

COMMON HEALTH QUESTIONS RELATED TO MONOCHLORAMINE

25) Do chloramines cause breathing problems?

EPA believes that water disinfected with [monochloramine](#) that meets regulatory standards has no known or anticipated adverse health effects, including breathing problems.

- Monochloramine does not enter the air easily and therefore would be difficult to inhale.
- CDC's investigation¹ of reports of monochloramine-related breathing problems associated with drinking water use was unable to draw any conclusions about monochloramine use and health effects.
- Breathing problems associated with trichloramine and indoor swimming pools have been reported.²

Trichloramine³, a chemical related to monochloramine and often found in swimming pools, has been linked to breathing problems.

- Trichloramine forms in swimming pools when chlorine reacts with ammonia from bodily fluids.
- Breathing problems traceable to disinfected water are typically related to swimming pool use.⁴
- EPA continues to review research related to the use of disinfectants used in swimming pools.

People who believe their breathing problems are related to [monochloramine](#) should consult with their doctors.

- The causes of breathing problems are often difficult to determine.
- People who have breathing problems should inform their doctors if they have spent time in or around a swimming pool recently.
- CDC's investigation¹ of reports of monochloramine-related breathing problems associated with drinking water use was unable to draw any conclusions about monochloramine and health effects.

Additional Supporting Information:

1. CDC and EPA conducted a preliminary investigation of reports of monochloramine-related respiratory problems associated with drinking water. The investigation consisted of a questionnaire filled out by complainants. The information collected could be used to help design future epidemiologic studies.

CDC's trip report can be found at:

http://healthvermont.gov/enviro/water/documents/CDC_Chloramines_report_011608.pdf.

2. Reported breathing problems due to chloramines are primarily related to inhalation of household chemicals (mixing ammonia and bleach cleaning products), indoor swimming pool air, or industrial exposure. See question 1 for further information about different types of chloramines.

3. Trichloramine formation does not usually occur under normal drinking water treatment conditions. However, if the pH is lowered below 4.4 or the chlorine to ammonia-nitrogen ratio becomes greater than 7.6:1, then trichloramine can form. Trichloramine formation can occur at a pH between 7 and 8 if the chloramine to ammonia-nitrogen ratio is increased to 15:1. Source: *Optimizing Chloramine Treatment*, 2nd Edition, AwwaRF, 2004.

4. Improper pool maintenance can often lead to trichloramine formation: Some examples include: www.cdc.gov/niosh/hhe/reports/pdfs/2007-0163-3062.pdf and www.cdc.gov/mmwr/PDF/wk/mm5636.pdf.