



## **If the air smells like chlorine, something is wrong**

Pool operators may receive complaints from swimmers and pool staff about stinging eyes, nasal irritation, or difficulty breathing after being in the water or breathing the air at swimming pools, particularly indoor pools. New research indicates that these symptoms may be an indication of poor water and indoor air quality at the pool caused by a build-up of irritants.

***The acrid smell we sometimes associate with chlorine is usually an ammonia type compound. The cause of this odor is “chloramines”, the odor is created when water is not properly balanced and the chloramines exceed a certain level.***

Irritants in the air at swimming pools are usually the combined chlorine by-products of disinfection. These by-products are the result of chlorine binding with perspiration (sweat), dander, urine, saliva, body oils, lotions and some shampoos/soaps and other waste from swimmers. As the concentration of by-products in the water increases, they move into the surrounding air as well. Breathing air loaded with irritants can cause a variety of symptoms depending on the concentration of irritants in the air and amount of time the air is breathed. The symptoms of irritant exposure in the air can range from mild symptoms, such as coughing, to severe symptoms, such as wheezing or aggravating asthma.



The buildup of these irritants in the air is partially due to poor air turnover. The odor intensifies when swimmers agitate the water, as in kicking or general warm-up swimming. The odor is worse at water level but can be extremely irritating at deck level or in the viewing area. Many times eye irritation and breathing difficulties are also experienced.

The problem of poor indoor air quality can be fixed through a combination of preventive measures. Improving air movement over the pool and increasing the air turnover rate will reduce irritant levels in the air. One option is to open all of the doors and windows in the pool area or to use fans to boost airflow over the pool surface when many swimmers are using the pool. Adequate disinfectant levels and constant monitoring of water quality can also help reduce irritant levels by decreasing combined chlorine formation in the water. In addition, good hygiene is needed. Getting swimmers to shower before getting in the pool will decrease the formation of irritants.

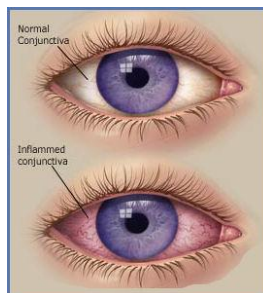
## What can I do to help

**Always shower before entering, and don't urinate in pools & spas.** What has come to the forefront recently is that urinating in the pool may be one of the main causes for "bad air quality" in indoor pools. Since urine has high ammonia content, a few people urinating in a 25 yard pool can tremendously affect the chloramines level. This directly affects the air quality in the pool area.



## Pool Rashes

Problems with pool rashes and irritations fall into several categories. Some are bacterial infections caused by inadequate pool water sanitizing, water trapped in the ear or remaining in a damp bathing suit for prolonged periods of time. Some chlorine byproducts such as chloramines are irritating and can lead to problems. Some individuals are highly sensitive to certain chemicals or materials and can experience problems, even though the pool is being properly maintained. When the water chemistry and/or sanitizer level is grossly out of balance, a chemical dermatitis can be the result. All instances of a rash or irritation should be evaluated by a medical doctor. **Individuals, sensitive to even normal levels of common sanitizers, may be helped by a switch to an alternative sanitizing method.**



## Eye Irritation

Eye irritation due to swimming, or chemical conjunctivitis, is a common problem experienced by those who swim in chlorinated pools. Caused by irritants such as chlorine, air pollution or chemical exposure, chemical conjunctivitis is an inflammation of the conjunctiva, the thin layer of transparent tissue that covers the white of the eye. According to the Centers for Disease Control and Prevention, or CDC, pool water pH levels that are too high or too low can also be the source of eye irritation. Those who are prone to developing eye discomfort after swimming may find relief in using protective eyewear during visits to the pool.

## Symptoms

People who experience chemical conjunctivitis from swimming may display symptoms in one or both eyes. These symptoms can be manifested as a gritty sensation, itching, burning and excessive eye watering. Discharge from one or both eyes is a common symptom, as are swollen eyelids, eye redness, light sensitivity and blurred vision.

## Self-Care

According to the American Optometric Association, flushing the eyes thoroughly with warm water or saline solution can help remove irritants from the surface of the eye, relieving chemical conjunctivitis. Cold compresses can combat inflammation and irritation, and over-the-counter lubricating eye drops can ease itching and burning. Contact lens wearers may need to discontinue the use of their lenses until the eye inflammation and irritation is alleviated.



## When to See the Eye Doctor

Eye irritation that persists for more than a few hours after swimming or does not respond to self-care measures should be evaluated by an eye care professional. See your eye doctor if thick, pus-like discharge is present. Chlorine irritation can result in the temporary clouding of vision, but consult your eye doctor if vision changes persist for more than an hour or two, as this can indicate more serious complications. According to the Mayo Clinic, conjunctivitis can, in extreme cases, cause inflammation in the cornea that can cause vision changes.

## Prevention

Testing the water's pH frequently and adjusting pool chemicals accordingly can help prevent eye irritation. According to the CDC, a pH level between 7.2 and 7.8 is ideal for eye comfort and pool disinfection. However, maintaining this ideal pH level can be a challenge in a public pool, chemical and pH levels are beyond the control of visitors. Swimming goggles can be a good alternative, as they protect against eye irritation by providing a watertight physical barrier between sensitive eye tissues and pool water.

This information is provided to you by the IES Safety Committee