

Public Health Investigations of Water-Associated Organism Infections in Neonatal Intensive Care Units— United States, 2014–2021

Amelia Keaton, MD¹; Ruoran Li ScD^{1, 2}; Janet Glowicz, PhD¹; Matthew Stuckey, PhD¹; Joseph Perz, DrPH¹; Kiran Perkins, MD¹

¹ Division of Healthcare Quality and Promotion, Centers for Disease Control and Prevention, Atlanta, GA ² Epidemic Intelligence Service, Centers for Disease Control and Prevention,

BACKGROUND

- Preterm and critically ill infants in neonatal intensive care units (NICUs) are vulnerable to a wide variety of infections.
- Tap-water is used for many patient care activities in healthcare settings but remains a risk factor for transmission of opportunistic water-related organisms.
- Water-related organisms include a wide variety of Gram-negative bacteria, nontuberculous mycobacteria (NTM), fungi, and protozoa.
- Although water infection control assessment tools are available, these may not capture the unique water exposure pathways for infants in the NICU.
- We sought to identify water exposures that may have contributed to infection within NICUs.

METHODS

- State and local health departments may request technical assistance consultations from Centers for Disease Control and Prevention when investigating infections or outbreaks in healthcare facilities.
- We reviewed consultations reported to CDC between 2014–2021 for those meeting the following criteria:
 - Consultations involved at least one infection in a NICU patient AND
 - Infections were caused by a water-related organism (excluding *Legionella* species)
- We compiled available information on number of patients involved, types of infections identified, and plausible or confirmed exposure pathways.

RESULTS

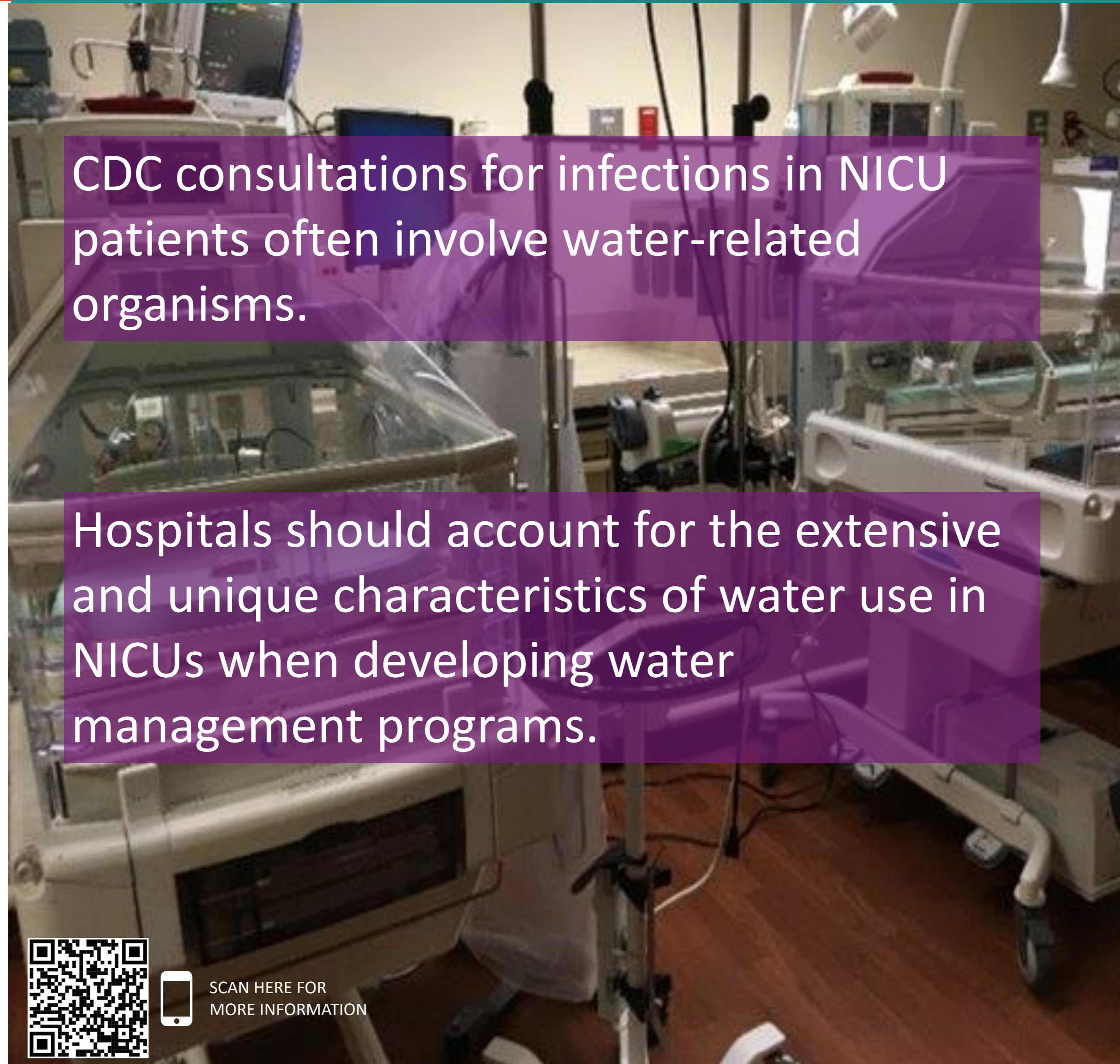
- CDC received 92 consultations involving infections in NICU patients; of these consultations, 30 (33%) were due to water-related organisms.
- Collectively, water-related organisms were isolated in at least 178 NICU patients, with infection types ranging from asymptomatic colonization to bloodstream infections and sepsis.
- The most frequently identified organisms among these consultations were *Serratia* spp (n=10; 33%) (Fig. 1).
- Many outbreaks identified more than one possible transmission route (Fig. 2):
 - Use of tap water to rinse surfaces and fill reservoirs of humidified isolettes
 - Inappropriate cleaning and drying of breast pumps and maternal milk expression components.
 - Preparation of formula and medications and storage other patient care items near sinks
 - Contaminated water and sinks basins/counters at handwashing sinks used by all visitors and staff prior to entering the NICU

CONCLUSIONS

- Infections from water-related organisms accounted for one third of all consultations involving NICU patients during the study period.
- Hospitals should account for the extensive and unique characteristics of water use in NICUs when developing water management programs.

CDC consultations for infections in NICU patients often involve water-related organisms.

Hospitals should account for the extensive and unique characteristics of water use in NICUs when developing water management programs.



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Figure 1: Number of CDC consultations for to water-related organisms in NICUs, by organism (n=30)

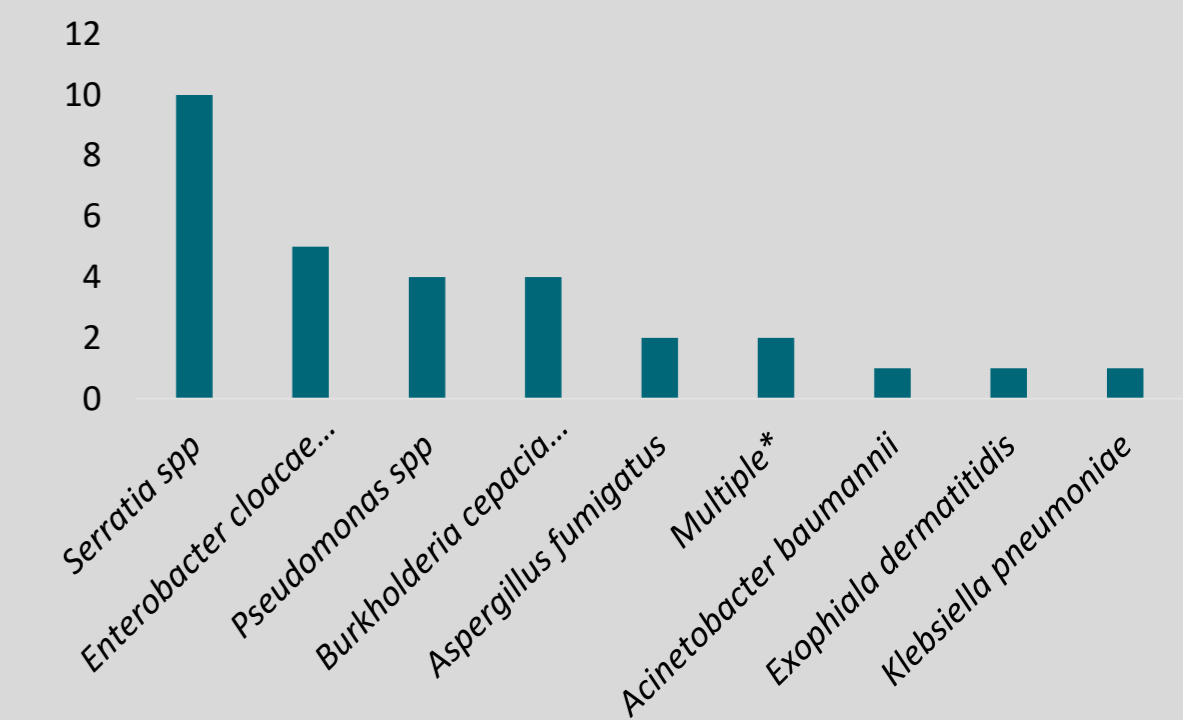


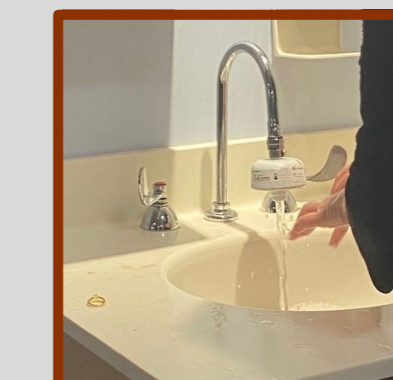
Figure 2: Examples of exposure pathways identified during investigations

Use of tap water to rinse surfaces and fill reservoirs of humidified isolettes



Inappropriate cleaning and drying of breast pumps and maternal milk expression components.

Preparation of formula and storage of other patient care items near sinks



Contaminated water and sinks basins/counters at handwashing sinks used by all visitors and staff prior to entering the NICU

Amelia Keaton, MD MS
akeaton@cdc.gov

