# LIFEGUARD INJURIES AND SAFETY BULLETIN

**Introduction**

Lifeguards supervise and ensure the safety of swimmers, surfers, and other water sports participants in swimming pools, water parks, and beaches. They rescue swimmers and patrons (i.e. non-swimmers in medical distress) as required, render first aid and may function as the primary EMS provider. In 2014, lifeguards in the United States ("U.S.") made 90,972 rescues. They may also teach a variety of aquatics courses. Facility maintenance is often part of the lifeguard duties. There are four primary types of lifeguard certification: pool, surf, waterpark, and waterfront.

A number of organizations train lifeguards in Canada. These include the Red Cross, the Lifesaving Society, and the YMCA. In the Lifesaving Society, the National Lifeguard Service (NLS) certification is the industry standard for professional lifeguards in Canada. NLS guards are trained in emergency care. Usually, lifeguards will require National Lifeguard certification, C.P.R Basic Rescuer certification, First Aid certificate (Aquatic Emergency Care, Standard First Aid, Occupational First Aid Level 2 or 3), Red Cross Water Safety Instructor Level I and II, and NLS Pool and / or Waterfront options. If working at a YMCA, the lifeguard may be required to have YMCA Swim Instructor or equivalent and YMCA Aquatic Fitness Certificate.

**Injury Statistics**

Injuries arise from rescues, teaching / instruction, training, recertification, competitions, and occupational exposures to sun, chemicals, biological agents, and noise over short and long term durations.

There are between 80 and 100 time-loss injury claims each year in BC. WorkSafeBC does not keep statistics on medical claims (health care versus actual time loss) therefore the true number of work related injuries is not known.[1] Fatalities are rare, with eight being recorded in the U.S. from 2003 to 2013. In the U.S., the injury data for this sector is combined with the ski industry and other occupations.

Acute muscle strains and sprains are the most common injuries seen in lifeguards in the U.S. with over 44% of lifeguards sustaining this type of injury. Other common injuries and repetitive strain injuries ("RSIs") include lacerations to the feet, "swimmer's shoulder" (rotator cuff tendonitis and bursitis), bicipital tendinitis, acromioclavicular joint sprain, "lifeguard's calf" (stress and inflammation of the dorsi and plantar flexors of the foot and ankle), "Jumper's Knee, "patellar tendinitis, shin splints, stress fractures, iliotibial band syndrome and plantar fasciitis. As per Wernicke (no date), "A survey in 1989 showed 79% of lifeguards [U.S.] had suffered some type of foot trauma".

[1] It is estimated that only 40% of all injuries, for all occupations, are reported to WorkSafeBC.

Lifeguards have an increased prevalence of skin cancer (keratoses, basal cell, squamous cell and malignant melanomas) where they have predominantly worked outside. Between 63–88% of lifeguards in the U.S. regularly received ultraviolet radiation ("UVR") exposures in excess of the occupational UVR TLVs (depending upon the location). Over 50% of lifeguards in the U.S. had a history of severe sunburns.

Lifeguards have an increased prevalence of respiratory conditions where prolonged employment at inside (enclosed) pools has occurred. In one study 38.5% were classified as having MBC+ (methacholine bronchial challenge indicating risk of onset of asthma or presence of asthma).

Eye diseases and injuries are common, including pingueculae, pterygia, ocular sunburn and cataracts.

Exposure to hepatitis, HIV and other communicable diseases is potentially higher, though no statistics were found establishing increased exposure rates or occupational disease.

Finally, contact dermatitis was more common in lifeguards than the general population due to exposure to disinfection by-products.

**Risk Factors**

Nearly 50% all aquatic staff are under the age of 22. There are more women than men in this sector. Many employees are temporary or auxiliary. Women incur 70% of the injuries, recognizing that the sector is primarily composed of women. Risk factors cause short term and long term harm. For example, there is some evidence that exposure to chloramines, particularly trichloramine, may cause occupational asthma. Trichloramine can significantly decrease lung function.

Specific work place hazards include:

- Chemicals and substances (in gaseous, liquid or solid form) such as ozone, chlorine, pool brighteners, diatomaceous earth, testing chemicals, soda ash, bromine, muriatic acid, hypochlorites, trihalomethanes, etc
- Organic substances and micro-organisms such as protozoa, bacteria, fungi, viruses and amoebae
- Biohazards such as blood, vomit, urine, feces, etc
- Heat stress, including heat exhaustion and sun stroke
- Assaults by patrons
- Musculoskeletal hazards ("MSIs") caused by slips, trips, falls, lifting, sitting for lengthy periods of time, moving lane ropes/bulkheads, lifting clients (children, disabled), lifting chemical containers
- Noise

- Poor air quality
- Confined spaces (which were responsible in whole or in part for the two fatalities in BC that have occurred)
- Fatigue due to long hours, split shifts, working at multiple pools, etc

**Prevention**

Specific recommendations for workplaces include:

- Have an Emergency Response Plan for the worksite
- Conduct Emergency Drills regularly
- Ensure all relevant Materials Safety Data Sheets are up to date and available
- Ensure all required personal protective equipment is available including eye protection, skin protection, foot protection and respirators
- Have a Chlorine Exposure Control Plan
- Conduct a Risk Assessment for Hazardous Substances
- Conduct a Check-In Assessment for Working Alone
- Have a Working Alone Policy
- Conduct a Violence Risk Assessment
- Have a Sun Safety and Workplace Protection Plan
- Provide appropriate eye protection against the sun and wind
- Take noise level sampling wherever a worker is exposed or might be exposed to noise levels above 82 decibels
- Have a Heat Stress Exposure Control Plan
- Have lockout procedures for equipment
- Have proper ventilation
- Have good water chemistry
- Have appropriate chlorine levels
- Have adequate water turnover
- Humidity should be kept between 50% and 60% in indoor pools
- Air temperature should be kept at 1 or 2 degrees above the indoor pool temperature

**Conclusion**

There is a lack of government (including WorkSafeBC) data on health care only claims, injury claims that result in time loss, occupational exposure claims and the various types of injuries lifeguards experience. There is no data differentiating injuries in private facilities versus public facilities, pools versus waterfronts, etc. Finally, with the increasing number of red tides and algae blooms, there are increased risks for microbial infections. Further data collection and analysis by WorkSafeBC and other agencies needs to occur.

**Glossary of Terms**

Chloramines – the byproduct of a reaction between chlorine and nitrogenous material (sweat and urine)

Endotoxin- lipopolysaccharides in the walls of gram-negative bacteria that have the potential to cause toxicity

Granulomatous pneumonitis – alveoli inflammation within the lung and subsequent formation of granulomas (macrophages)

Hypersensitivity pneumonitis – general alveoli inflammation within the lung

Nontuberculous Mycobacteria – environmental bacteria that is casually linked with lifeguard lung

Occupational lifeguard lung – granulomatous/hypersensitivity pneumonitis

Trichloramine – a volatile chloramine, most likely to vaporize out (remove) of all chloramines in pool water

**Resources and Sources**

See the CUPE BC OH&S website for numerous Power Points, Guides and Templates on filing WCB claims or appeals for claims that involve the injuries and conditions mentioned in this Bulletin.

American Lifeguard Association http://www.americanlifeguard.com/cprfirstaid.htm

"A Primer for Young Worker Safety and Health Training" Center for Young Worker Safety and Health

"Association between outdoor ozone and compensated acute respiratory diseases among workers in Quebec (Canada)" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4380604/

BC Pool Regulation 296/2010(2011) http://www.bclegislation.ca/2012/08/20/bc-pool-regulation-2962010-2/

BC Guidelines for Swimming Pool Operation
http://www.bcrpa.bc.ca/recreation_parks/aquatics/documents/bc-pool-operations-guidelinesFINAL.pdf

"Body contact swimming rescues--what are the risks?"
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1619051/

Bureau of Labour Statistics http://www.bls.gov/oes/current/oes339092.htm

Canadian Red Cross http://www.redcross.ca/training-and-certification/course-descriptions/swimming-and-water-safety-courses/swimming-and-water-safety-professional-development-opportunities

"Changes in Work Habits of Lifeguards in Relation to Florida Red Tide" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2850072/

Chloramines Safe Work Practices http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/bk147.pdf?_ga=1.225610586.1707185010.1440539318

"Exhaled nitric oxide and airway hyperresponsiveness in workers: a preliminary study in lifeguards" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2805603/

"How Loud Is It?" WorkSafeBC http://www2.worksafebc.com/pdfs/hearing/How_Loud_Series/municipality.pdf?_ga=1.148475767.1707185010.1440539318

"Hot tub lung: Presenting features and clinical course of 21 patients" http://www.resmedjournal.com/article/S0954-6111(05)00328-8/abstract?cc=y=

International Lifesaving Federation http://www.ilsf.org/drowning-prevention/library/swimming-pool-injury-data-improvements-lifeguard-training

"Lifeguarding" (list of all occupational diseases and injuries common to the sector) www.sportsci.org/encyc/drafts/Lifeguarding.doc

"Lifeguard Lung & BC Public Pools: Synthesizing Research, Policy and Risk Assessment Methods to Protect and Prevent Granulomatous Pneumonitis" http://www.cupe.bc.ca/sites/default/files/Lifeguard%20Lung%20and%20BC%20Public%20Pools%20Report%20-%20SFU%20%20December%202012.pdf

"'Lifeguard lung'": endemic granulomatous pneumonitis in an indoor swimming pool http://www.ncbi.nlm.nih.gov/pmc/articles/PMC492441/#r25

"Lifeguards' Sun Protection Habits and Sunburns" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2928139/

Lifesaving Society http://www.lifesavingsociety.com/lifeguarding.aspx

Lifesaving Society Standards Journal http://www.lifesaving.org/download/STND-JRNL2012-web.pdf

"Measured Occupational Solar UVR Exposures of Lifeguards in Pool Settings" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3728671/

National Institute for Occupational Safety and Health http://www.cdc.gov/niosh/docs/wp-solutions/2010-138/pdfs/2010-138.pdf

"Occurrence and Spatial and Temporal Variations of Disinfection By-Products in the Water and Air of Two Indoor Swimming Pools" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3447573/

"Ozone Safe Work Practices" http://www.worksafebc.com/publications/high_resolution_publications/assets/pdf/bk47.pdf?_ga=1.178375396.1707185010.1440539318

"Physical demands analyses – a municipal initiative to enhance early return to work" http://www.worksafebc.com/about_us/history/historical_reports/finding_solutions/assets/pdf/98FS-31.pdf?_ga=1.253807176.1707185010.1440539318

"Pool Safe BC Best Practices Guide" http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/poolsafebc.pdf

"Prevalence of Ocular, Respiratory and Cutaneous Symptoms in Indoor Swimming Pool Workers and Exposure to Disinfection By-Products (DBPs)" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2872330/

"Review of Florida Red Tide and Human Health Effects" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3014608/

"Risk Management Analysis; When, Where and How Ocean Rescue Lifeguards Are Suffering Occupational Injuries" www.sobrasa.org/campeonato/matosinhos_2007/apresenta/Mrizot-Leite, http://www.ilsf.org/drowning-prevention/library/risk-management-analysis-when-where-and-how-ocean-rescue-lifeguards-are or http://www.sobrasa.org/

"The Relationship Between Occupational Sun Exposure and Non-Melanoma Skin Cancer" http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3498471/

United States Lifesaving Association http://www.usla.org/?

Vancouver Lifeguard Association https://www.facebook.com/VancouverLifeguards

WorkSafeBC Guidelines Part 8 http://www2.worksafebc.com/publications/OHSRegulation/GuidelinePart8.asp?_ga=1.220897880.1707185010.1440539318

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http://www.worksafebc.com/publications/newsletters/worksafe_magazine/Assets/PDF/wsm_june_2003.pdf?_ga=1.225609562.1707185010.1440539318

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