	THE JOHNS HOPKINS HOSPITAL	Policy Number	IFC037
	INTERDISCIPLINARY CLINICAL PRACTICE MANUAL	Effective Date	7/31/04
	<i>Subject</i>	Page	1 of 4
	<b>Prevention and Control of Legionellosis</b>	Supersedes	8/01

**KEY WORDS:** Legionella, Legionellosis, Legionnaires Disease, Pontiac fever, pneumonia, water restrictions, water testing

**POLICY**

*Legionella sp.* is commonly found in various natural and man-made aquatic environments. Cooling towers, evaporative condensers, and hot potable-water-distribution systems within the hospital can provide a suitable environment for legionella to multiply. Patient populations who are immunosuppressed or who have chronic underlying illnesses are most at risk for acquiring legionellosis (Legionnaires disease; Pontiac fever).

**PATIENT CARE OBJECTIVES**

- To minimize the risk of nosocomial legionellosis, prevention and control measures will be instituted at the Johns Hopkins Hospital.

**RESPONSIBILITIES**

**All JHMI/JHH/JHU Staff**


A Legionella Task Force will meet on an ad hoc basis when convened by the Hospital Epidemiologist. The Task Force will include representatives of Hospital Epidemiology and Infection Control (HEIC), Facilities and Engineering, Risk Management, Nursing, Infectious Diseases, Health Safety, & Environment, Hospital Administration, Microbiology Lab, and Public Affairs.

1. HEIC: Nosocomial Legionella – see surveillance (below).
2. Facilities: Water Testing – see primary prevention (below).
3. Facilities and HEIC may be contacted with questions related to this policy.
4. Microbiology Lab: Identify and notify HEIC and Facilities of culture results.

**I. INFECTION CONTROL MANAGEMENT**

**A. SURVEILLANCE**

1. HEIC monitors the occurrence of nosocomial Legionella by daily review of microbiological laboratory data. Any positive culture/Direct Fluorescent Antibody (DFA) and/or urinary antigen for *Legionella sp.* is immediately reported to HEIC and is assessed for nosocomial acquisition. Pulse field gel electrophoresis (PFGE) maybe used to verify the nosocomial status of legionella cultures. All BAL specimens obtained for the diagnosis of pneumonia in the adult and pediatric population should be sent for Legionella DFA/culture.
  - Definition: The incubation period for Legionnaires disease is usually 2-10 days.
  - Definite nosocomial: A case will be considered nosocomial if *Legionella sp.* is identified by culture, DFA or urinary antigen in a patient that has been hospitalized continuously for 10 days before the onset of illness.
  - Possible nosocomial: A possible case is laboratory-confirmed infection that occurs 2-9 days after a JHH admission in which the onset of symptoms is 2-9 days.

	THE JOHNS HOPKINS HOSPITAL	<i>Policy Number</i>	IFC037
	INTERDISCIPLINARY CLINICAL PRACTICE MANUAL	<i>Effective Date</i>	7/31/04
	<i>Subject</i>	<i>Page</i>	2 of 4
	<b>Prevention and Control of Legionellosis</b>	<i>Supersedes</i>	8/01

## B. PRIMARY PREVENTION

### 1. Central Power Plant Cooling Towers


- a. The cooling towers located on top of the Central Power Plant (CPP) direct tower drift away from the hospital's air systems. Drift eliminators are utilized to minimize aerosol drift.
- b. An outside contractor together with Facilities evaluates and treats CPP water.
  - pH levels are monitored daily.
  - An RLU (light reflecting unit) test for bacteria is performed weekly. Biocide levels are monitored weekly by the contractor and a minimum of three times weekly by Facilities staff.
  - Legionella tests are sent out to an independent lab quarterly.
  - HEIC is notified of the results of all legionella testing.
  - If legionella is identified in the water, the towers are decontaminated in accordance with manufacturer's recommendation and standard industry practice.

### 2. JHOPC Cooling Towers

- a. A small enclosed tower above the JHOPC building serves radiology equipment.
- b. An outside contractor monitors the water treatment for the JHOPC cooling tower.
  - pH levels are monitored quarterly.
  - A biocide is fed into this system by an automatic feed system.
  - Biocide levels are monitored quarterly.
  - Legionella tests are conducted by an independent laboratory quarterly. The results are returned to Facilities for review.
  - HEIC is notified of the results of all legionella testing.
  - If Legionella is identified in the water, the towers are decontaminated in accordance to manufacturer's recommendation and standard industry practice.

### 3. Water-Distribution System

- a. Storage type hot water tanks were replaced with tankless instantaneous water heaters.
- b. Sink faucet aerators located in patient care areas shall be removed, decontaminated, and reinstalled annually.
- c. During daily cleaning of patient rooms, the cleaning personnel shall let the water in patient rooms (hot and cold water of faucets and showerheads) run a minimum of 5 minutes/day to facilitate chlorine dioxide flushing through pipes.
- d. Biocide tablets are installed, as needed, in evaporator drains pans serving air handling units and air conditioning units.
- e. Water temperature will be maintained at 110°F. at the sink outlet.
- f. Permanent water disinfection systems shall be installed in all in-patient care buildings utilizing Chlorine Dioxide as the disinfecting agent.
- g. Chlorine Dioxide will be used as a method of treating the water supply should Legionella be detected.

	THE JOHNS HOPKINS HOSPITAL	<i>Policy Number</i>	IFC037
	INTERDISCIPLINARY CLINICAL PRACTICE MANUAL	<i>Effective Date</i>	7/31/04
	<i>Subject</i>	<i>Page</i>	3 of 4
	<b>Prevention and Control of Legionellosis</b>	<i>Supersedes</i>	8/01

4. Other


- a. HEIC is responsible for reporting case(s) to the local health department. For nosocomial cases, in addition to the health department, appropriate individuals in Administration, including the President, Chief Operations Officer, Vice President of Nursing, and Vice President of Medical Affairs should also be notified.
- b. The JHH microbiology lab has Legionella testing capabilities including urinary antigen testing, DFA, and culture. Pulsed-field gel electrophoresis (PFGE) is available to compare all cultivatable isolates from clinical and environmental sources.

5. Patient Care

- a. Sterile water is used for rinsing nebulizers and other semi-critical respiratory care equipment.
- b. Physicians and providers are advised to routinely send expectorated sputum, brocheoalveolar specimens, and urinary antigen for Legionella in high-risk patients with pneumonia. All bronchoscopy specimens, expectorated sputum, tracheal aspirates, and pleural fluid from patients suspected of having nosocomial pneumonia should be submitted for Legionella culture.
- c. Water cultures are done quarterly in buildings that house high-risk patients. Results will be reviewed with HEIC. HEIC will convene the Legionella Task Force and will meet as necessary to determine a plan of action in the event Legionella sp. is detected.

**C. SECONDARY PREVENTION**

1. When a single case of laboratory-confirmed nosocomial Legionnaire's disease is identified, **or** at least 2 possible cases exposed to the same water system in 6 months, the following procedures will go into effect in the specific buildings.
  - a. Epidemiological and Environmental Investigation
    - Review of recent nosocomial pneumonia cases.
    - Consult with Occupational Health Service on possible pneumonia cases among employees.
    - Culture water on the unit(s) where the affected patients resided including aerators and showerheads. Use PFGE to compare isolates from the patient to environmental isolates in the event of positive cultures.
    - If culture results are positive for *Legionella sp.*:
      - BMT and solid organ transplant patients will bathe with water that is not contaminated with *Legionella sp.*
      - Patients will not be allowed to shower in water contaminated with *Legionella sp.*
      - Bottled water will be used for drinking and medications in affected building(s).
      - Notify Local and State Health Departments of positive cultures.
      - Follow recommendations mandated by the Health Department.
      - Restrictions will continue to affect building(s) until recommendations made by Health Department have been met. The Health Department will lift the restrictions based on those results.

	<b>THE JOHNS HOPKINS HOSPITAL</b>	<i>Policy Number</i>	IFC037
	<b>INTERDISCIPLINARY CLINICAL PRACTICE MANUAL</b>	<i>Effective Date</i>	7/31/04
	<i>Subject</i>	<i>Page</i>	4 of 4
	<b>Prevention and Control of Legionellosis</b>	<i>Supersedes</i>	8/01

b. Water System

If the isolate from the patient and the environment are identical as identified by DNA analysis or a nosocomial case is documented, the water system will be disinfected. Selection of the method will be a decision of Legionella Task Force.

**SPONSOR**

- Medical Care Evaluation Committee

**DEVELOPER**

- Hospital Epidemiology and Infection Control

**REFERENCES**

Brundrett, G.W. (1992). *Legionella and building services*. 1<sup>st</sup> ed. Oxford, GB: Butterworth-Heinemann Ltd.

Centers for Disease Control. (2002). *Guideline for the Prevention of Nosocomial Pneumonia*.

Center for Disease Control. (2000). *Guidelines for preventing opportunistic infections among hematopoietic stem cell transplant recipients*.

State of Maryland. (2000). *Report of the Maryland scientific working group to study Legionella in water systems in healthcare institutions*, June 14.

**COMMUNICATION & EDUCATION**

This policy will be communicated to the appropriate JHH personnel via the following channels:

1. HEIC Committee will communicate this policy to departments.
2. Department Managers will ensure compliance.
3. This policy will be placed in the Interdisciplinary Clinical Practice Manual on the JHH Intranet site <http://www.insidehopkinsmedicine.org/icpm>. Paper distributions will be made to the Functional Unit Nursing offices in the event of web access difficulty.
4. Placement of policy online at [www.hopkins-HEIC.org](http://www.hopkins-HEIC.org).

<b>REVIEW CYCLE</b>	• Three (3) years	<b>MEDICAL BOARD</b>	Approval Date: 6/29/04 Effective Date: 7/31/04
VICE PRESIDENT FOR MEDICAL AFFAIRS			
_____			
Date:			