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Andrea Salzman, MS, PT
Founder

What is Team Aquatic Therapy?

The Aquatic Resources Network (ARN) was founded in 1995–96 when a handful of my students started asking questions about aquatic exercise. At that time, clinicians were struggling to find a credible, international clearinghouse of information devoted solely to aquatic therapy. There was a real need to connect students and clinicians, companies and consumers. Today, I'm proud to say, we have grown from our original 30 charter members to thousands of therapists across the world. So join our members, known as Team Aquatic Therapy, and share your love of aquatic therapy with PTs, OTs, CTRSs, ATCs, exercise physiologists, kinesiologists, massage therapists …. and the world! Stop re-creating the wheel. We can help you be a success at what you love the most. We are your Aquatic Therapy Command Center.

Andrea Salzman, MS, PT

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Occupational Risks for Aquatic Staff: Contact Dermatitis and Occupational Asthma
Relevant Research Abstracts

Pardo A, Nevo K, Vigiser D, Lazarov A. The effect of physical and chemical properties of swimming pool water and its close environment on the development of contact dermatitis in hydrotherapists. Am J Ind Med. 2007 Feb;50(2):122-6.	BACKGROUND: The association between physical and chemical parameters in swimming pool water and the incidence of contact dermatitis (CD) in hydrotherapists was studied. METHODS: Chemical and physical parameters characterizing the water and air environment of swimming pools conducting hydrotherapy program were recorded. Differences between the values of these parameters associated with affected and non-affected hydrotherapists employed in 39 pools were tested statistically. RESULTS: No significant difference was found between the means of each of the physical and chemical parameters associated with the affected and the non-affected group of hydrotherapists. The prevalence ratio of the incidence of CD in pools chlorinated by gaseous chlorine was significantly higher than that in pools disinfected by other forms of chlorine compounds (PR = 1.49, CI = 1.17-1.89, P = 0.017). CONCLUSIONS: Dosing the water with larger amounts of gaseous chlorine compared to other disinfectants and a subsequent temporary decrease in the pH of the water may produce a more aggressive environment. It is suggested that combined effect of the various factors concomitantly with the irritating effect of prolonged exposure to water may trigger CD in pools treated with other chlorine-based compounds.
Lazarov A, Nevo K, Pardo A, Froom P. Self-reported skin disease in hydrotherapists working in swimming	The aim of our study was to investigate the risk and characteristics of self-reported skin diseases among hydrotherapists. We

pools. Contact Dermatitis. 2005 Dec;53(6):327-31.	attempted to contact 400 adults who participated in 1 of 2 training courses. 248 were reached and 190 of them (76.6%) completed the questionnaires. The data were collected by means of a telephone interview and a detailed questionnaire sent by mail. Statistical analysis included descriptive statistics, univariate and multifactorial analysis. Of those completing the questionnaire (75.8% females and 24.2% males), 44.4% of the hydrotherapists reported on the development of skin disease for the first time after the beginning of work at the swimming pool. The most common symptoms included pruritus and erythematous patches affecting mainly the extremities and trunk. Both smoking and increased exposure hours to pool water were independently associated with skin disease, suggesting a dose-response relationship. We conclude that contact dermatitis should be recognized as an occupational disease in hydrotherapists.
Jacobs JH, Spaan S, van Rooy GB, Meliefste C, Zaat VA, Rooyackers JM, Heederik D. Exposure to trichloramine and respiratory symptoms in indoor swimming pool workers. Eur Respir J. 2007 Apr;29(4):690-8. Epub 2006 Nov 15.	The association between swimming pool characteristics and activities of employees and respiratory symptoms in employees was studied. Trichloramine levels were measured to evaluate relationships with pool characteristics and to estimate long-term exposure levels. Questionnaires were available from 624 pool workers and 38 swimming facilities. Chloramine levels were measured by area sampling over 2-h periods and analysed using ion chromatography. Work-related and general respiratory symptoms, and symptoms indicative of atopy and bronchial hyperresponsiveness were considered. Respiratory symptom prevalence among pool workers was compared with symptoms in a Dutch population sample. Chloramine levels were modelled with regression analysis. This model was used to estimate long-term average chloramine

	levels for each pool studied.
Thickett KM, McCoach JS, Gerber JM, Sadhra S, Burge PS. Occupational asthma caused by chloramines in indoor swimming-pool air. Eur Respir J. 2002 May;19(5):827-32.	The first series of three workers who developed occupational asthma following exposure to airborne chloramines in indoor chlorinated swimming pools is reported. Health problems of swimmers in indoor pools have traditionally been attributed to the chlorine in the water. Chlorine reacts with bodily proteins to form chloramines; the most volatile and prevalent in the air above swimming pools is nitrogen trichloride. Two lifeguards and one swimming teacher with symptoms suggestive of occupational asthma kept 2-hourly measurements of peak expiratory flow at home and at work, analysed using the occupational asthma system (OASYS) plotter, and/or had specific bronchial challenge testing to nitrogen trichloride, or a workplace challenge. Air measurement in one of the pools showed the nitrogen trichloride levels to be 0.1-0.57 mg x m(-3), which was similar to other studies. Two workers had peak expiratory flow measurements showing occupational asthma (OASYS-2 scores 2.88 and 3.8), both had a positive specific challenge to nitrogen trichloride at 0.5 mg x m(-3) with negative challenges to chlorine released from sodium hypochlorite. The third worker had a positive workplace challenge. Swimming-pool asthma due to airborne nitrogen trichloride can occur in workers who do not enter the water because of this chloramine. The air above indoor swimming pools therefore needs to be assessed and managed as carefully as the water.
P T Penny. Hydrotherapy pools of the future--the avoidance of health problems. J Hosp Infect. 1991 Jun ;18 Suppl A:535-42 1679828 (P,S,E,B)	The need to minimize the threat of infection to patients and the high incidence of health problems in hydrotherapy pool workers, have led to recommendations especially tailored to the design and operation of the water and air treatment

	plant of hydrotherapy pools. Hitherto unpublished surveys are detailed which confirm that pathogenic species of Pseudomonas aeruginosa in pools (in which ears may be wetted) cause a high incidence of otitis externa, but rarely cause body rashes (pseudomonas folliculitis) unless there has also been prolonged skin wetting. In brominated pools contact dermatitis is common and can be distinguished clinically from pseudomonas folliculitis by the onset of a pruritic rash less than 12 hours after exposure to the pool and reactivation of the rash on re-exposure to the brominated pool.

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Rashes Associated with Exposure to Aquatic Venues

Roy D. Vore, Ph.D., DuPont Chemical Solutions Enterprise

Skin rashes are an all too frequent consequence of exposure to poorly managed water. Disinfection byproducts can induce rapid and clinically significant dermal reactions in some individuals. The best documented cases of this type of contact dermatitis are among

health professionals working in aquatic therapy tanks. Less documented cases are noted among life guards and the general public.

Microbial dermal infections have longer incubation periods than chemical allergic reactions. Pseudomonas aeruginosa is the most frequently reported bacterial infection in all aquatic venues. Inflammation of hair follicles (folliculitis) is the most common complaint resulting from contact with P aeruginosa. Victims and occasionally medical professionals describe this rash as a “burn” or “chemical burn”. Documented cases of swimmer’s ear and infections of the respiratory tract, urinary tract, wounds and cornea caused by P aeruginosa have been linked to the use of hot tubs. Informal surveys of frequent recreational water users indicate that infections caused by this bacterium are very widespread and may repeatedly attack some individuals.

Prior to the mid 1980’s and the advent of the portable modern spa most microbiologists focused on Staphylococcus aureus as the primary cause of rashes from aquatic venues. An outbreak in 2003 among collegiate athletes in Connecticut and the increase in community acquired Methicillin-resistant Staph aureus (ca-MRSA) may be heralding the emergence of a new and more serious bacterial rash agent.

Less understood and poorly reported is the role that viruses play in recreational water rashes. While chemically induced dermatitis and P aeruginosa rashes are not serious health threats, their wide spread occurrence is a strong indication that poor water quality is common and pervasive. Continuous adequate sanitizer residuals in the water coupled with routine oxidation is critical in managing water quality, and limiting the potential for rash outbreaks. This presentation will focus on how and why the mismanagement of aquatic venues can lead to dermal infections and contact dermatitis. Case studies will be used to illustrate the mechanism of outbreaks.

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