

Water...what is the risk?

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Objectives

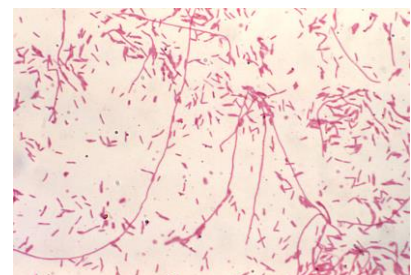
- Describe impact of Legionnaires Disease on the healthcare system
- State why a Water Infection Control Risk Assessment is needed
- Conduct a Water Infection Control Risk Assessment



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What is the impact?

- Over 40000 annual hospitalizations for primary waterborne disease
 - giardiasis, cryptosporidiosis, Legionnaires' disease, otitis externa, and non-tuberculous mycobacterial infection
- Cost 970 million annually
- At least 430 million in costs for Medicare and Medicaid patients
- Legionnaires disease and NTM had highest cost per episode



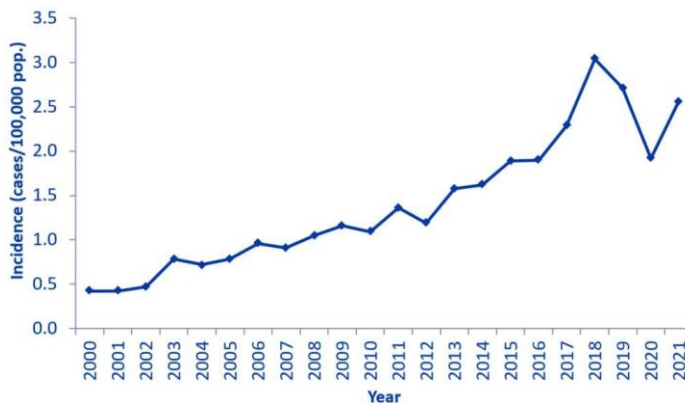
<https://phil.cdc.gov/Details.aspx?pid=6642>



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COLLIER SA, STOCKMAN LJ, HICKS LA, GARRISON LE, ZHOU FJ, BEACH MJ. Direct healthcare costs of selected diseases primarily or partially transmitted by water. *Epidemiology and Infection*. 2012;140(11):2003-2013. doi:10.1017/S0950268811002858

Legionnaires' disease in the United States, 2000-2021



<https://www.cdc.gov/legionella/php/surveillance/index.html>

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Multiple Sources of the Outbreak of Legionnaires' Disease in Genesee County, Michigan, in 2014 and 2015

Anyia F. Smith, Anke Huss, Samuel Dorevitch, Leo Heijnen, Vera H. Amtzen, Megan Davies, Mima Robert-Du Ry van Beest Holle, Yuki Fujita, Antonie M. Verschoor, Bernard Raterman, Frank Oosterholt, Dick Heederik, and Gerjan Medema

- April 2014
 - Water source switched from Detroit Water and Sewerage Department to Flint River water
 - Treated and distributed without corrosion inhibitor
- Residents noted changes in the water shortly after the switch including
 - Color
 - Odor
 - Taste
 - Skin rashes
- Increased lead levels noted in children living in Flint
- Outbreak of Legionella identified
- October 2015, state of emergency declared and change back to Detroit Water and Sewerage Department

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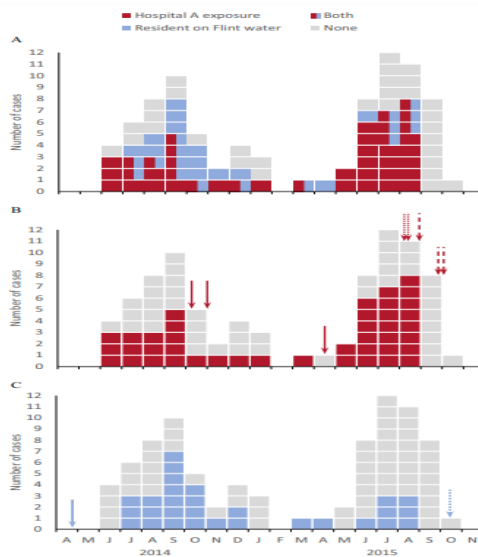


Figure 3. Epidemic curves of Legionnaires' disease cases in Genesee County in 2014 and 2015 by month. (A) Cases with exposure to hospital A, residential exposure to Flint water, both exposure to hospital A and residential exposure to Flint water and no exposure to hospital A or residential exposure to Flint water. (B) Cases with and without exposure to hospital A. Arrows represent the date of Legionella control interventions in the plumbing system of hospital A: hyperchlorination events (solid), superheating and hyperchlorination (dotted), and the start of monochloramination (dashed). (C) Cases with and without residence on Flint water. Arrows indicate the date the water source was switched from Detroit water to Flint River (solid) and back (dotted).

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3 dead in Legionnaire's disease outbreak at New York assisted living facility

Since the discovery of Legionella bacteria at the Albany facility, 20 people have been hospitalized and three of those who tested positive have died.

<https://www.nbcnews.com/news/us-news/3-dead-legionnaires-disease-outbreak-new-york-assisted-living-facility-rcna169783>

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Why do a WICRA

- To identify areas of opportunity
- To develop your management plan
- To determine what needs to be monitored
- To when and how monitoring is completed



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What is a “Water Infection Control Risk Assessment (WICRA)”

- A tool used to identify risk within your water system
- Used to evaluate:
 - Sources of water
 - Modes of transmission
 - Susceptible patients
 - Exposure opportunities
 - Preparedness



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Insert annotations as needed

When do you do the WICRA?

- When you initially develop your water management program
- Updated according to your water management plan
- May update for
 - Scheduled reviews
 - New equipment brought into the facility
 - Change in facility or building structure



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Who is involved in conducting the WICRA?

- Including but not limited to
 - Infection prevention
 - Facility engineers
 - Environmental services
 - Safety officer



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What do you need to consider?

WATER SOURCES
Patients are potentially exposed to water via the healthcare environment, equipment, or procedures. Water sources include, but are not limited to:

- Sinks
- Water source
- Sinks
- Drains
- Showers
- Toilets
- Hoppers
- Humidification devices
- Mechanical ventilators
- Endoscopes
- Heater cooler devices
- Ice machines
- Indoor decorative fountains
- Lactation equipment
- Enteral feeding
- Bathing procedures
- Oral care

MODES OF TRANSMISSION
When assessing risk of healthcare-associated infections caused by waterborne pathogens, consider the diverse modes of transmission, including:

- Direct contact (e.g., bathing, showering)
- Ingestion of water (e.g., consumption of contaminated ice)
- Indirect contact (e.g., from an improperly reprocessed medical device)
- Inhalation of aerosols dispersed from water sources (e.g., faucets with aerators)
- Aspiration of contaminated water (e.g., use of tap water to flush enteral feedings)

PATIENT SUSCEPTIBILITY
Patient populations with compromised immune status, comorbidities, and exposure to certain procedures are more vulnerable to infections caused by waterborne pathogens. Units/wards/wings can be classified according to those patients treated in these areas:

- Highest (e.g., BMT, solid-organ transplant, hematology, medical oncology, burn unit, NICU)
- High (e.g., non-transplant ICUs, ORs)
- Moderate (e.g., general inpatient units)
- Low (e.g., waiting rooms, administrative office areas)

PATIENT EXPOSURE
In order to characterize patient exposure to water sources, consider a categorization scheme that encompasses factors such as the frequency (how often), magnitude (how much), and duration (how long) of exposure:

- High (e.g., high frequency, magnitude, and duration)
- Moderate (e.g., combination of high and low frequency, magnitude, and duration)
- Low (e.g., low frequency, magnitude, and duration)
- None (e.g., patients are not exposed to the water source)

CURRENT PREPAREDNESS
Consider how your WMP addresses different water sources, as determined by factors such as policies and procedures already in place, relevant staff practices, and implemented mitigation strategies.

- Poor (e.g., limited policies and procedures, staff practices, and mitigation strategies)
- Fair (e.g., some policies and procedures, staff practices, and mitigation strategies)
- Good (e.g., robust policies and procedures, staff practices, and mitigation strategies)

WATER INFECTION CONTROL RISK ASSESSMENT (WICRA) FOR HEALTHCARE SETTINGS



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How do you perform the assessment?

Water Infection Control Risk Assessment (WICRA) for Healthcare Settings

Facility Name: Hospital A Assessment Location: Burn ICU

Performed By (names): Jane Smith and John Doe Assessment Date: 10/01/2020

WMP Team Role(s) (check all that apply):

Hospital Epidemiologist/Infection Preventionist Facilities Manager/Engineer Environmental Services Compliance/Safety Officer

Risk/Quality Management Staff Infectious Disease Clinician Consultant

Equipment/Chemical Acquisition/Supplier Other (please specify):

Location	Water Source	Modes of Transmission	Patient Susceptibility Highest = 4 High = 3 Moderate = 2 Low = 1	Patient Exposure High = 3 Moderate = 2 Low = 1 None = 0	Current Preparedness Poor = 3 Fair = 2 Good = 1	Total Risk Score = Patient Susceptibility x Patient Exposure x Preparedness	Comments
BICU Inpatient Rooms	Sink counter storage of patient care supplies	Indirect contact; splashing onto supplies	4	3	3	36	Install splash guards; QI for sink hygiene; and flushing
BICU Inpatient Rooms	Toilets without lid	Direct contact	4	3	2	24	Place lid on toilet if in patient room
BICU Soiled Utility	Hopper, no lid, behind closed door	Indirect contact	4	2	1	8	Automatic door closure; appropriate soiled equipment storage
BICU Medication Preparation Room	Sink with aerator, no splash guard	Aerosolization, and potential for splashing	4	2	3	24	Install splash guards; evaluate removing aerator
BICU Hydrotherapy Room	Debridement showers	Direct contact	4	3	1	12	Monthly EVS audits room indicating 85% adherence to policies
BICU Nurses Station	Sink closest to door	Indirect contact; HCW hands; devices	4	2	3	24	Install splash guards or move IV bags storage

WATER INFECTION CONTROL RISK ASSESSMENT (WICRA) FOR HEALTHCARE SETTINGS



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- Toilets
- Hoppers
- Handification devices
- Mechanical ventilators
- Endoscopes
- Heater cooler devices
- Ice machines
- Indoor decorative fountains
- Lactation equipment
- Enteral feeding
- Bathing procedures
- Oral care

MODES OF TRANSMISSION
When assessing risk of healthcare-associated infections caused by waterborne pathogens, consider the diverse modes of transmission, including:

- Direct contact (e.g., bathing, showering)
- Ingestion of water (e.g., consumption of contaminated tap)
- Indirect contact (e.g., from an improperly reprocessed medical device)
- Inhalation of aerosols dispersed from water spaces (e.g., faucets with aerators)
- Aspiration of contaminated water (e.g., use of tap water to flush enteral feedings)

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- Highest (e.g., BMT, solid-organ transplant, hematologic medical oncology, burn unit, NICU)
- High (e.g., Non-transplant ICU, OFU)
- Moderate (e.g., general inpatient units)
- Low (e.g., waiting rooms, administrative office areas)
- None (e.g., patients are not exposed to the water source)

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In order to characterize patient exposure to water sources, consider a categorization scheme that encompasses factors such as the frequency (how often), magnitude (how much), and duration (how long) of exposure:

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- Facilities Manager/Engineer
- Infectious Disease Clinician
- Other (please specify):
- Environmental Services
- Consultant
- Compliance/Safety Officer

Location	Water Source	Modes of Transmission	Patient Susceptibility			Current Preparedness	Total Risk Score = Patient Susceptibility x Patient Exposure x Preparedness	Comments
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ICU Inpatient Rooms	Sink counter storage of patient care supplies	Indirect contact: splashing onto supplies	4	3	3	36	Install splash guards, QI for sink hygiene, and flushing	
ICU Inpatient Rooms	Toilets without lid	Direct contact	4	3	2	24	Place lid on toilet if in patient room	
ICU Solid Utility	Hopper, no lid, behind closed door	Indirect contact	4	2	1	8	Automatic door closure, appropriate solid equipment storage	
ICU Medication Preparation Room	Sink with aerator, no splash guard	Aerosolization, and potential for splashing	4	2	3	24	Install splash guards, evaluate removing aerator	
ICU Hydrotherapy Room	Debridement showers	Direct contact	4	3	1	12	Monthly EVS audits room indicating 95% adherence to policies	
ICU Nurses Station	Sink closest to door	Indirect contact: HCW hands, devices	4	2	3	24	Install splash guards or move IV bag storage	

WATER INFECTION CONTROL RISK ASSESSMENT (WICRA) FOR HEALTHCARE SETTINGS



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This Intensive Care Unit (ICU) is equipped to care for adult patients requiring complex medical support, including those on ventilators, undergoing dialysis, or recovering from solid organ transplants. This layout prioritizes effective patient care, safety, and accessibility, addressing the unique needs of critically ill patients.



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Patients are potentially exposed to water via the healthcare environment, equipment, or procedures. Water sources include, but are not limited to:

- Sinks
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- Toilets
- Hoppers
- Endoscopes
- Heater cooler devices
- Lactation equipment
- Sinks
- Handification devices
- Ice machines
- Bathing procedures
- Drains
- Showers
- Mechanical ventilators
- Indoor decorative fountains
- Oral care

MODES OF TRANSMISSION
When assessing risk of healthcare-associated infections caused by waterborne pathogens, consider the diverse modes of transmission, including:

- Direct contact (e.g., bathing, showering)
- Ingestion of water (e.g., consumption of contaminated tap)
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WATER INFECTION CONTROL RISK ASSESSMENT (WICRA) FOR HEALTHCARE SETTINGS



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This medical-surgical unit is dedicated to caring for pediatric patients, ranging from neonates to 18 years of age. This design focuses on providing appropriate care and amenities for young patients in the unit.



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This long-term care facility dedicated to provide care to residents with multiple health issues



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