

An underwater photograph of a swimming pool. On the left, a waterfall of water cascades over the edge of the pool. A metal ladder is visible on the pool wall. The water is clear blue, and the pool floor is visible at the bottom.

RECREATIONAL WATER ILLNESSES

SNHD Aquatic Health Operations Program 2025



Pools are great for relaxing or swimming, but they can also spread diarrhea and other illnesses.

BUT WHAT ABOUT CHLORINE?

Healthy pools don't have a strong chemical smell.

Pool chemicals kill most germs within minutes, but some live for days!

Do you smell chlorine? It's actually the chemicals that form when chlorine mixes with gunk. These chemicals -not chlorine- make your eyes red and sting, your nose run, and make you cough.



GENERAL AQUATIC VENUE INSPECTIONS

Types of Aquatic Venues

Pools

Activity Pools

Splash Pads

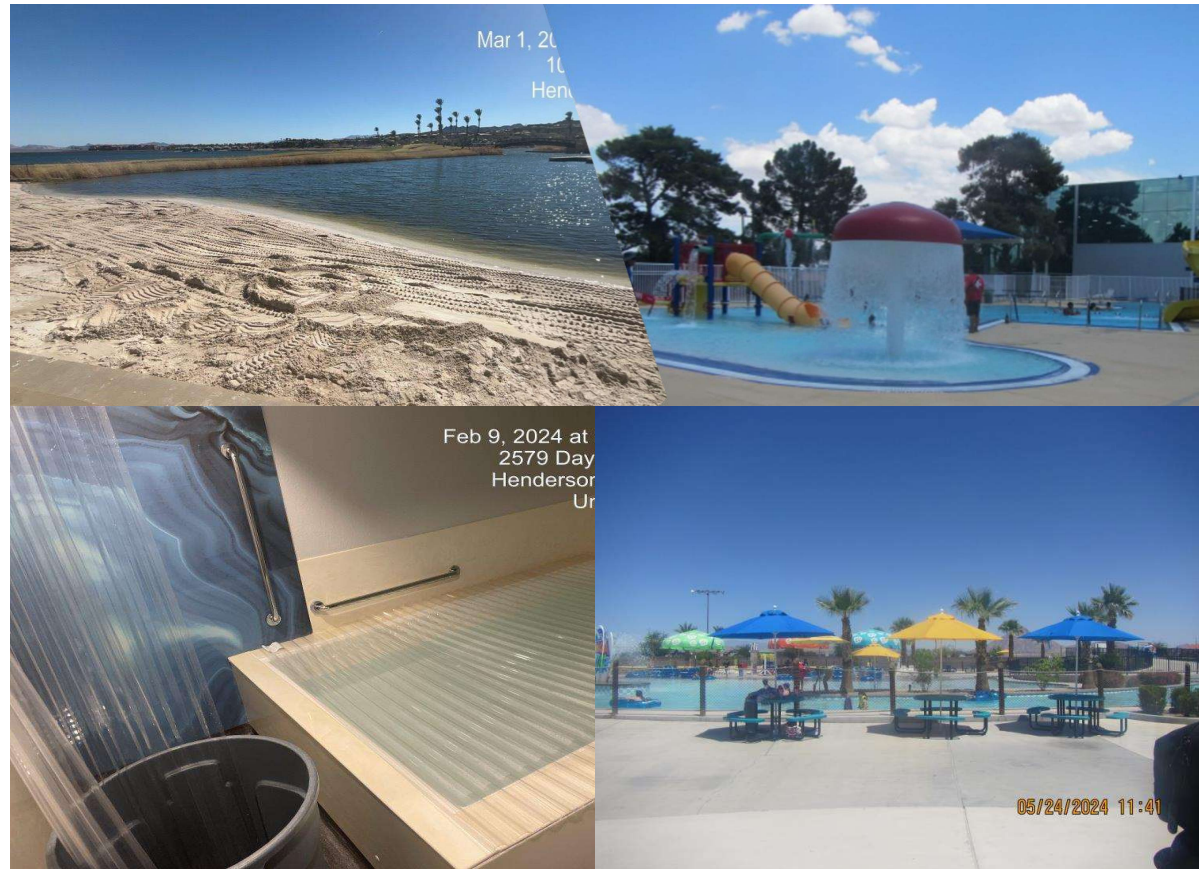
Lazy Rivers

Spas

Natural Bathing Places

Special Use Aquatic Venues

Float Tanks



These Violations are Imminent Health Hazards

- Failure to provide adequate supervision and required staffing.
- Failure to provide required disinfection levels.
- Failure to treat and achieve proper disinfection following contamination event.
- Failure to maintain pH levels between 6.5 and 8.0.
- Failure to continuously operate filtration and disinfection equipment.
- Failure to maintain Cyanuric Acid levels below 100 PRM.
- Use of an unapproved water supply source for portable water observed.
- Absence of all required lifesaving equipment on deck observed.
- Failure to maintain GFCI protection for underwater lighting as required.
- Aquatic venue bottom not visible.
- Total absence or improper marking of depth observed.
- Plumbing cross-connections between drinking water and waste water observed.
- Failure to maintain the barrier to prevent unauthorized access to the aquatic venue.
- Use of unapproved chemicals or application by unapproved methods.
- Broken, unsecured, or missing suction outlet covers observed.
- Broken glass or sharp objects in the venue or on deck observed.

IMMINENT HEALTH HAZARDS

The Aquatic Health Program at SNHD conducts inspections that focus on Imminent Health Hazards found in aquatic venues. Imminent health hazards can pose a serious threat to public health and safety.

Imminent health hazards require immediate correction or cessation of operation to prevent potential injury or illness

CHEMICALS

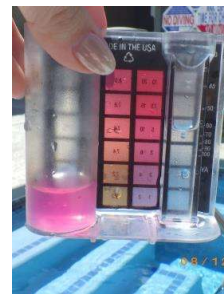
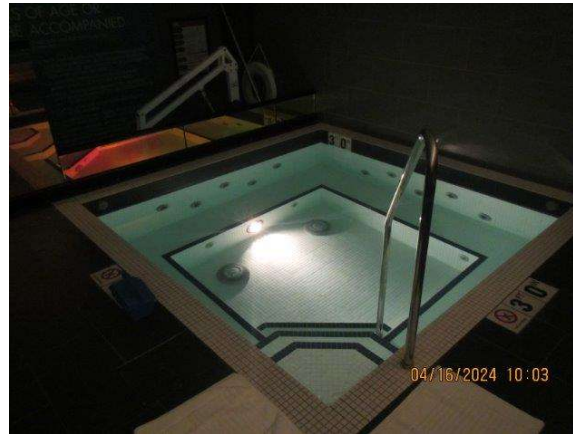
Disinfectants

○Chlorine

- Kills bacteria, viruses, other microorganisms, algae growth, debris and dirt
- Pools (Unstabilized): 1 – 10PPM
- Pools (Stabilized): 2– 10PPM
- Spa: 3 – 10PPM

○Bromine

- Sanitizer, oxidizer, and algaecide
- Works better in hotter temperatures
- Used for indoor facilities
- 3 - 8PPM



CHEMICALS CONTINUED

pH (7.2 - 7.8)

- **Low pH:** Corrosive. Can cause stinging in eyes and nasal passages; dry skin and hair
- **High pH:** Can decrease the ability of chlorine to kill germs

Total Alkalinity: (60 – 180 PPM)

- **Low alkalinity:** Allows for pH to fluctuate too easily at the addition of slight base/acid
- **High alkalinity:** Makes it difficult to adjust pH

Cyanuric Acid (>100 PPM)

- Stabilizer for chlorine to ensure disinfection efficacy, mainly against UV light degradation (from the sun)
- High levels of CYA (>100 ppm) inhibit the efficacy of chlorine and can pose a risk for RWI



RECREATIONAL WATER ILLNESS

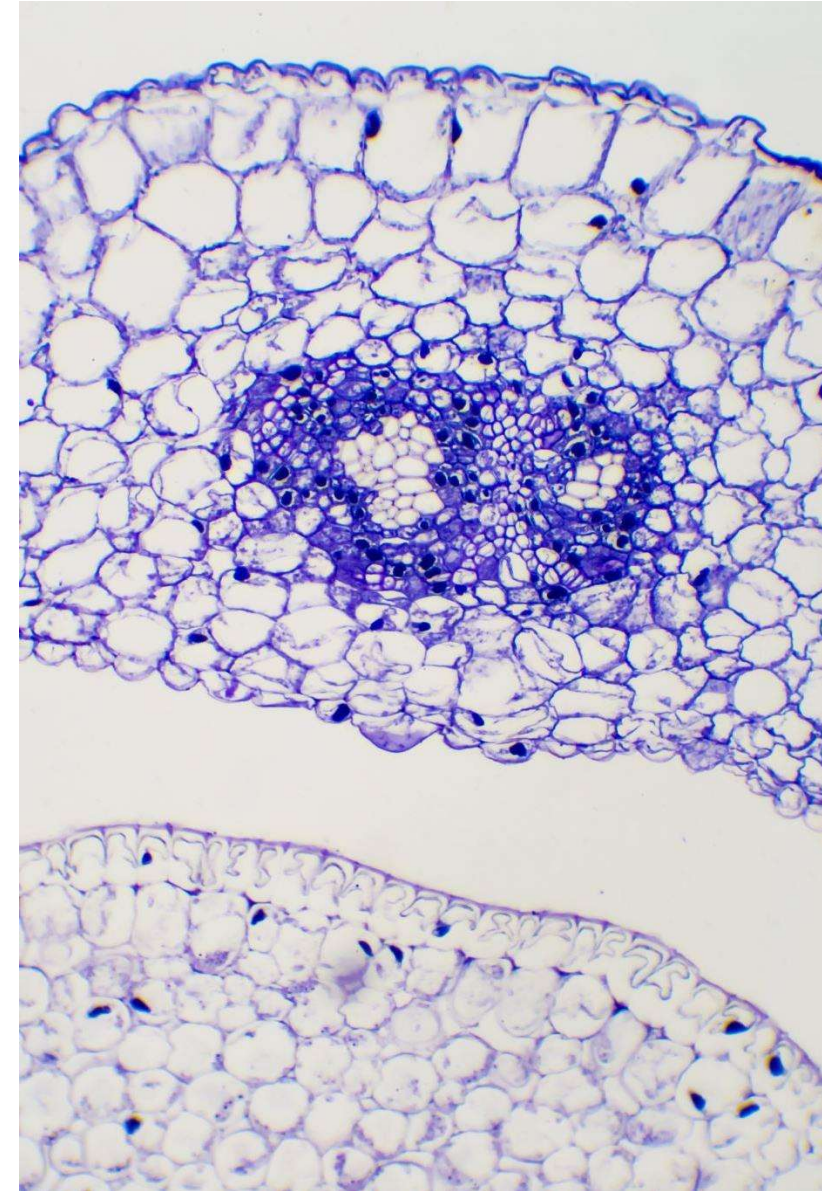
Most commonly occurring in the summer, recreational water illnesses are defined as illnesses that occur after water-related recreational activities.

These illness can be caused by a variety of agents including bacteria, viruses, parasites, algae, and even chlorine gas

NATIONALLY NOTIFIABLE WATERBORNE DISEASES

Nationally Notifiable diseases are diseases that when they are diagnosed, require health care providers by law to report the diagnosis to the state or local public health officials (CDC, n.d.).

Campylobacter	Cholera	Cryptosporidiosis	Cyclosporiasis
<i>Giardia</i>	Hepatitis A	Legionellosis	Malaria
Salmonellosis	Shigellosis	Typhoid Fever	Vibriosis
Yellow Fever			



LEGIONNAIRES' DISEASE

Caused by the *Legionella* bacteria

Legionnaires' disease is a type of severe pneumonia. Symptoms: cough, fever, headaches, muscle aches, and shortness of breath.

Transmission: Inhalation of air droplets/mist that contains the bacteria.

Legionella thrives in temperatures of 68 -113 degrees Fahrenheit

Biofilms provide protection and nutrients which make it more difficult to kill the bacteria.



LEGIONNAIRES PREVENTION & MANAGEMENT

Qualified operators should properly maintain aquatic venues with correct disinfectant and pH levels.

Remove the slime or biofilm layer by scrubbing and cleaning daily.

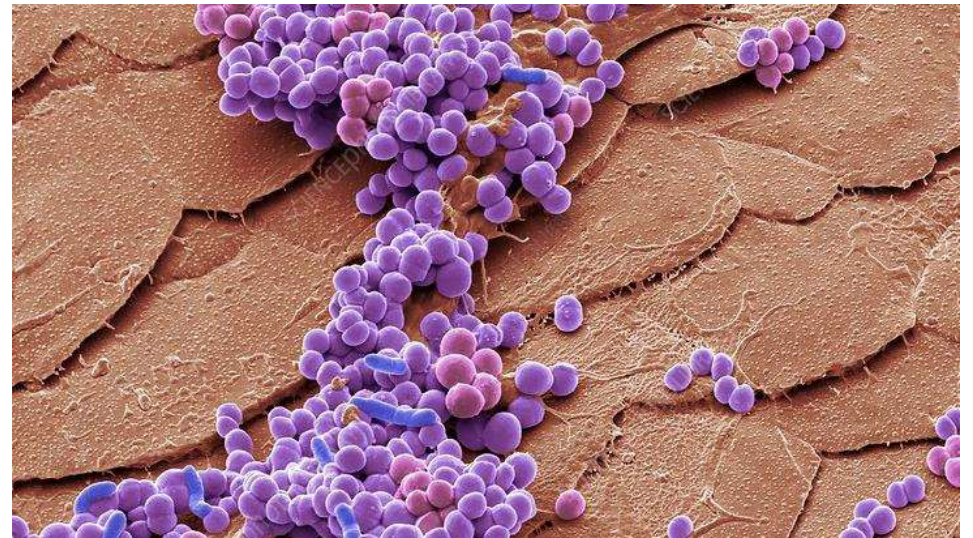


HOT TUB RASH (*PSEUDOMONAS AERUGINOSA*)

Most commonly occurring skin infection that is a result of poorly operated and/or maintained hot tubs and spas

Hot Tub rash presents as red, irritated and/or itchy skin with inflamed follicles

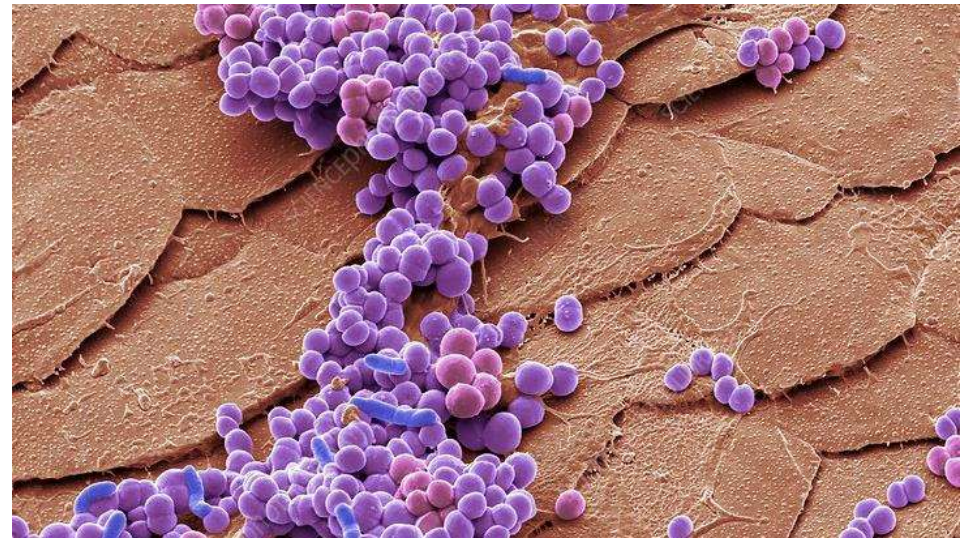
Diarrhea, eye pain, fever, headache, nausea and vomiting, and sore throat may also occur

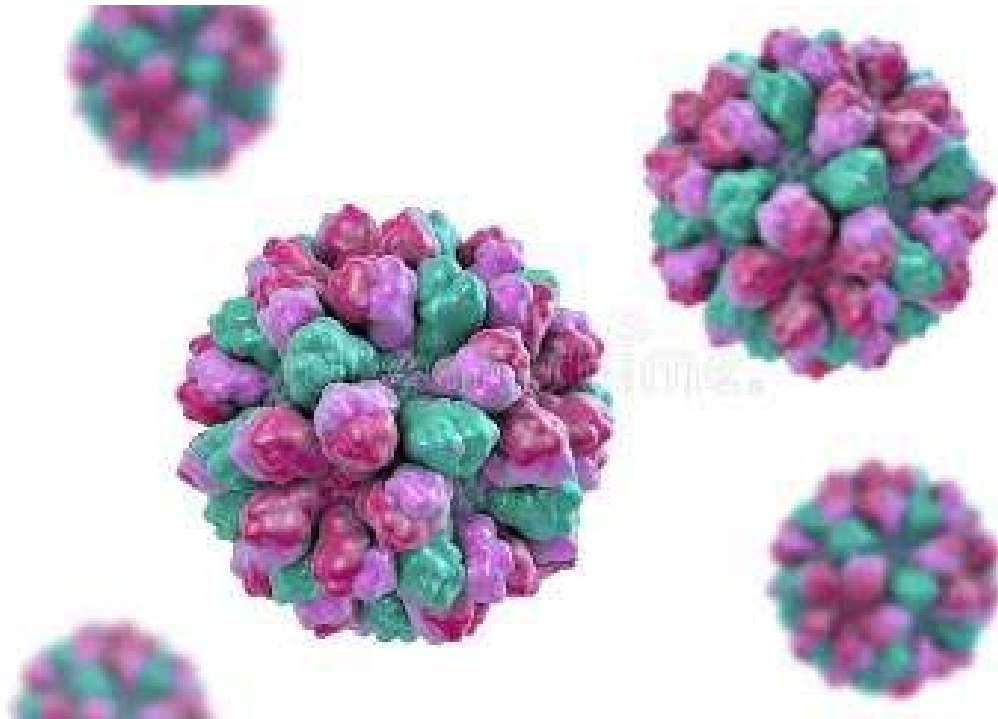


HOT TUB RASH MANAGEMENT & PREVENTION

Operators should maintain balanced pH levels between 7.2 – 7.8 and water temperature levels below 104 degrees Fahrenheit

Bathers should remove wet bathing suits and shower immediately after hot tub/spa use





NOROVIRUS

- A single stranded RNA virus which causes a viral gastroenteritis
- Symptoms: abrupt onset of vomiting or diarrhea
- Transmission through the fecal-oral route
 - Directly
 - Indirectly
 - Person with Norovirus poops or vomits in water
 - Water is improperly treated
- Rare when compared to other RWI



NOROVIRUS MANAGEMENT & PREVENTION

Qualified operator should maintain proper disinfectant and pH levels.

Wash hands well with soap and water; hand sanitizer alone does not work well against norovirus.

Don't swim when sick with Norovirus. The virus can stay in your poop for 2 weeks or more after you feel better.

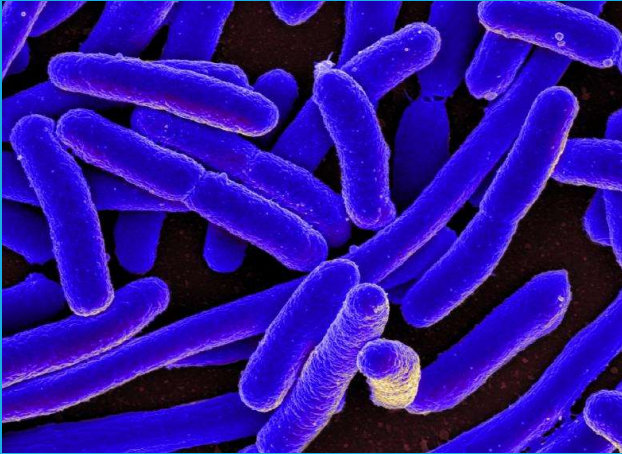
Shower before entering the water.

Don't swallow pool water.

Don't pee or poop in the water.

Every hour — everyone out!

E. COLI 0157:H7



A severe strain of the E. Coli bacteria

Symptoms: Causes a severe intestinal infection in humans. Bloody and non-bloody diarrhea, abdominal cramps, fatigue, nausea

Transmission can occur through ingestion of the *E. Coli* bacterium

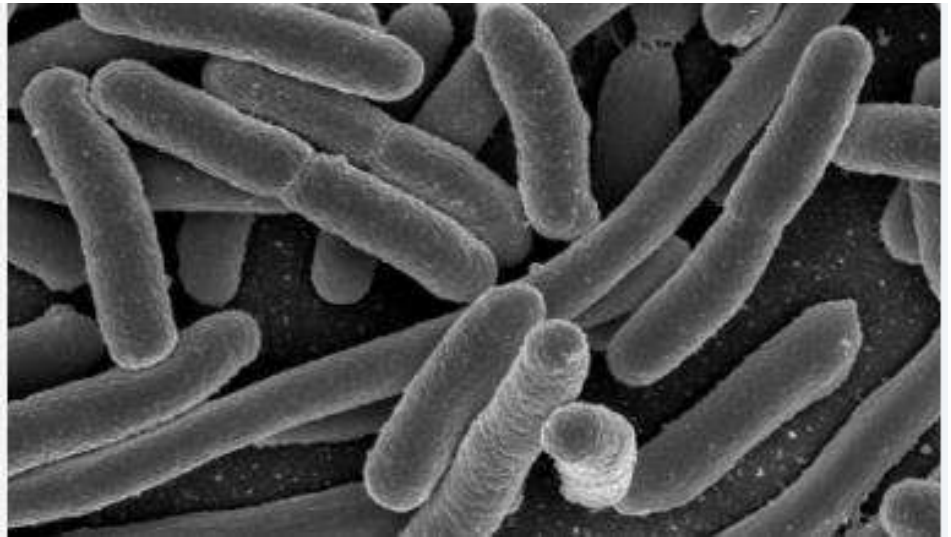
Can survive 1 minute in properly chlorinated pool

E. COLI PREVENTION AND MANAGEMENT

Keep feces/contaminants out
of the water

Check the chlorine level and
pH before getting into the
water

Do not swallow the water you
swim in

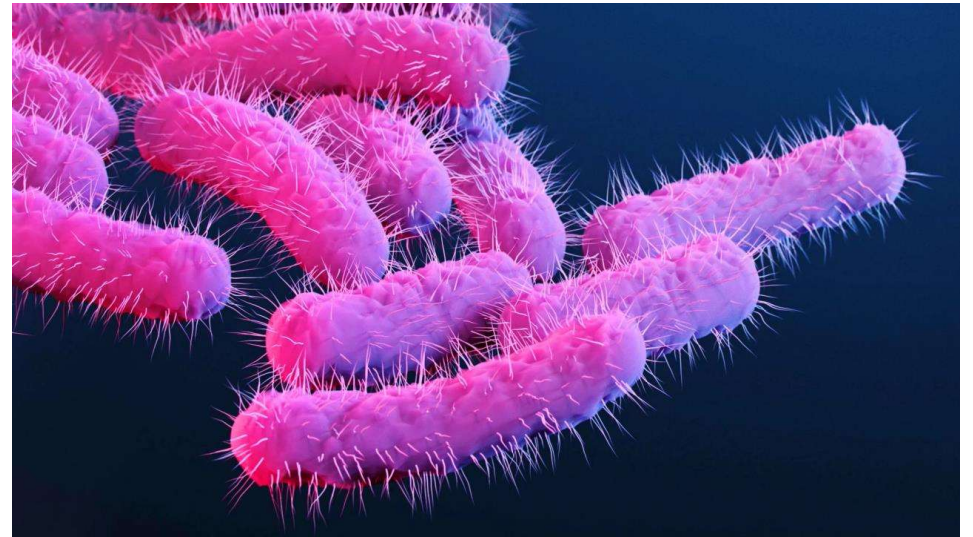


SHIGELLOSIS

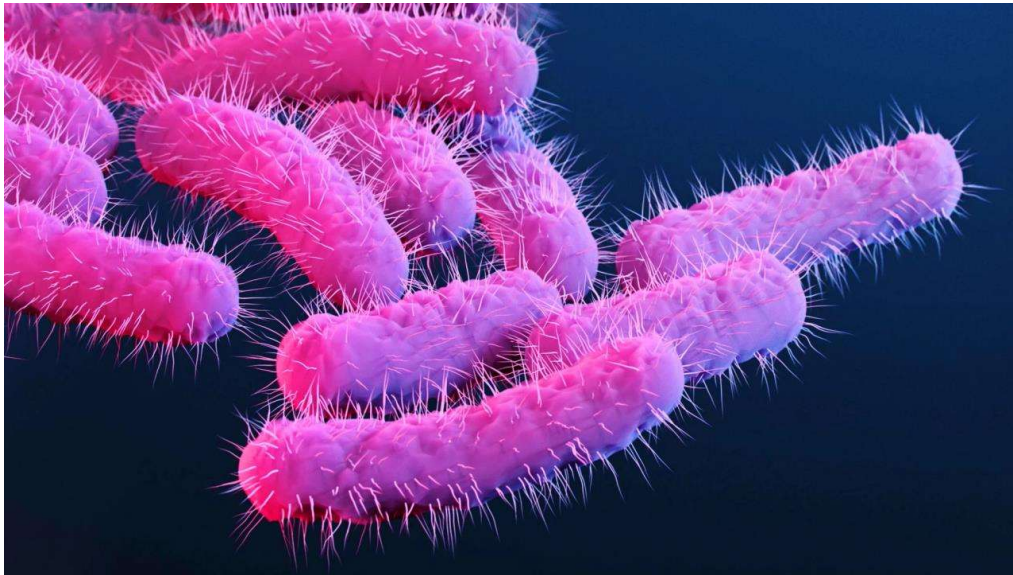
Common waterborne gastrointestinal illness caused by ingested bacteria

Shigella is found in fecal matter and is transferred through the fecal-oral route

Signs and symptoms may include diarrhea that contains mucus and/or blood, stomach pain or cramps, nausea or vomiting



SHIGELLOSIS MANAGEMENT & PREVENTION



Certified Pool Operators should maintain chlorine levels in aquatic venues

Bathers should wash hands often with soap and water after using the restroom, after changing diapers, before and after caring for someone that is sick

GIARDIASIS

Caused by parasite *Giardia*

An infectious disease of the intestinal tract

Symptoms: diarrhea, greasy stool, stomach cramps, nausea, and dehydration

Transmission: Fecal-oral route; ingestion of *Giardia* parasite cysts

Can survive up to 45 minutes in a properly chlorinated pool

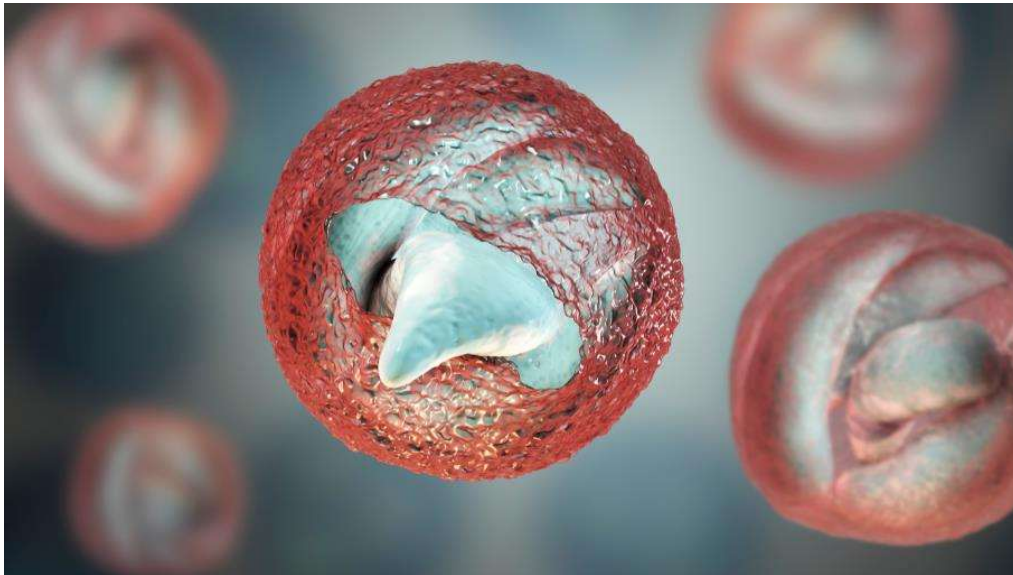


GIARDIASIS MANAGEMENT & PREVENTION

- Ensure proper disinfectant and pH levels
- Don't swim with diarrhea
- Don't poop in water
- Don't swallow pool water
- Take kids on bathroom breaks/checks every hour



CRYPTOSPORIDIOSIS



Common waterborne gastrointestinal illness caused by ingested cryptosporidium oocysts and shed through fecal matter

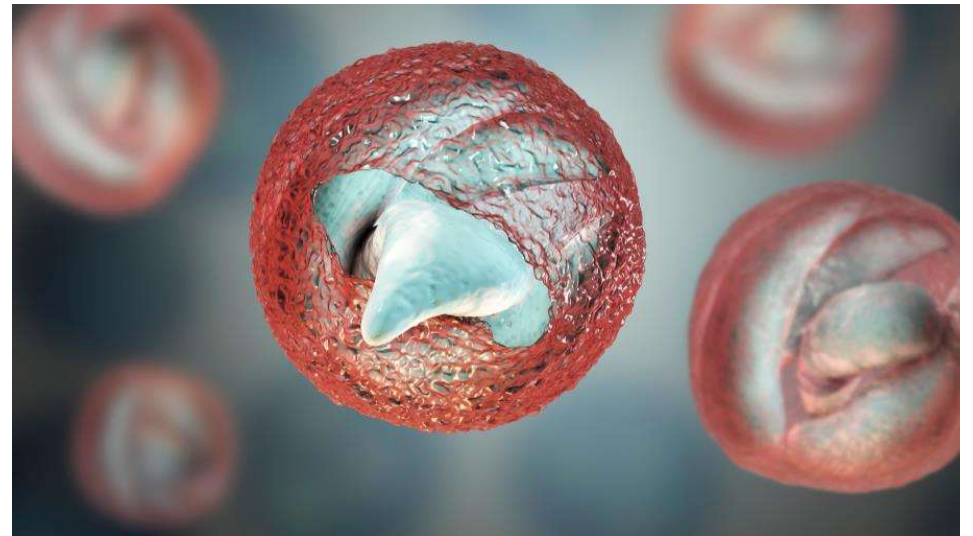
Cryptosporidium can survive for up to 10.5 days in treated water of 1.0 – 3.0 PPM Cl and pH of 7.2 – 7.8

The ingested protozoan is most likely to cause diarrhea, but may also cause abdominal pain, fever, nausea, vomiting, and weight loss

CRYPTOSPORIDIOSIS MANAGEMENT & PREVENTION

Certified Pool Operators should monitor and maintain proper chlorine and pH levels

Persons with diarrhea or recent diarrheal infection should not swim for one week after symptom resolution





RWI CONTAMINATION RESPONSE

1. Immediately close aquatic venue to swimmers

2. Use gloves to remove fecal matter using a net or bucket. DO NOT vacuum the fecal matter from the pool

3. Raise the free chlorine concentration and maintain pH at 7.5

4. Confirm that the filtration system is working properly

<https://www.cdc.gov/healthy-swimming/response/what-to-do-when-there-is-poop-in-the-pool.html>

HYGIENE SIGNAGE

Bather hygiene is important for the prevention of RWI and contamination events that lead to pool closures

Showering before swimming eliminates traces of sweat, body oils, cosmetics, and fecal matter.

- Bathers shed an average of 0.14 g of fecal material when swimming

This part of bather hygiene is crucial to reduce risk of exposure to microbiological and chemical hazards in public bathing places



RECREATIONAL WATER ILLNESS

- RWIs are illnesses that are spread by swallowing, breathing or having contact with contaminated water from swimming pools, spas, lakes, rivers or oceans (SNHD website)
 - The most common RWI according to SNHD (2018) are Cryptosporidium, Giardia, Shigella, and E. coli 0157:H7
- RWI complaints are extremely rare
- Aquatics gets a report from EPI
 - Handled similarly as a regular complaint
- Check water chemistry, chemical logs, and contamination logs
- If warranted, Inspector will request the facility to get a biological sample of water tested with a state certified lab and follow up with results.

REPORTING RECREATIONAL WATER ILLNESSES

The screenshot shows the Southern Nevada Health District (SNHD) website. The header includes social media icons, contact information (Call us at (702) 759-1000, snhdpublicinformation@snhd.org), COVID-19 status, and a language selector. The main navigation bar lists CLINICS, PROGRAMS, PERMITS & REGULATIONS, A TO Z, NEWS & INFORMATION, ABOUT US, and LOCATIONS. A search bar is located below the navigation bar. The breadcrumb trail reads: Home / Environmental Health – Online Complaint Submission Form: English. The main content area features a green leaf icon and the text "Environmental Health – Online Complaint Submission Form: English". Below this, it says "Click [here](#) to report foodborne illness or food poisoning." At the bottom right, there is a button labeled "EN ESPAÑOL".

Call us at (702) 759-1000 snhdpublicinformation@snhd.org COVID-19 LANGUAGE

SNHD
Southern Nevada Health District

CLINICS PROGRAMS PERMITS & REGULATIONS A TO Z NEWS & INFORMATION ABOUT US LOCATIONS

Home / Environmental Health – Online Complaint Submission Form: English

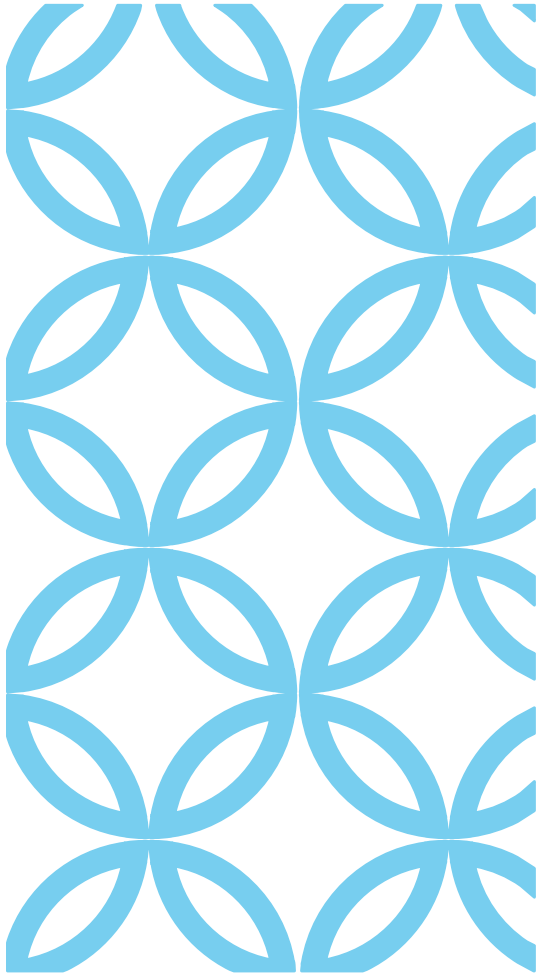
[Environmental Health - Online Complaint Submission Form: English](#)

Salud Ambiental – Formulario Para Enviar Quejas en Líneas: En Español

Environmental Health – Online Complaint Submission Form: English

Click [here](#) to report foodborne illness or food poisoning.

EN ESPAÑOL



When an Aquatic Venue gets alerted of a potential RWI at a facility

Step 1: Inspectors partner up and one does a routine inspection and the other does the RWI investigation.

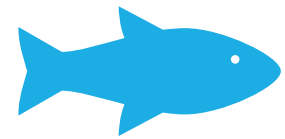
A) The inspector that is handling the RWI investigation will check the water chemicals and the facility will be required to obtain a water sample and send it to a certified lab to test if the RWI is present in the sample. This test might require to check if E. Coli; Coliforms, or other bacteria are present.

B) If the water sample is positive, then the facility will proceed with the CDC Incident Response Recommendation steps to sanitize and eliminate the RWI.

Step 2: The other inspector will conduct a normal routine inspection

FOLLOW UP FOR RWI COMPLAINT

EPI & AQUATIC HEALTH COLLABORATION



RESORTS

&

DAYCLUBS

-Collaborations can occur between Programs (including but not limited to):

SNHD Epidemiology/ Disease Reporting

SNHD Food Establishment Operations

SNHD Aquatic Health Operations

TASKS:

SNHD Food Establishment Operations – Suspected food borne illness outbreak, Sanitary conditions, handwashing, waste management, and personal hygiene procedures

SNHD Aquatic Health Operations – Disinfection and circulation system maintenance, water chemistry, third party water sample tests from facility

SNHD Epidemiology/ Disease Reporting- Lab confirmed cases, change in disinfectant, vendors, manufacturers, and personal hygiene procedures, Third party water sample

GOALS:

-Investigate prevalence of recreational water illness and/or foodborne illness that may occur in shared spaces (dayclubs, resorts, water parks, etc.)

-Collaborate with facilities to educate and eliminate occurrence of food borne illness and/or recreational water illnesses

QUESTIONS?

