Complete Summary

GUIDELINE TITLE

Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings 2007. Protective environment.

BIBLIOGRAPHIC SOURCE(S)

Siegel JD, Rhinehart E, Jackson M, Chiarello L, Healthcare Infection Control Practices Advisory Committee. 2007 guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings. Protective environment. Atlanta (GA): Centers for Disease Control and Prevention (CDC); 2007 Jun. 2 p.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Centers for Disease Control and Prevention (CDC), Hospital Infection Control Practices Advisory Committee. Guidelines for isolation precautions in hospital infection control advisory committee. Atlanta (GA): Centers for Disease Control and Prevention (CDC); 1996 Jan 1. 38 p. (CDC prevention guidelines; no. 1/96). [97 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Healthcare-associated infections

GUIDELINE CATEGORY

Prevention

CLINICAL SPECIALTY

Infectious Diseases
Nursing
Preventive Medicine

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Hospitals
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To provide infection control recommendations for all components of the healthcare delivery system, including hospitals, long-term care facilities, ambulatory care, home care and hospice
- To reaffirm Standard Precautions as the foundation for preventing transmission during patient care in all healthcare settings
- To reaffirm the importance of implementing Transmission-Based Precautions based on the clinical presentation or syndrome and likely pathogens until the infectious etiology has been determined
- To provide epidemiologically sound and, whenever possible, evidence-based recommendations

TARGET POPULATION

Patients and healthcare personnel in all settings where healthcare is delivered

INTERVENTIONS AND PRACTICES CONSIDERED

Use of a protective environment for infection control, including the use of standard and transmission-based precautions in a protective environment

MAJOR OUTCOMES CONSIDERED

- Risk of environmental fungi infection
- Rate of aspergillus outbreaks

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Med-line and Pub Med were used to search for relevant studies published in English, focusing on those published since 1996.

The quality of studies, consistency of results and correlation with results from randomized, controlled trials when available were considered during the literature review and assignment of evidence-based categories to the recommendations in this guideline.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The recommendations are categorized on the basis of existing scientific data, theoretical rational, applicability, and when possible, economic impact, as follows:

Category IA. Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies.

Category IB. Strongly recommended for implementation and supported by some experimental, clinical, or epidemiologic studies and a strong theoretical rationale.

Category IC. Required for implementation, as mandated by federal and/or state regulation or standard.

Category II. Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale.

No recommendation; unresolved issue. Practices for which insufficient evidence or consensus regarding efficacy exists.

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

Definitions for the strength of recommendation grading (IA-IC, II, and no recommendation) are provided at the end of the "Major Recommendations" field.

Protective Environment (see Table 4 in the original guideline document)

VI.A. Place allogeneic hematopoietic stem cell transplant (HSCT) patients in a Protective Environment as described in the "Guideline to Prevent Opportunistic Infections in HSCT Patients" ("Guidelines for preventing," 2000), the "Guideline for Environmental Infection Control in Health-Care Facilities" (Sehulster & Chinn, 2003), and the "Guidelines for Preventing Health-Care-Associated Pneumonia, 2003" (Tablan et al., 2004) to reduce exposure to environmental fungi (e.g., *Aspergillus* sp) (Humphreys, 2004; Thio et al., 2000). **Category IB**

VI.B. No recommendation for placing patients with other medical conditions that are associated with increased risk for environmental fungal infections (e.g., aspergillosis) in a Protective Environment (Sehulster & Chinn, 2003). **Unresolved issue**

VI.C. For patients who require a Protective Environment, implement the following (see Table 5 in the original guideline document) (Sehulster & Chinn, 2003; "Guidelines for preventing," 2000)

VI.C.1. Environmental controls

VI.C.1.a. Filtered incoming air using central or point-of-use high efficiency particulate (HEPA) filters capable of removing 99.97% of particles $\geq$0.3 micrometers in

diameter (American Institute of Architects [AIA], 2006). **Category IB**

VI.C.1.b. Directed room airflow with the air supply on one side of the room that moves air across the patient bed and out through an exhaust on the opposite side of the room (AIA, 2006). **Category IB**

VI.C.1.c. Positive air pressure in room relative to the corridor (pressure differential of $\geq$12.5 Pa [0.01-in water gauge]) (AIA, 2006). **Category IB**

VI.C.1.c.i. Monitor air pressure daily with visual indicators (e.g., smoke tubes, flutter strips) (Sehulster & Chinn, 2003; Rice, Streifel, & Vesley, 2001). **Category IA**

VI.C.1.d. Well-sealed rooms that prevent infiltration of outside air (AIA, 2006). **Category IB**

VI.C.1.e. At least 12 air changes per hour (AIA, 2006). **Category IB**

VI.C.2. Lower dust levels by using smooth, nonporous surfaces and finishes that can be scrubbed, rather than textured material (e.g., upholstery). Wet dust horizontal surfaces whenever dust is detected and routinely clean crevices and sprinkler heads where dust may accumulate (Noskin et al., 2000; Gerson et al., 1994). **Category II**

VI.C.3. Avoid carpeting in hallways and patient rooms in areas (Gerson et al., 1994). **Category IB**

VI.C.4. Prohibit dried and fresh flowers and potted plants (Taplin & Mertz, 1973; Walsh & Dixon, 1989; Lass-Florl et al., 2000). **Category II**

VI.D. Minimize the length of time that patients who require a Protective Environment are outside their rooms for diagnostic procedures and other activities (Sehulster & Chinn, 2003; Thio et al., 2000; Raad et al., 2002). **Category IB**

VI.E. During periods of construction, to prevent inhalation of respirable particles that could contain infectious spores, provide respiratory protection (e.g., N95 respirator) to patients who are medically fit to tolerate a respirator when they are required to leave the Protective Environment (Raad et al., 2002; Thio et al., 2000). **Category II**

VI.E.1. No recommendation for fit-testing of patients who are using respirators. **Unresolved issue**

VI.E.2. No recommendation for use of particulate respirators when leaving the Protective Environment in the absence of construction. **Unresolved issue**

VI.F. Use of Standard and Transmission-Based Precautions in a Protective Environment.

VI.F.1. Use Standard Precautions as recommended for all patient interactions. **Category IA**

VI.F.2. Implement Droplet and Contact Precautions as recommended for diseases listed in Appendix A in the original guideline document. Transmission-Based precautions for viral infections may need to be prolonged because of the patient's immunocompromised state and prolonged shedding of viruses (Weinstock, Gubareva, & Zuccotti, 2003; Elizaga et al., 2001; Hall, et al., 1986; Wood et al., 1988; Oishi et al., 1991). **Category IB**

VI.F.3. Barrier precautions, (e.g., masks, gowns, gloves) are not required for healthcare personnel in the absence of suspected or confirmed infection in the patient or if they are not indicated according to Standard Precautions ("Guidelines for preventing," 2000). **Category II**

VI.F.4. Implement Airborne Precautions for patients who require a Protective Environment room and who also have an airborne infectious disease (e.g., pulmonary or laryngeal tuberculosis, acute varicella-zoster). **Category IA**

VI.F.4.a. Ensure that the Protective Environment is designed to maintain positive pressure (AIA, 2006). **Category IB**

VI.F.4.b. Use an anteroom to further support the appropriate air-balance relative to the corridor and the Protective Environment; provide independent exhaust of contaminated air to the outside or place a HEPA filter in the exhaust duct if the return air must be recirculated (AIA, 2006; Murray et al., 1988). **Category IB**

VI.F.4.c. If an anteroom is not available, place the patient in an airborne infection isolation room (AIIR) and use portable, industrial-grade HEPA filters in the room to enhance filtration of spores (Rutala et al., 1995). **Category II**

Definitions:

Strength of the Recommendations

The recommendations are categorized on the basis of existing scientific data, theoretical rational, applicability, and when possible, economic impact, as follows:

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No recommendation; unresolved issue. Practices for which insufficient evidence or consensus regarding efficacy exists.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

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

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate use of protective environments to prevent the transmission of infectious agents in healthcare settings

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Much of the evidence cited for preventing transmission of infectious agents in healthcare settings is derived from studies that used "quasi-experimental designs", also referred to as nonrandomized, pre- post-intervention study designs. Although these types of studies can provide valuable information regarding the effectiveness of various interventions, several factors decrease the certainty of attributing improved outcome to a specific intervention. These include difficulties in controlling for important confounding variables; the use of multiple interventions during an outbreak; and results that are explained by the statistical principle of regression to the mean, (e.g., improvement over time without any intervention). Observational studies remain relevant and have been used to evaluate infection control interventions.

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

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

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

DATE RELEASED

1996 Jan (revised 2007 Jun)

GUIDELINE DEVELOPER(S)

Centers for Disease Control and Prevention - Federal Government Agency [U.S.]

SOURCE(S) OF FUNDING

United States Government

GUIDELINE COMMITTEE

Healthcare Infection Control Practices Advisory Committee (HICPAC)

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from Centers for Disease Control and Prevention (CDC) Web site.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on April 25, 1999. The information was verified by the guideline developer on November 15, 1999. This NGC summary was updated by ECRI Institute on September 5, 2007.

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Date Modified: 11/3/2008


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