



# ***Naegleria fowleri***

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- » An amoeba
- » Single celled living organism found in warm fresh water (lakes, rivers, hot springs)
- » Only 1 species of *Naegleria* infects people:

***N. fowleri***

**What is *Naegleria* ?**



- » Heat loving organism (thermophilic)
- » Grows best at temperatures up to 115 °F
- » Less likely to be found in water as temps decline

***N. fowleri***



- » Infection cannot occur from drinking water that is contaminated with *Naegleria*.
- » Infection only occurs when contaminated water goes up into the nose. Infections are rare.
- » Has not been shown to spread via water vapor or aerosol droplets .

***N. fowleri***



# History

## 2011 - St. Bernard and Desoto Parish

- » 2 deaths from use of neti pots
- » Found in home plumbing

## 2013 - St. Bernard Parish

- » 4 year old boy , Slip and slide
- » Water distribution system

## 2014 Summer

- » Monitoring Began



# Currently

- » Chlorine Residual Requirement was raised to 0.5 ppm or greater
- » Systems targeted for sampling are those that have a residual below 0.5 ppm
- » Naegleria testing conducted June – September with additional testing in November and December if a system is found positive



# Testing a System

- » **100L** of distribution system water is filtered through a REXEED Ultra Filter, which is a hemodialysis filter having a very small pore diameter, meaning it will trap everything from amoeba to viruses
- » The filter is then backwashed



- » Resulting eluate is concentrated via high speed centrifugation, resulting in pelleting of the solid particulate material as well as organisms that were trapped in the filter.
- » Concentrate is then plated onto non-nutritive agar with a lawn of *E. coli*; (amoeba “eat” bacteria) and plates are incubated at 42.5°C for 7 days (elevated incubation temp is used as a selection pressure for *Naegleria spp.*, as this genus of amoeba is thermophilic).



- » Plates are observed daily for 7 days for the presence of live amoeba, which will emerge from the concentrate on the plate in search of bacteria.
- » When live amoeba are observed, a small section of the amoeba-positive area is scraped and subjected to a flagella test in molecular-grade, sterile water (only *Naegleria spp* will flagellate when placed into an adverse, nutrient-poor environment); tests are observed frequently for up to 5 hours for the presence of flagellated amoeba.



- » On day 7, after cultures have been examined microscopically for the final time, plates are “harvested” by scraping the contents of the plate into a 15 mL centrifuge tube.
- » Contents of the tube are concentrated into 2 mL volume, which is then split into two 1mL volumes and subjected to DNA extraction followed by confirmatory PCR (PCR primers are specific for the 16S rRNA of *N. fowleri* ).



- » No rapid, standardized testing method
- » Can take weeks to identify the amoeba
- » New detection tests are in development

## Testing Method





# Questions

