the evaluation of the evidence, a Levels of Evidence Support categorization system that recognized them was developed. The rationale for this approach was that a unique Levels of Evidence Support system would capture the subtle differences which were reviewed by the panel, amended, and then finalized. This process resulted in three recommendations that have some research support and one that has strong expert panel support. For each recommendation, the level of supporting evidence is explicitly stated and the research evidence and panel opinion are briefly described.

## **METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Expert Consensus

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

In round-1 review, the five-member expert panel rated the level of evidence for each issue and indicated the issues for which they would have liked to offer a recommendation. In round 2, they provided a more specific opinion about whether a recommendation could be offered, given the level of research evidence and the expert opinion submitted in round 1. The input from these two rounds was used to draft the recommendations.

## 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

Internal Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The recommendations were reviewed by the panel, amended, and then finalized.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

The levels of evidence support (1-5) definitions are provided at the end of "Major Recommendations" field.

1. Pins located in areas with considerable soft tissue should be considered at greater risk for infection.

***Levels of support: 3, 4, and 5***

2. After the first 48 to 72 hours (when drainage may be heavy), pin site care should be done daily or weekly for sites with mechanically stable bone-pin interfaces.

***Levels of support: 1 and 5***

3. Chlorhexidine 2-mg/mL solution may be the most effective cleansing solution for pin site care.

***Level of support: 2***

4. Patients and/or their families should be taught pin site care before discharge from the hospital. They should be required to demonstrate whatever care needs to be done and should be provided with written instructions that include signs and symptoms of infection.

***Level of support: 5***

**Definitions:**

**Levels of Evidence Support**

**Level 1:** supported by main finding from one randomized, experimental study with a statistically significant difference in group outcomes

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**Level 5:** supported by endorsement of two thirds of the panel

**CLINICAL ALGORITHM(S)**

None provided

**EVIDENCE SUPPORTING THE RECOMMENDATIONS**

**TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS**

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

**BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS**

**POTENTIAL BENEFITS**

- Identification of pin sites at greater risk of infection
- Appropriate nursing management of the skin immediately surrounding the skeletal pin
- Prevention or minimization of the risk of pin site infection

**POTENTIAL HARMS**

Not stated

## QUALIFYING STATEMENTS

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- The National Association of Orthopaedic Nurses has made every attempt to ensure the accuracy of the information contained herein. As new research and clinical experience broadens our knowledge, changes in approaches, strategies, and interventions will be required.
- Recommended interventions must be individualized to each situation. No liability for any injury or damage whatsoever in connection with the treatments discussed is assumed. This document makes recommendations for orthopaedic nursing practice. Orthopaedic nurses should then use clinical decision making to plan individual orthopaedic patient care while using these recommendations.
- There is little research evidence on which to base the management of skeletal pin sites. The authors identified no studies that directly examined the effectiveness of pin site care versus no special care to the site; thus, whether pin site care reduces infections is unknown. Because the research base is scant, the authors offer few recommendations. Even those offered are stated tentatively because the research evidence supporting them is from a single study at one site and included patients with a limited range of problems. Thus, the applicability of the recommendations to the universe of pin site conditions cannot be assumed.

## 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  
Patient-centeredness

## 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 Mar/Apr

## **GUIDELINE DEVELOPER(S)**

National Association of Orthopedic Nurses - Private Nonprofit Research Organization

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

National Association of Orthopedic Nurses

## **GUIDELINE COMMITTEE**

Pin Site Care Expert Panel

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

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## **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 [National Association of Orthopedic Nurses Web site](#).

Print copies: Available from the National Association of Orthopedic Nurses National Office, 401 N. Michigan Avenue, Suite 2200, Chicago, IL 60611, Phone: 800-289-NAON (6266)

## **AVAILABILITY OF COMPANION DOCUMENTS**



None available

## **PATIENT RESOURCES**

None available

## **NGC STATUS**

This NGC summary was completed by ECRI on August 12, 2005. The information was verified by the guideline developer on September 27, 2005.

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