Preventing *Naegleria fowleri* Infections Linked to Water Playgrounds or to Decorative Fountains

Over the past year, CDC has received reports of two children dying of primary amebic meningoencephalitis (PAM) caused by *Naegleria fowleri* (commonly referred to as the "brain-eating ameba") after playing in constructed water venues that spray water. One child died after playing in an inadequately disinfected water playground, and the other child died after playing in a decorative fountain that was not regulated, operated, or managed as a water playground. Decorative fountains can spray water and be mistaken for water playgrounds, but they are not designed or regulated as water playgrounds, meaning there might be no requirement to disinfect the water.

There is no evidence of *Naegleria fowleri* causing infections in properly disinfected water playgrounds. *Naegleria fowleri* can grow in inadequately disinfected water but very rarely infect people in that water. If the public is entering a fountain, it should be regulated, operated, and managed as a water playground, or the public should be discouraged from entering (for example, with a barrier or signage).

The sections below:

- Describe *Naegleria fowleri*, two types of constructed water venues that spray water, and recent fatal PAM cases in young children
- Provide recommendations for how operators and environmental health staff can help keep aquatic experiences healthy and safe

Background

Naegleria fowleri can infect people when water containing the ameba enters the body through the nose. The ameba can travel from the nose to the brain and cause PAM, which is almost always fatal. In the past decade, 33 cases have been reported in the United States. Although *Naegleria fowleri* are more commonly found in warm freshwater (such as in lakes and rivers), in rare instances, *Naegleria fowleri* also can be found in inadequately disinfected constructed water venues, such as water playgrounds and decorative fountains. Visit CDC's Naegleria website for more information.

Water playgrounds are also known as interactive fountains, splash pads, spray pads, spray parks, and wet decks. Water playgrounds are aquatic venues that spray or jet water on users. Like water playgrounds, decorative fountains can spray water and look like water playgrounds. Decorative fountains are primarily designed to be part of the landscape architecture. They are not regulated as water playgrounds, and thus might not be required to disinfect the water.

Case 1: In late August 2021, a 3-year-old child played in a water playground and developed PAM. The child died 16 days after playing in the water playground. The water playground had water that was recirculated and had filtration and chlorine disinfection systems. The environmental health investigation found that the operators did not maintain the chlorine level to adequately disinfect the water or document that they did.

Case 2: In late August 2020, a 6-year-old child played in a decorative fountain and developed PAM. The child died 8 days after playing in the decorative fountain. Although the decorative fountain was used as a water playground by the public, it was not regulated, operated, or managed as one. The environmental health investigation found that the chlorine level was not monitored, and chlorine was not added regularly or adequately to disinfect the water.

Recommendations for Proper Operation and Management of Water Playgrounds
Operators should follow all applicable local, state, tribal, or territorial pool codes. If the jurisdiction has no pool code, then consult CDC's Model Aquatic Health Code (MAHC; www.cdc.gov/mahc). CDC's MAHC has the following guidance for water playground operation and management to help prevent the spread of germs, including *Naegleria fowleri*:

- Maintain adequate disinfectant level in the water.
  - Minimum free available chlorine of 1.0 ppm (mg/L), if not using cyanuric acid (such as stand-alone cyanuric acid or stabilized chlorine, commonly known as "dichlor" or "trichlor")
  - Minimum free available chlorine of 2.0 ppm, if using cyanuric acid
  - Minimum total bromine of 3.0 ppm
- Maintain pH 7.2–7.8.
- Conduct daily inspection before opening to the public, including ensuring disinfection, secondary disinfection (such as UV and ozone), and recirculation systems and filters are operating and daily inspection for and removal of biofilm on water playground surfaces (such as the tank, spray nozzles, and drains) as required.
- Test free available chlorine or total bromine and pH before opening to the public each day and maintain adequate disinfectant level.
- Test free available chlorine or total bromine and pH every 2–4 hours while open to the public and maintain adequate disinfectant level.
- Maintain water turnover times at 30 minutes or less.
- Ensure drains prevent standing water from collecting in the user activity area.
- Inspect tank regularly and, as needed, clean it.
- Document operation and management activities such as water testing results, response to testing results, and equipment maintenance (such as tank cleaning) and repairs.
- Ensure all staff who handle pool chemicals (such as chlorine, bromine, and acid) are trained in pool chemical safety.
- Test the backflow preventers regularly to ensure they prevent backflow, or back siphonage, into the water distribution system serving the water playground.

Recommendations for Regulating Water Playgrounds and Decorative Fountains that the Public is Entering
Environmental health programs can consult CDC's Model Aquatic Health Code (MAHC) to propose updates to their jurisdiction's code to ensure the design, construction, operation, and management of water playgrounds are addressed. CDC has the following guidance to help prevent the spread of germs, including *Naegleria fowleri*:

- Ensure during plan review of water playgrounds that the
  - Water is from a potable water source or other source approved by the authority having jurisdiction.
  - Size, number, and location of the drains prevent standing water from collecting in the user activity area.
  - Slope prevents surface water from draining into the water playground system during rain events.
- Inspect water playgrounds regularly to ensure code compliance.
- Educate operators about proper operation and management of water playgrounds and jurisdiction requirements.

Most decorative fountains are not designed for public entry. If the public is entering a decorative fountain, it should be regulated, operated, and managed as a water playground.