

Direct from CDC's
Environmental
Health Services
Branch

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Recreational Water Illness Prevention and Swimming Pool Operation: Moving Beyond the Basics

Editor's note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we will feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the Journal.

EHSB's objective is to strengthen the role of state, local, and national environmental health programs and professionals to anticipate, identify, and respond to adverse environmental exposures and the consequences of these exposures for human health. The services being developed through EHSB include access to topical, relevant, and scientific information; consultation; and assistance to environmental health specialists, sanitarians, and environmental health professionals and practitioners.

EHSB appreciates NEHA's invitation to provide monthly columns for the Journal. EHSB staff will be highlighting a variety of concerns, opportunities, challenges, and successes that we all share in environmental public health.

The 2007 swim season opens this Memorial Day weekend. Millions of people of all ages will flock to the nation's swimming pools to take part in one of the country's favorite pastimes. Unfortunately, the association of swimming with recreational-water illnesses (RWIs) is well documented and was underscored during the 2006 swim season. At least nine cryptosporidiosis outbreaks occurred, in addition to outbreaks caused by *Legionella*, *Giardia*, *Shigella*, *Pseudomonas*, and norovirus. Multiple factors have played roles in facilitating RWI transmission. The tremendous growth in aquatics is highlighted by the number of waterparks in North America, now over 1,000, with attendance exceeding 73 million in 2004. Contamination of pool water is common because of misconceptions about pool water treatment that result in practices such as 1) swimming while ill with diarrhea, 2) swallowing pool water, and 3) poor hygiene. Pool operation is still critical to stopping outbreaks of chlorine-sensitive pathogens such as *Shigella*, *Giardia*, and norovirus. The chlorine-resistant parasite *Cryptosporidium*, however, has emerged as the leading cause of recreational water-associated outbreaks of diarrhea. Since 1988, 124 outbreaks of cryptosporidiosis have occurred worldwide.

Mandated water quality requirements are still premised on the assumption that appropriate filtration and residual halogen disinfection will inactivate all pathogens. The emergence of *Cryptosporidium* necessitates a para-

digim shift; the task of protecting swimmers will require that public health practice move beyond the basics of existing pool operation. The paradigm for the 21st century will address future challenges through a synthesis of three approaches: 1) involvement of the general public; 2) technological, operational, and educational improvements; and 3) improved outbreak investigations that supply data for prevention efforts.

The public must be brought back into the equation. Raising awareness about RWI prevention issues, supplying information and education, and imparting an understanding of the importance of pool programs are all imperative if we are to transform the swimming public into informed advocates for improved water quality. The intent of National RWI Prevention Week (May 21–27, 2007) is to provide a time in which to highlight these issues to the general public. During this week, public health programs can emphasize the need for swimmers to improve hygiene, swallow less pool water, and stop swimming when ill with diarrhea (www.cdc.gov/healthyswimming/rwi_prevention_week.htm).

Programs need to focus on technological and operational methods of improving water quality. Supplemental, in-line disinfection known to inactivate *Cryptosporidium* (e.g., UV, ozone) will become the third pillar of pool operation at all facilities, in addition to filtration and residual halogen disinfection. The way to this goal will be through promotion of uniform national pool standards. A partnership of CDC, the New York State Department of Health, and

the National Spa and Pool Foundation is beginning an effort to develop a model national aquatic health code. Public health and industry representatives from across the country will be developing a data-driven, risk-based code for voluntary use by health officials. The model code will include a mechanism for regular input and updates so that it will stay current with new developments. Critical to this effort will be 1) optimized designs; 2) enhanced water treatment (e.g., disinfection, filtration, flocculation); 3) improved training for all pool operators, aquatics staff, and pool inspectors; 4) regular water quality monitoring; 5) routine equipment checks and preventive-maintenance programs; 6) creation of improved operational and employee management policies; 7) risk-based pool inspections yielding data for program decision making; and 8) improved patron education and pool use policies.

Improvements in the detection, investigation, and reporting of waterborne-disease outbreaks are needed for a better understanding of system failures that lead to RWI outbreaks. These improvements, which will

yield the foundation-building data needed for development of a model aquatic health code, are called for in a position statement issued in 2006 by the Council of State and Territorial Epidemiologists (CSTE). The position statement also requested that 1) waterborne-disease outbreaks be made nationally reportable, 2) national guidelines be developed for the investigation and surveillance of waterborne-disease outbreaks, and 3) improved investigation training materials be targeted to state and local public and environmental health workers. The use of such training materials for environmental investigations will facilitate collection of information key to identifying common outbreak themes (e.g., key equipment failures), a step that is essential for prevention plan development.

The complex, multifaceted nature of the RWI problem ensures that there will be no simple solutions for the 21st century. We can be sure, however, that existing practices must change if they are to continue protecting swimmers. The future will require that we 1) build an RWI prevention program to

educate state and local legislators, boards of health, and the general public about the need for strengthened oversight, regulation, and enforcement of aquatic health codes; 2) that we make technological, operational, and educational improvements; and 3) that we train staff for rapid detection, investigation, and reporting of waterborne outbreaks. Health departments have extensive responsibilities that make it difficult to start new programs. Planning some simple activities for National RWI Prevention Week can, however, serve as the first small step on the long road to development of an RWI prevention plan. For further information on National RWI Prevention Week and swimmer health, visit www.cdc.gov/healthyswimming. 🐬

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