COMMONWEALTH OF MASSACHUSETTS

SUFFOLK, SS.

SUPERIOR COURT
DEPARTMENT OF
THE TRIAL COURT

24-0260 B

ASHLEY W. MUNROE, PERSONAL REPRESENTATIVE OF THE ESTATE OF GUY W. MUNROE,

Plaintiff,

v.

MASS GENERAL BRIGHAM, INC., LUIS ALBERTO SOTO, GEORGE PLAYER, COLIN MACLACHLAN, DAVID MCCREADY, AND XYZ CORPORATION,

Defendants.

COMPLAINT

The Parties

1. The plaintiff, Ashley W. Munroe, resides at 275 Medford Street, City of Charlestown, County of Suffolk, Commonwealth of Massachusetts, is the daughter of the late Guy W. Munroe, and is the duly appointed Personal Representative of the Estate of Guy W. Munroe.

2. The defendant, Mass General Brigham, Inc., is a Massachusetts corporation, having a usual place of business at 800 Boylston Street, Suite 1150, City of Boston, County of Suffolk, Commonwealth of Massachusetts, is the successor corporation to Partners Healthcare Systems, Inc. (the current and predecessor corporations will be referred to herein as "Mass General Brigham, Inc."), and at all times owned and operated Brigham & Women's Hospital, 70-75 Francis Street, City of

Boston, County of Suffolk, Commonwealth of Massachusetts.

3. The defendant, Luis Alberto Soto, resides at 7 Brookfield Street, City of Boston (Roslindale), County of Suffolk, Commonwealth of Massachusetts, at all material times was an agent, servant, and/or employee of the defendant, Mass General Brigham, Inc., and/or its related corporate entities, and served as the Director of Environmental Services at Brigham & Women's Hospital at all material times.

4. The defendant, George Player, resides at 103 Candia Street, Town of Weymouth, County of Norfolk, Commonwealth of Massachusetts, at all material times was an agent, servant, and/or employee of the defendant, Mass General Brigham, Inc., and/or its related corporate entities, and served as the Director of Engineering at Brigham & Women's Hospital until his retirement in 2017.

5. The defendant, Colin MacLachlan, resides at 8 Edgemere Road, Town of Lynnfield, County of Essex, Commonwealth of Massachusetts, at all material times was an agent, servant, and/or employee of the defendant, Mass General Brigham, Inc., and/or its related corporate entities, and served as the Director of Engineering at Brigham & Women's Hospital beginning in 2017.

6. The defendant, David McCready, resides at 8 Dean Circle, Town of Andover, County of Middlesex, Commonwealth of Massachusetts, at all material times was an agent, servant, and/or employee of the defendant, Mass General Brigham, Inc., and/or its related corporate entities, and served as the head of Facilities and Operations at Brigham & Women's Hospital at all material times.

7. The defendant, XYZ Corporation, at all material times was a vendor of and/or contracted with the defendant, Mass General Brigham, Inc., and/or its related

corporate entities. The full identity and address of XYZ Corporation is presently unknown to the plaintiff.

The Facts

8. On or about, March 24, 2017, the plaintiff's decedent, Guy W. Munroe underwent heart transplant surgery at Brigham & Women's Hospital in Boston, Massachusetts and thereafter remained a patient in the Carl J. and Ruth Shapiro Cardiovascular Center at Brigham & Women's Hospital ("Shapiro Center") during his recovery and until the time of his death.

9. While he was a patient at Brigham & Women's Hospital, the defendants owed the plaintiff's decedent, Guy W. Munroe, and all other patients a duty of care, including a duty to provide them with clean, non-contaminated, and properly chlorinated water suitable for consumption in the Shapiro Center, i.e., safe water to drink and use. This duty included, but was not limited to, an ongoing duty to maintain a commercial water purification system and related component parts in a manner that complied with industry standards, a duty to provide properly chlorinated water in order to prevent and/or reduce the risk of bacteria, a duty to properly install a commercial water filter within the system, and an ongoing duty to repair, inspect, maintain, test, monitor, and clean the water purification system and its component parts in order to ensure that the water provided to patients met industry standards, was sufficiently chlorinated in order to prevent and/or reduce the risk of bacteria, and that bacteria were not allowed to proliferate and/or contaminate the patient water supply.

10. In the course of their employment and their respective positions in the Environmental Services, Engineering, and Facilities and Operations Departments as

agents, servants and/or employees of the defendant, Mass General Brigham, Inc., the defendants, Luis Alberto Soho, George Player, Colin MacLachlan, and David McCready, were responsible for the oversight, installation, maintenance, inspection, cleaning, testing, monitoring and repair of the commercial water purification system and component parts that supplied the water and ice machines in the Shapiro Center, and had a duty to monitor the water supply to ensure that the water was safe to drink and use.

11. The defendant, Mass General Brigham, Inc., contracted with and/or otherwise hired the defendant, XYZ Corporation, to oversee, install, maintain, inspect, clean, test, monitor and repair the commercial water purification system and component parts that supplied the water and ice machines in the Shapiro Center at Brigham & Women's Hospital. XYZ Corporation and its agents, servants and/or employees were responsible for the oversight, installation, maintenance, inspection, cleaning, testing, monitoring and repair of the commercial water purification system and component parts that supplied the water and ice machines in the Shapiro Center, and had a duty to monitor the water supply to ensure that the water was safe to drink and use.

12. In violation of the duty of care and skill owed to the plaintiff's decedent, Guy W. Munroe, the defendants and their servants, agents and/or employees for which they were legally responsible so carelessly and negligently installed, maintained, inspected, cleaned, tested, monitored and repaired the commercial water purification system and its component parts that supplied the water and ice machines in the Shapiro Center such that *Mycobacterium abscessus*, a drug-resistant common water contaminant mycobacteria known to be caused by improperly or insufficiently

chlorinated drinking water, was allowed to develop and proliferate in the patient water supply resulting in patients, including Guy W. Munroe, being exposed to and infected by *Mycobacterium abscessus* through contaminated water and ice. This negligence included, but was not limited to, the ongoing and repeated placement of a commercial water filter at an incorrect location within the water purification system at the Shapiro Center at all material times which improperly removed and/or reduced the amount of chlorine in the patient water supply and allowed bacteria to proliferate and contaminate the patient water supply, and, following the placement of the water filter, an ongoing and repeated failure to properly maintain, inspect, clean, test, monitor and repair the water purification system and its component parts, and the water supply itself, which led to a failure to discover, detect, and eliminate the bacteria and prevent patients from being infected. The subject commercial water filter was a mass-produced, generic, and/or standardized piece of equipment that can be and is marketed, sold and/or distributed for use in a number of different applications and for incorporation into various types of buildings and was in no way unique to and/or in any way designed for the subject water purification system in the Shapiro Center.

13. During his recovery at Brigham & Women's Hospital, the plaintiff's decedent, Guy W. Munroe, repeatedly consumed and was otherwise exposed to water from the water purification system in the Shapiro Center over the course of many months while he was a patient there. This consumption included, but was not limited to, the water and ice from machines utilizing the subject water system.

14. During his recovery at Brigham & Women's Hospital following the subject March 2017 surgery, the plaintiff's decedent, Guy W. Munroe, became ill and was

ultimately diagnosed with *Mycobacterium abscessus*. Guy W. Munroe died on November 9, 2017 as a result of the *Mycobacterium abscessus* infection he developed from his exposure to the contaminated water supply in the Shapiro Center.

15. As a result of the injuries sustained as aforesaid, Guy W. Munroe, was caused to suffer great pain of body and anguish of mind, loss of enjoyment of life, his earning capacity was impaired for a long period of time, and he expended large sums of money for medical care and attendance.

16. The injuries to Guy W. Munroe and his death as aforesaid, were the result of the carelessness, negligence, and/or gross negligence of the defendants, and/or others for whom the defendants were legally responsible.

17. The carelessness, negligence, and/or gross negligence of the defendants, and/or others for whom the defendants were legally responsible, as alleged herein is not an action for malpractice, error, or mistake against a provider of health care as defined by M.G.L. ch. 231, §60B.

18. Guy W. Munroe left surviving him next of kin.

19. In or about October 2018, the defendant, Mass General Brigham, Inc., and its agents, servants and/or employees began an investigation into the origins of Guy W. Munroe's *Mycobacterium abscessus* infection and his resulting death, as well as the infections and deaths of other patients at Brigham & Women's Hospital between March 2017 and October 2018.

20. By the end of October 2018 at the latest, the defendant, Mass General Brigham, Inc., and its agents, servants and/or employees, including, but not limited to its co-defendant agents, servants and/or employees, knew or should have known that Guy

W. Munroe's *Mycobacterium abscessus* infection and his resulting death were caused by his exposure to contaminated water from the ice and water machines and their related component parts within the Shapiro Center, and by the carelessness, negligence and/or gross negligence of the defendants as aforesaid.

21. By the end of October 2018 at the latest, the defendant, Mass General Brigham, Inc., and its agents, servants and/or employees, including, but not limited to its co-defendant agents, servants and/or employees, knew or should have known that Guy W. Munroe's *Mycobacterium abscessus* infection and his resulting death were caused by the commercial water filter in the water purification system at the Shapiro Center and the ongoing failure of the defendants to properly inspect, maintain, clean, test, monitor and repair the ice and water machines and their related component parts, and the water supply itself.

22. Despite this knowledge and by actual fraud and/or a breach of their fiduciary duty to disclose said information to the plaintiff and/or Guy W. Munroe's other next of kin, the defendant, Mass General Brigham, Inc., and its agents, servants and/or employees, including, but not limited to its co-defendant agents, servants and/or employees, made intentional omissions regarding and/or fraudulently concealed the information described in Paragraphs 19-21 from the plaintiff and Guy W. Munroe's other next of kin with the knowledge and belief that a cause of action for wrongful death on behalf of the Estate of Guy W. Munroe existed due to the defendants' carelessness, negligence, and/or gross negligence as described herein with respect to the water purification system and the water supply at the Shapiro Center. Such intentional omissions and/or the fraudulent concealment of this information was done with the

intent to conceal the defendants' carelessness, negligence and/or gross negligence in causing the death of Guy W. Munroe from the plaintiff.

23. It was not until March 6, 2023 that the defendant, Mass General Brigham, Inc., and its agents, servants and/or employees revealed to the plaintiff and/or Guy W. Munroe's other next of kin that Guy W. Munroe's *Mycobacterium abscessus* infection and his resulting death were caused by his exposure to the contaminated water from the water and ice machines and their component parts within the Shapiro Center. This was subsequently confirmed in detail in the form of a front-page article in the Boston Globe on March 7, 2023 (published online during the evening of March 6, 2023, Exhibit 1) and the March 7, 2023 publication of an article written by Mass General Brigham, Inc.'s agents, servants and/or employees titled "*Mycobacterium abscessus* Cluster in Cardiac Surgery Patients Potentially Attributable to a Commercial Water Purification System". The article was published in the Annals of Internal Medicine, a peer-reviewed medical journal, is attached as Exhibit 2, and is incorporated herein by reference.

24. Prior to March 6, 2023 and due to the knowing and fraudulent concealment and/or intentional omissions made by the defendant, Mass General Brigham, Inc., and its agents, servants and/or employees, including, but not limited to its co-defendant agents, servants and/or employees, regarding the cause of Guy W. Munroe's *Mycobacterium abscessus* infection, the plaintiff and/or Guy W. Munroe's other next of kin did not and could not have known that the plaintiff's decedent, Guy W. Munroe's *Mycobacterium abscessus* infection and his resulting death were caused by the carelessness, negligence, and/or gross negligence of the defendants, and/or others for whom the defendants were legally responsible.

25. The plaintiff reasonably relied on the intentional omissions and/or fraudulent concealment of the defendant, Mass General Brigham, Inc., and its agents, servants and/or employees, including, but not limited to its co-defendant agents, servants and/or employees, as described in Paragraph 22 such that the plaintiff was prevented from and/or otherwise had no reason to seek appointment as the Personal Representative of the Estate of Guy W. Munroe and/or file the present wrongful death action until after March 6, 2023.

Causes of Action

(Each Cause of Action Specifically Incorporates by Reference All of Those Paragraphs Previously Set Forth)

First Cause of Action

26. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Mass General Brigham, Inc., for negligence for the damages suffered by the plaintiff's decedent, Guy W. Munroe, prior to his death, including, but not limited to, conscious pain and suffering.

Second Cause of Action

27. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Mass General Brigham, Inc., for negligence and gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe, in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Third Cause of Action

28. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Mass General

Brigham, Inc., for punitive damages in causing the death of plaintiff's decedent, Guy W. Munroe, by gross negligence in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Fourth Cause of Action

29. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Mass General Brigham, Inc., for fraudulent concealment of the defendant's negligence and/or gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe.

Fifth Cause of Action

30. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Luis Alberto Soto, for negligence for the damages suffered by the plaintiff's decedent, Guy W. Munroe, prior to his death, including, but not limited to, conscious pain and suffering.

Sixth Cause of Action

31. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Luis Alberto Soto, for negligence and gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe, in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Seventh Cause of Action

32. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Luis Alberto Soto, for punitive damages in causing the death of plaintiff's decedent, Guy W. Munroe,

by gross negligence in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Eighth Cause of Action

33. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Luis Alberto Soto, for fraudulent concealment of the defendant's negligence and/or gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe.

Ninth Cause of Action

34. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, George Player, for negligence for the damages suffered by the plaintiff's decedent, Guy W. Munroe, prior to his death, including, but not limited to, conscious pain and suffering.

Tenth Cause of Action

35. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, George Player, for negligence and gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe, in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Eleventh Cause of Action

36. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, George Player, for punitive damages in causing the death of plaintiff's decedent, Guy W. Munroe, by gross negligence in accordance with the provisions of Massachusetts General Laws,

Chapter 229, as amended and applicable at the time material herein.

Twelfth Cause of Action

37. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, George Player, for fraudulent concealment of the defendant's negligence and/or gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe.

Thirteenth Cause of Action

38. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Colin MacLachlan, for negligence for the damages suffered by the plaintiff's decedent, Guy W. Munroe, prior to his death, including, but not limited to, conscious pain and suffering.

Fourteenth Cause of Action

39. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Colin MacLachlan, for negligence and gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe, in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Fifteenth Cause of Action

40. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Colin MacLachlan, for punitive damages in causing the death of plaintiff's decedent, Guy W. Munroe, by gross negligence in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Sixteenth Cause of Action

41. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, Colin MacLachlan, for fraudulent concealment of the defendant's negligence and/or gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe.

Seventeenth Cause of Action

42. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, David McCready, for negligence for the damages suffered by the plaintiff's decedent, Guy W. Munroe, prior to his death, including, but not limited to, conscious pain and suffering.

Eighteenth Cause of Action

43. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, David McCready, for negligence and gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe, in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Nineteenth Cause of Action

44. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, David McCready, for punitive damages in causing the death of plaintiff's decedent, Guy W. Munroe, by gross negligence in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Twentieth Cause of Action

45. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, David McCready, for fraudulent concealment of the defendant's negligence and/or gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe.

Twenty-First Cause of Action

46. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, XYZ Corporation, for negligence for the damages suffered by the plaintiff's decedent, Guy W. Munroe, prior to his death, including, but not limited to, conscious pain and suffering.

Twenty-Second Cause of Action

47. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, XYZ Corporation, for negligence and gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe, in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Twenty-Third Cause of Action

48. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, XYZ Corporation, for punitive damages in causing the death of plaintiff's decedent, Guy W. Munroe, by gross negligence in accordance with the provisions of Massachusetts General Laws, Chapter 229, as amended and applicable at the time material herein.

Twenty-Fourth Cause of Action

49. This is an action by the plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, against the defendant, XYZ Corporation, for fraudulent concealment of the defendant's negligence and/or gross negligence in causing the death of plaintiff's decedent, Guy W. Munroe.

Demand for Relief

50. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, Mass General Brigham, Inc., in the amount of damages, together with interest and costs, as to the First, Second and Fourth Causes of Action.

51. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, Mass General Brigham, Inc., together with interest and costs, in an amount of not less than $5,000 as to the Third Cause of Action.

52. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, Luis Alberto Soto, in the amount of damages, together with interest and costs, as to the Fifth, Sixth and Eighth Causes of Action.

53. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, Luis Alberto Soto, together with interest and costs, in an amount of not less than $5,000 as to the Seventh Cause of Action.

54. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate

of Guy W. Munroe, demands judgment against the defendant, George Player, in the amount of damages, together with interest and costs, as to the Ninth, Tenth and Twelfth Causes of Action.

55. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, George Player, together with interest and costs, in an amount of not less than $5,000 as to the Eleventh Cause of Action.

56. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, Colin MacLachlan, in the amount of damages, together with interest and costs, as to the Thirteenth, Fourteenth and Sixteenth Causes of Action.

57. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, Colin MacLachlan, together with interest and costs, in an amount of not less than $5,000 as to the Fifteenth Cause of Action.

58. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, David McCready, in the amount of damages, together with interest and costs, as to the Seventeenth, Eighteenth and Twentieth Causes of Action.

59. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, David McCready, together with interest and costs, in an amount of not less than $5,000 as to the Nineteenth Cause of Action.

60. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, XYZ Corporation, in the amount of damages, together with interest and costs, as to the Twenty-First, Twenty-Second and Twenty-Fourth Causes of Action.

61. The plaintiff, Ashley W. Munroe as Personal Representative of the Estate of Guy W. Munroe, demands judgment against the defendant, XYZ Corporation, together with interest and costs, in an amount of not less than $5,000 as to the Twenty-Third Cause of Action.

Jury Claim

62. The plaintiff claims a trial by jury.

PLAINTIFF,

By her Attorneys,

SUGARMAN AND SUGARMAN, P.C.

DATE: January 25, 2024

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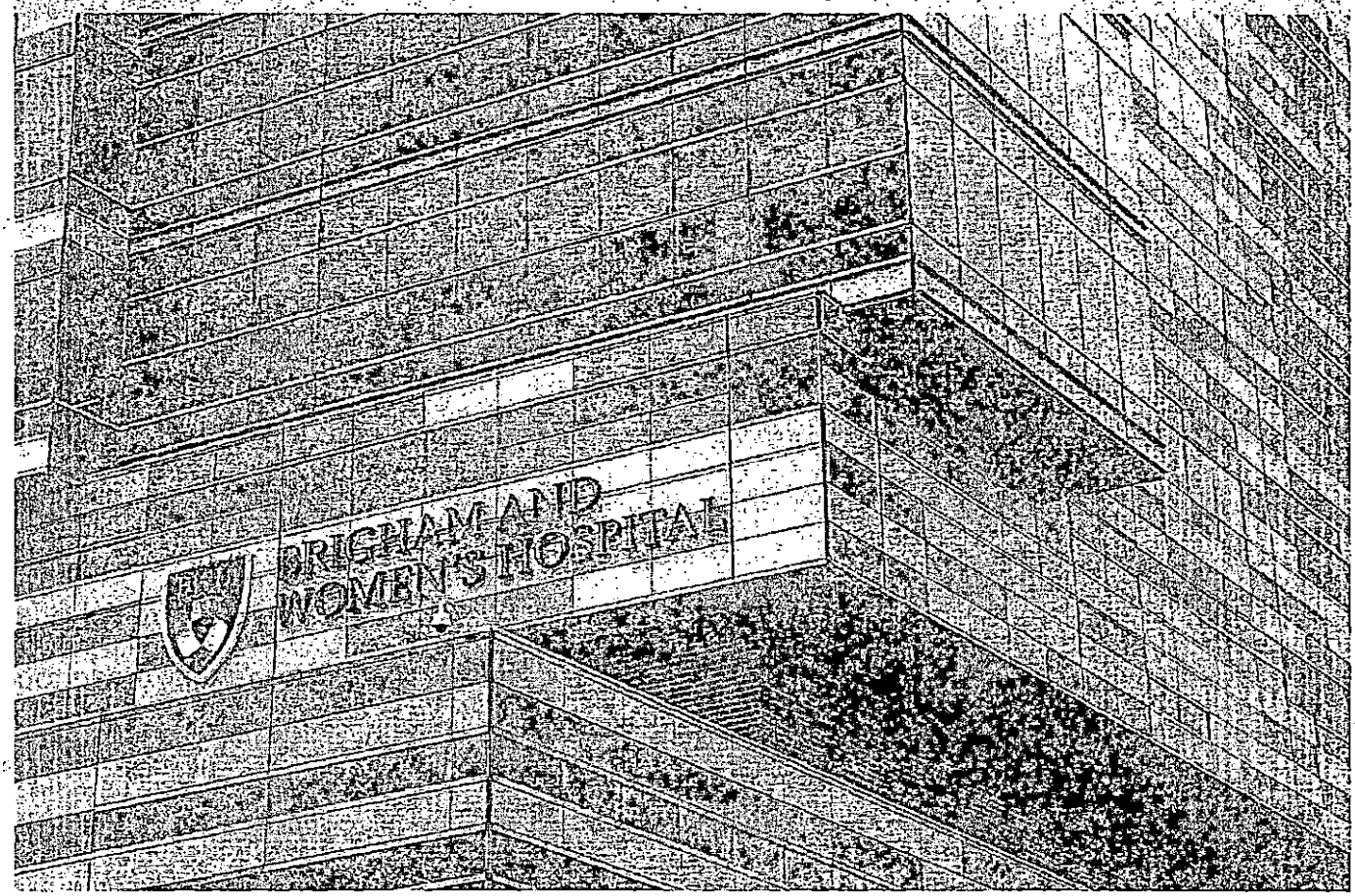
EXHIBIT 1

A bacterial infection killed three patients at Brigham and Women's. Here's how it got in.

By Jessica Bartlett Globe Staff, Updated March 6, 2023, 5:00 p.m.



Officials at Brigham and Women's Hospital did a deep dive into a bacteria outbreak among cardiac patients. DAVID L. RYAN/GLOBE STAFF

An infectious disease clinician working closely with the cardiac surgery department had an inkling something was off. It was 2018, and she mentioned to colleagues at Brigham and Women's Hospital the unusual occurrence of a suspicious bacteria, which had popped up several times in the last year and a half. The rare bacteria, Mycobacterium

abscessus, can sometimes cause hospital-acquired infections, often from contaminated water. But the number of times hospitalized patients had tested positive for it struck her as odd.

What followed was a deep dive into infection control that ultimately identified four patients who had been infected with the same strain of M abscessus. Despite efforts to treat the infections, three of the four patients died.

Ultimately the hospital discovered the culprit: a water purification system feeding an ice and water machine on the cardiac unit.

The who-done-it analysis of where the bacteria originated, and the lessons that followed for the hospital about infection control, has been highlighted in a study published by Brigham clinicians on Monday in the Annals of Internal Medicine. The piece lays out the detective work involved in finding a potentially deadly pathogen and shares critical insight into protocols that researchers hope other hospitals will take to heart.

"Every health care facility in the world will have a potential [encounter] with hospital acquired infections," said Dr. Michael Klompas, an infectious disease physician and hospital epidemiologist at Brigham and Women's who led the investigation. "It's not a

unique problem to us. If we pretend it doesn't exist, we will never be as successful as we can be if we confront these head on."

Infections disease expert Dr. Todd Ellerin applauded what he described as an intricate, epidemiologic investigation, saying it was unusual for a system to find the source of such outbreaks.

"There is a lot of sleuthing," said Ellerin, interim chief of medicine and head of infectious diseases at South Shore Health. Ellerin was not part of the investigation, though South Shore is clinically affiliated with the Brigham in several specialties. "The Brigham had to be like Sherlock Holmes."

Massachusetts hospitals have dealt with several water-born bacterial pathogens in recent years. In 2020, Brigham and Women's saw a number of infections and three patient deaths from the bacteria Burkholderia cepacia, after patients were contaminated from a type of life support known as extracorporeal membrane oxygenation, which oxygenates a person's blood outside of their body. In December, Franciscan Children's hospital had 36 children test positive for the same bacteria; officials suspected it originated in the tap water.

M abscessus is rare for hospitals to see, with outbreaks often associated with water systems such as heater-cooler devices used for patients undergoing cardiac bypass and hospital plumbing systems. Though usually of little threat to healthy individuals, infections can be problematic for vulnerable patients and require large quantities of antibiotics to treat, Ellerin said.

In June 2018, Brigham's infection control department was alerted to three cardiac surgery patients who developed an invasive infection from the bacteria. Two of the patients had surgically implanted heart pumps known as left ventricular assist devices. Another was a cardiac surgery patient who was immunocompromised.

Klompas said one of the initial challenges was recognizing something was even going on, given the small number of cases with many months in between.

"We get these alerts from various clinicians on a regular basis, and often investigate and find nothing," Klompas said. "But this we looked at, and said this is unusual, and dove deeper."

But were there other patients? The hospital searched its own microbiology database going back to 2015, looking for patients at the hospital for a given stretch of time who had a culture that tested positive for the bacteria. That search unveiled a fourth infected patient, also with a left ventricular assist device.

The key question: Was there was a central source inside the hospital? All four men, over the age of 50, had been admitted to the cardiac surgery intensive care unit and a stepdown unit, located on a single floor of the hospital, each very ill and hospitalized for a period of weeks to months.

It wasn't immediately clear what else the patients had in common. Three of the four had surgery at the Brigham but all in different operating rooms with different devices, and the infection had shown up weeks after their cardiac surgeries. The patients had occupied multiple and largely different rooms. Three of the four had been intubated for long periods of time. However for two of those patients, there were months between when they were on a ventilator and when the bacteria showed up, leading officials to conclude the ventilators likely weren't the collective source.

But bacteria carry a genetic fingerprint, which would tell the hospital if the patients had been infected with the same strain — and from the same source. Doing such sequencing required help from a research lab at Harvard's School of Public Health.

Most strains are unrelated, and investigations stop there. But in this case, the genetic strains were near perfect matches.

The hospital took cultures from sinks and showers of each of the rooms occupied by patients, but mycobacteria levels were nonexistent or too low, ruling it out as a likely source. But experts did find high levels of mycobacteria from ice and water machine samples on the cardiac surgery intensive care unit and stepdown unit. DNA extracted from the machine samples was an exact match to a gene in the patient outbreak.

Records showed the machines had been cleaned and maintained properly. But further testing unveiled that chlorine levels in the problematic units were undetectable, due to a commercial water purification system the hospital had installed in the plumbing lines leading to these units. The filter included a carbon filter and an ultraviolet irradiation unit, both of which decrease chlorine concentrations. The system was designed to improve the taste, odor, and purity of the water, but allowed the bacteria, normally killed off by chlorine, to proliferate.

"You'd not be surprised if other hospitals and health systems have similar water systems in place, put in with the best of intentions," Klompas said. "You'd think putting a filter in would make the water better. Lo and behold, it has unintended consequences. That was the reason for publication."

According to the study, mycobacteria likely originated from municipal water, which often have low concentrations of the bacteria. Experts suspect that the infected patients may have been particularly prone to infection, given their long lengths of stay. Nurses noted that these patients in particular consumed large amounts of ice.

Beyond removing the problematic ice and water machines and the purification system, the hospital changed how and how frequently it cleaned and maintained its ice and water machines.

The hospital also now uses sterile, distilled, or filtered water for both drinking and patient care for its most vulnerable patients.

Tap water "is fine for you and me and whoever is healthy. Our immune systems can take care of it. But if you are vulnerable, you might not be able to," Klompas said.

Ellerin, of South Shore Health, said there are lessons for other health systems about the need for more comprehensive hospital surveillance of its water systems. The study is also a critical reminder of the importance of reducing exposure of a hospital's most vulnerable patients to tap water.

No additional cases of hospital-acquired M abscessus had occurred through September 2022.

Klompas said the outbreak is a warning sign that the national standards of monitoring water inside a hospital — usually focused on Legionnaire's infections — might not be stringent enough.

"Turns out that things good enough to get rid of Legionella might not be good enough to get rid of mycobacteria," Klompas said. "This is a further [area of focus] for federal regulators ... to reduce risk of mycobacteria."

Jessica Bartlett can be reached at jessica.bartlett@globe.com. Follow her on Twitter @ByJessBartlett.

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EXHIBIT 2

Annals of Internal Medicine ORIGINAL RESEARCH

Mycobacterium abscessus Cluster in Cardiac Surgery Patients Potentially Attributable to a Commercial Water Purification System

Michael Klompas, MD, MPH; Chidiebere Akusobi, MD, PhD; Jon Boyer, ScD, CIH; Ann Woolley, MD; Ian D. Wolf; Robert Tucker, MPH, CIC; Chanu Rhee, MD, MPH; Karen Fiumara, PharmD; Madelyn Pearson, DNP; Charles A. Morris, MD, MPH; Eric Rubin, MD, PhD; and Meghan A. Baker, MD, ScD

Background: Nontuberculous mycobacteria are water-avid pathogens that are associated with nosocomial infections.

Objective: To describe the analysis and mitigation of a cluster of *Mycobacterium abscessus* infections in cardiac surgery patients.

Design: Descriptive study.

Setting: Brigham and Women's Hospital, Boston, Massachusetts.

Participants: Four cardiac surgery patients.

Intervention: Commonalities among cases were sought, potential sources were cultured, patient and environmental specimens were sequenced, and possible sources were abated.

Measurements: Description of the cluster, investigation, and mitigation.

Results: Whole-genome sequencing confirmed homology among clinical isolates. Patients were admitted during different periods to different rooms but on the same floor. There were no common operating rooms, ventilators, heater-cooler devices, or dialysis machines. Environmental cultures were notable for heavy mycobacterial growth in ice and water machines on the cluster unit but little or no growth in ice and water machines in the hospital's other 2 inpatient towers or in shower and sink faucet water in any of the hospital's 3 inpatient towers. Whole-genome sequencing confirmed the presence of a genetically identical element in ice and water machine and patient specimens. Investigation of the plumbing system revealed a commercial water purifier with charcoal filters and an ultraviolet irradiation unit leading to the ice and water machines in the cluster tower but not the hospital's other inpatient towers. Chlorine was present at normal levels in municipal source water but was undetectable downstream from the purification unit. There were no further cases after high-risk patients were switched to sterile and distilled water, ice and water machine maintenance was intensified, and the commercial purification system was decommissioned.

Limitation: Transmission pathways were not clearly characterized.

Conclusion: Well-intentioned efforts to modify water management systems may inadvertently increase infection risk for vulnerable patients.

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Mycobacterium abscessus is a rare but well-described nosocomial pathogen (1, 2). Health care-associated outbreaks have been attributed to contaminated aqueous systems, including heater-cooler devices used for patients undergoing cardiac bypass, hospital plumbing systems, ice and water machines, humidifiers, medications, and disinfectants (3-8). We report on a nosocomial cluster of *M abscessus* infections in 4 cardiac surgery patients and the steps we took to investigate and abate the cluster. These infections occurred sporadically between March 2017 and October 2018, were all associated with 1 inpatient floor, and were ultimately attributed to *M abscessus* contamination of ice and water machines. Proliferation of the organism in water and ice machines may have been facilitated by a commercial water purification system that was installed to improve water palatability but was inadvertently removing chlorine from the supply lines feeding ice and water machines in the affected area of the hospital.

Methods

Setting and Case Definition

Brigham and Women's Hospital is an 803-bed acute care tertiary referral center in Boston, Massachusetts. In June 2018, the infection control department was alerted to 3 cardiac surgery patients who developed invasive *M abscessus subsp. abscessus* infections, including 2 patients with left ventricular assist devices and 1 patient who was immunocompromised. An investigation was initiated to identify additional cases and to assess for commonalities among patients. Additional cases were sought by searching the hospital's microbiology database for the years 2015 to 2018. A case was defined as a patient with positive results on clinical cultures for *M abscessus* acquired more than 1 week after admission or within 3 months of an admission that lasted for at least 1 week.

Investigation Steps

Commonalities among cases were sought, including the operating rooms and heater-cooler devices used for cardiac surgeries, the inpatient hospital floor and specific rooms occupied by case patients, exposure to specific ventilators and other respiratory support devices, exposure to specific dialysis machines, and medications. In addition, water samples were obtained from faucets in all rooms occupied by case patients and from the 2 ice and water machines on the cardiac surgery floor where all case patients were located. Sampling took place in October 2018. These samples were pelleted and plated on mycobacteria-selective media, Löwenstein-Jensen agar, and 7H10 with 100-mg/mL malachite green. The cardiac surgery floor included both intensive care and

stepdown-level care patients. Over the course of the investigation, a fourth patient was identified and added to the investigation after being diagnosed with an *M abscessus* infection while on a left ventricular assist device.

Clinical specimens were sent for whole-genome sequencing. Mycobacterial specimens recovered from the ice and water machines on the clinical unit were also sequenced. After the discovery of mycobacterial contamination of ice and water machines in the index unit, ice and water specimens were obtained from ice and water machines on clinical units throughout the hospital to assess the extent of colonization, including on additional floors in the inpatient tower housing the cardiac surgery unit and in the hospital's 2 other inpatient towers. These specimens were assayed for mycobacteria, *Legionella*, heterotrophic plate counts, and chlorine levels. In addition, maintenance logs and cleaning logs for all ice and water machines were reviewed and compared with the manufacturers' instructions.

Discovery of low chlorine levels in ice and water machines in 1 inpatient tower but not in water faucets in the same tower or ice and water machines in the hospital's other 2 inpatient towers led to an investigation of the plumbing system in the implicated tower.

Role of the Funding Source

The hospital investigation was conducted under the auspices of hospital operations without external funding. Cultures and sequencing were performed under a grant from the National Institutes of Health. The funder had no role in the design, conduct, or analysis of the study.

RESULTS

Summary of Case Patients and Sequencing Results

The 4 case patients were diagnosed with *M abscessus* infections between March 2017 and October 2018. Three of the 4 patients had left ventricular assist devices, and the fourth was a cardiac surgery patient who was immunocompromised. All were men, and their average age was 62 years (range, 50 to 72 years). Two patients had bloodstream infections, 1 had a left ventricular assist device driveline infection, and 1 had a sternal wound infection that subsequently disseminated, with positive culture results for *M abscessus* at multiple additional body sites. All 4 patients were aggressively treated with multiagent antimycobacterial regimens. Three of the 4 patients died. Review of the hospital's microbiology records from 2015 through 2018 did not reveal any additional cases of *M abscessus* infection acquired more than 1 week after admission or within 3 months of an admission that lasted for at least 1 week. Whole-genome sequencing of the 4 clinical isolates suggested they were closely related, with 1 to 3 single-nucleotide polymorphism (SNP) differences among all 4 isolates (prior *M abscessus* transmission studies have found that SNP differences of fewer than 20 to 40 base pairs in specimens with potential epidemiologic links suggest a common source or recent transmission) (9, 10).

Initial Assessment of Commonalities

In all cases, there were substantial intervals between cardiac surgery and the initial positive culture result for *M abscessus* (median, 130 days; range, 83 to 528 days). Three of the 4 patients' cardiac surgeries occurred at Brigham and Women's Hospital, but the fourth patient underwent surgery at a different hospital. The 3 cardiac surgeries at Brigham and Women's Hospital were done in different operating rooms using different cardiopulmonary bypass heater-cooler devices. Only 1 of the 4 patients required hemodialysis before their index *M abscessus* infection. This heterogeneity suggests that the cluster was unlikely to be attributable to cardiac surgery, heater-cooler devices, or hemodialysis.

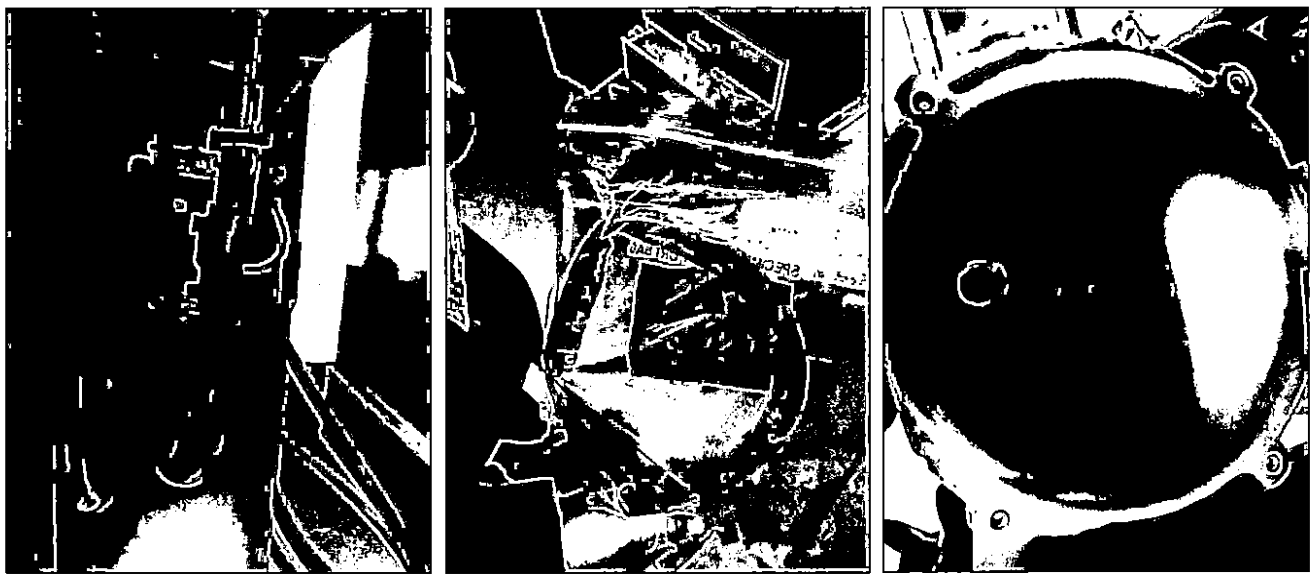
All 4 patients were admitted to the cardiac surgery intensive care and stepdown units on a single floor of the hospital for substantial periods. All 4 had very long admissions before their index cultures, with a median length of stay before first positive culture of 76 days and a range of 42 to 131 days; this is substantially longer than the mean length of stay (15.7 days) for patients with left ventricular assist device placements at Brigham and Women's Hospital. Each patient occupied multiple rooms, with only 1 room (which was occupied by 2 of the 4 patients) in common among the patients. Only 3 of the 4 patients required prolonged mechanical ventilation, and in 2 of these cases, at least 2 months passed between discontinuation of mechanical ventilation and the first positive culture result, suggesting that the cluster was not attributable to mechanical ventilation.

Water and Environmental Cultures From Cluster Unit

Cultures were obtained from the sinks and showers in each of the rooms occupied by case patients as well as the 2 ice and water machines on the cardiac surgery intensive care unit and the adjacent stepdown unit. Two of the 14 water specimens obtained from sink and shower faucets were positive for low levels of mycobacteria (10 and 50 colony-forming units per milliliter, respectively; not speciated). However, water specimens from the floor's 2 ice and water machines were both positive for high concentrations of mycobacteria (2000 and 8000 colony-forming units per milliliter, respectively; not speciated).

The positive mycobacterial screening specimens prompted additional sampling from the 2 ice and water machines on the case patients' floor for speciation and sequencing. These were positive with multiple colonies; 32 colonies were sent for 16S sequencing and were positive for *M abscessus* (8 of 32 colonies), *M vulneris* (3 of 32), *M lentiflavum* (3 of 32), *M peregrinum* (3 of 32), *Nocardia takedensis* (12 of 32), and 3 other organisms that could not be identified. Whole-genome sequencing of the *M abscessus* colonies isolated from the ice and water machines indicated that none matched the clinical isolates recovered from case patients. We therefore used an alternative strategy to identify the outbreak strain in ice and water machine samples wherein we directly probed for genetic material in ice and water machine samples to see whether distinct genetic sequences matching the outbreak strain were present (rather than first growing an

Figure 1. Biofilm on ice and water machine tubing and inside the ice reservoir despite routine servicing per the manufacturer's instructions.



organism in solid media and then sequencing the organism). Direct DNA extraction from ice and water machine samples yielded an exact match to a gene present in the clinical outbreak specimens (Mab0007; 0 SNP differences). A search using the National Center for Biotechnology Information's Basic Local Alignment Search Tool for the Mab0007 allele confirmed that Mab0007 has never been identified in any other locations or contexts, further suggesting an association between the ice and water machines and the outbreak.

Maintenance procedures and records for the cardiac surgery floor's ice and water machines were reviewed. The manufacturer's instructions for use recommend cleaning the internal components of the machines twice per year with dilute bleach solution (Hoshizaki America, Inc.). Hospital records confirmed that the ice machines were being cleaned per the manufacturer's instructions. Nonetheless, visual inspection of the internal components of the 2 ice and water machines located on the case patients' floor found large amounts of biofilm (Figure 1).

Evaluation of Hospital Ice and Water Machines, Faucets, and Plumbing

The recovery of a wide array of mycobacteria in the ice and water machines on the cardiac surgery floor prompted sampling of water faucets and ice and water machines throughout the hospital in order to assess the extent of contamination. Mycobacterial levels were substantially higher in samples obtained from ice and water machines in the inpatient tower that housed case patients than in sink and shower faucets in the same inpatient building or ice and water machine specimens and sink and shower faucets in the hospital's other 2 inpatient towers (Table). Chlorine assays were also notable for substantial differences between water sources within the cardiac surgery inpatient tower and relative to the hospital's other 2 inpatient towers. Chlorine levels obtained from faucets in all 3 buildings were acceptable (mean, 2.5 mg/L), as were most specimens obtained from ice and water machines in the 2 noncluster inpatient towers, but chlorine was undetectable (0 mg/L) in ice and water specimens drawn from the ice and water machines in the inpatient tower that housed case patients. Cultures for *Legionella pneumophila* obtained from all 3 inpatient towers (118 ice and water machine specimens and 63 shower and sink faucet water specimens) all showed negative results.

The discovery of high levels of mycobacterial contamination and aberrantly low chlorine levels solely in the ice and water machines of only 1 of the hospital's 3 inpatient towers prompted a review of the plumbing infrastructure specific to the ice and water machines in that tower. This led to identification of a commercial water purification system specific to the plumbing lines feeding the building's ice and water machines (Figure 2). This system included a 5.0-micron carbon filter designed to improve taste and remove odors as well as an ultraviolet disinfection unit. Assays of water in the input pipes versus the output pipes of the purification system confirmed a substantial decrease in chlorine levels, from 2.5 to 0 mg/L.

Mitigation Measures

The affected ice and water machines were taken out of service in October 2018, and all cardiac surgery patients were switched to bottled or sterile water alone for both drinking and patient care. The hospital-wide service protocol for ice and water machines was overhauled to require quarterly maintenance using the manufacturer's instructions for semiannual maintenance, including replacement

Table. Mycobacterial Assays on Water and Ice Specimens Drawn From 3 Inpatient Towers at Brigham and Women's Hospital, Boston, Massachusetts

Source of Specimen	Any Mycobacteria, *n/N (%)*	Mycobacterial Level >500 CFU/mL, *n/N (%)*	Mean Mycobacterial Level, *CFU/mL*
Building 1*			
Ice machine water	11/13 (85)	7/13 (54)	5782.3
Ice machine ice	11/16 (69)	6/16 (38)	2052.2
Sinks and showers	5/39 (13)	0/39 (0)	2.1
Building 2			
Ice machine water	8/29 (28)	3/29 (10)	637.2
Ice machine ice	16/49 (33)	1/49 (2.0)	39.7
Sinks and showers	7/43 (16)	1/43 (2.3)	42.4
Building 3			
Ice machine water	0/4 (0)	0/4 (0)	NA
Ice machine ice	3/6 (50)	0/6 (0)	10.0
Sinks and showers	1/2 (50)	0/2 (0)	10.0

CFU = colony-forming units; NA = not applicable.
* All case patients were located in Building 1.

of all interior tubing and the ice storage bin. Technicians servicing ice and water machines were trained on best practices to avoid inadvertent contamination during cleaning and servicing. Environmental Services staff protocols were revised to include daily cleaning of ice and water machine drip trays. A centralized audit system was created to monitor the quality and frequency of preventive maintenance and daily cleaning of ice and water machines. In addition, high-efficiency particulate filters (0.005 micron) were installed in the water lines feeding all ice and water machines throughout the hospital. The commercial water purification system for the ice and water machines in the case patients' hospital tower was removed from service. The hospital water management plan was revised to codify these system-level changes, to expand the hospital's annual water surveillance audits to include cultures for mycobacteria in addition to *Legionella*, and to extend routine chlorine audits to include ice and water machines in addition to faucets. Review of hospital microbiology records through September 2022 suggests that there have been no additional cases of potentially hospital-acquired *M abscessus* infection in the ensuing 4 years.

DISCUSSION

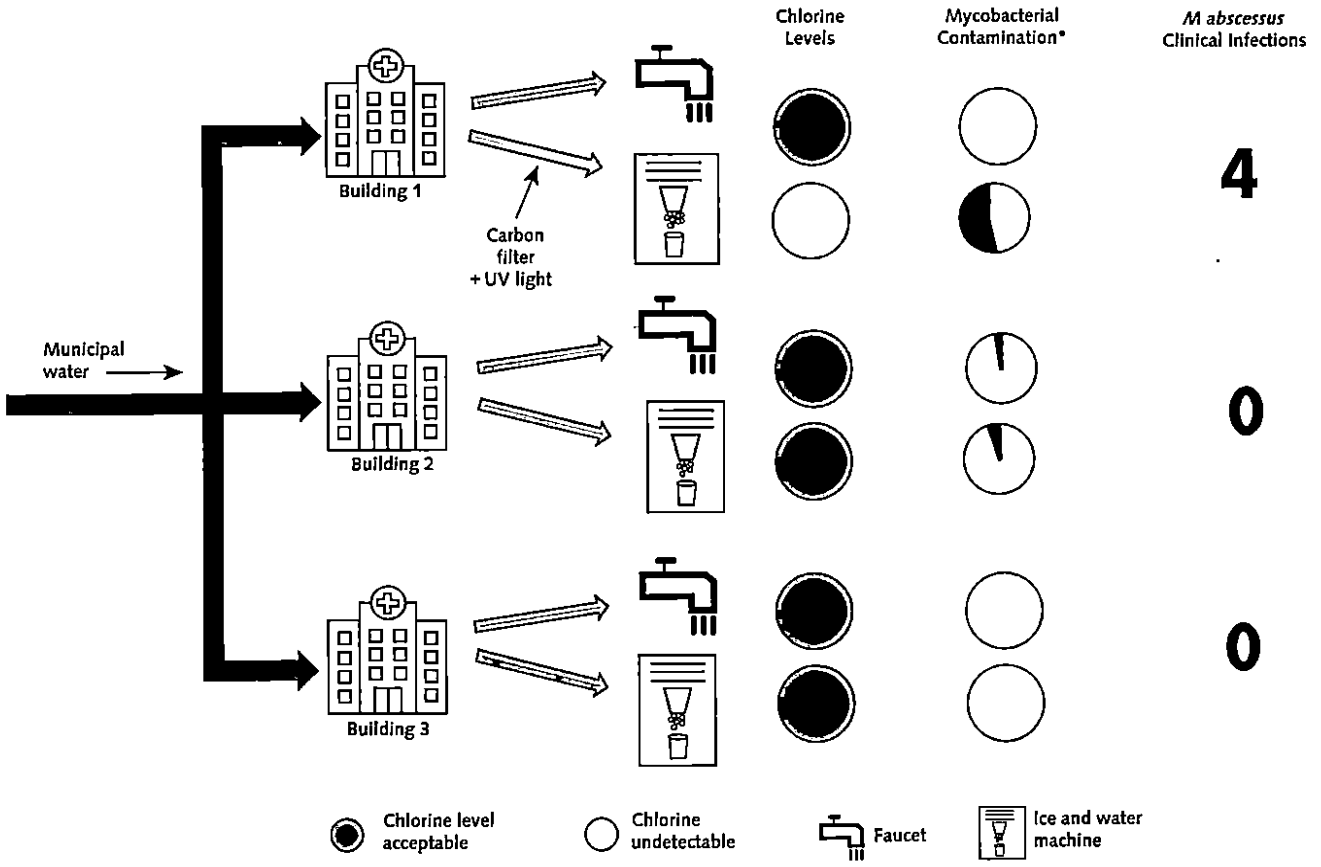
We report on 4 severe mycobacterial infections in cardiac surgery patients that were potentially attributable to contamination of ice and water machines. Notable findings included nearly identical genetic sequences among case patients' mycobacterial isolates (suggesting a common source or transmission between patients), nonoverlapping admissions and long intervals between case patients (making direct transmission between patients unlikely), patients' unusually long hospitalizations before infection (suggesting high levels of cumulative exposure to a potential point source), colonization of the ice and water machines on the inpatient floor occupied by case patients with a genetically identical *M abscessus* strain (suggesting this may have been the common source), unusually low chlorine levels in the ice and water machines on the patients' floor (which may have facilitated mycobacterial colonization and proliferation), and the presence of an inline commercial water purification system with a carbon filter and an ultraviolet irradiation unit feeding the ice and water machines in the building housing case patients but not the other 2 buildings (carbon filters and ultraviolet light both decrease chlorine concentrations) (11).

These findings suggest that the mycobacterial cluster may have been attributable to the commercial water purification system depleting chlorine levels and facilitating mycobacterial colonization and proliferation in ice and water machines located on the case patients' floor. Mycobacteria were likely introduced into the hospital's water system via municipal water, which is often colonized with low concentrations of mycobacteria (12–15). Municipal water was used for ice making, for water dispensing, and for diluting bleach to clean the ice and water machines. Even if chlorine levels are maintained, ice and water machines are prone to colonization with water-avid pathogens due to intermittent periods of decreased use leading to stagnation and proliferation (16, 17). The presence of biofilm may further facilitate mycobacterial proliferation. Case patients may have been particularly prone to infection because their long stays led to high cumulative levels of exposure to ice and water machine products relative to other patients. Nurses anecdotally noted that case patients consumed large amounts of ice relative to other patients. Patients may also have been exposed via ice and water machine products used for drinking and patient care activities, such as cleaning and medication preparation.

Our experience suggests the potential danger of well-intentioned measures designed to improve water quality in health care facilities. The commercial water unit was installed to improve the taste of patients' water and to minimize odors but may have had the unintended consequence of facilitating microbial colonization and proliferation. This echoes the experience of other hospitals that have reported that well-intentioned measures to improve water management (for example, increasing water recirculation in order to reduce energy use for heating) may inadvertently increase infection risk for patients by depleting chlorine and facilitating microbial proliferation (4).

Hospitals must be particularly attentive to the threat of water-based infections. The literature has many reports of nosocomial infections attributable to water-based systems, including colonization of faucets, drains, water baths, heater-cooler reservoirs, aqueous solutions, and even disinfectants (4–6, 18, 19). Increasing recognition of the threat posed by water systems to vulnerable patients has led some hospitals to develop protocols to minimize exposure to water in general and tap ice and water in particular for patients who are critically ill or immunocompromised. Measures include switching to sterile or distilled water for all patient care, adding submicron filters to faucets, removing sinks from patient rooms, and regularly disinfecting sink drains with bleach foam or other antiseptics (2, 5, 20–22). These measures have been associated with significant decreases in the incidence of patient infections due to water-avid pathogens, including gram-negative bacteria and nontuberculous mycobacteria.

Figure 2. Schematic of the hospital plumbing system and association with chlorine levels, mycobacterial contamination in samples from faucets and from ice and water machines, and patient infections in each of the hospital's 3 inpatient towers.



M abscessus = *Mycobacterium abscessus*; UV = ultraviolet.
* Percentage of samples growing >500 colony-forming units of *Mycobacterium* species per milliliter.

In addition, the experiences of our hospital and others with nosocomial mycobacterial and resistant gram-negative infections that are potentially attributable to water-based systems suggest that current water management standards for U.S. hospitals may be inadequate. Current water regulations for hospitals focus primarily on preventing nosocomial *Legionella* infections, including a requirement to culture hospital water systems for *Legionella* at least twice a year. However, measures that are adequate to prevent *Legionella* may not be adequate to prevent colonization and proliferation of mycobacteria (14, 15). This suggests the potential importance of modifying hospital water management standards and monitoring systems to minimize contamination and proliferation of mycobacteria and water-avid gram-negative bacteria in addition to *Legionella*, particularly in hospitals serving immunocompromised populations and patients prone to long stays. Potential measures may include regular surveillance for hospital-acquired infections due to water-avid pathogens, routine sampling for mycobacteria and selected water-avid gram-negative bacteria, regular chlorine monitoring, and more rigorous servicing protocols for ice and water machines. However, regulators will need to specify maximum exposure thresholds for some pathogens, as colonization of municipal water supplies with some mycobacterial species is ubiquitous and sterility is not a realistic goal (12–15). Regulators may also wish to encourage clinicians to adopt modified care protocols designed to minimize vulnerable patients' exposure to unfiltered tap water.

Limitations of our study include the small number of case patients, which limited our capacity to formally assess risk factors for transmission, and the possibility that the association between patient infections and the organisms isolated from ice and water machines was spurious, as genetically similar isolates of *M abscessus* have occasionally been identified in widely separated populations without identifiable epidemiologic links (10, 23). However, in this case there were strong epidemiologic and genetic links between case patients and ice and water machines and no clear link with specific patient rooms, operating rooms, heater-cooler devices, mechanical ventilators, or dialysis machines. We did not clearly establish a transmission pathway from ice and water machines to patients, and the association between the commercial water purification system and our patients' infections may be specious given that many other

patients were hospitalized in the tower served by this system and did not acquire mycobacterial infections. However, the depletion of chlorine across the purification system, the capacity for mycobacteria to thrive in low-chlorine environments, the lack of nosocomial mycobacterial infections in the hospital's other 2 inpatient towers, and the lack of additional infections after decommissioning of the purification unit suggest a credible connection.

In summary, we document a cluster of severe *M abscessus* infections in cardiac surgery patients that were potentially attributable to contamination of ice and water machines due to chlorine depletion by a commercial water purification system. Our cluster demonstrates the risk for unintended consequences associated with systems designed to improve hospital water, the predilection of ice and water machines for microbial contamination and the risk this poses to patients, as well as the potential importance of augmenting hospitals' water management programs to monitor and prevent mycobacterial infections in addition to *Legionella*. More broadly, our experience reaffirms the potential risks associated with tap water and ice in the care of vulnerable patients and the potential value of emerging initiatives to minimize susceptible patients' exposure to tap water and ice during routine care (2, 5, 20–22).

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