



Institute of
Biomedical
Science

Infections Associated with Leisure and Sports Activities



Adolf Weil, the German physician after whom Weil's disease is named.

The risk of infection that is associated with occupations can, and does, extend to certain leisure activities.

Water-associated leisure activities

Water has long been recognized as an important vehicle for the spread of infection, and contact with it during recreation and sport often presents a high risk. Infections associated with swimming pools, water parks, water play areas, spas and aquaria, as well as lakes, rivers and the sea have been described

Swimming pools

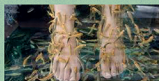
- Often as the result of inadequate chlorination and poor hygiene
- Infections include cryptosporidiosis, giardiasis, shigellosis, *E. coli*, norovirus, polio, ringworm and verruca
- *Pseudomonas aeruginosa* contracted in swimming pools causes 'Swimmer's Ear'
- Use of water slides and inflatables can result in *Pseudomonas folliculitis* in children.

Sea water-associated infection

- Infections with helophagic *Vibrio* spp. from sea water can have severe consequences
- *V. alginolyticus* can cause 'Swimmer's Ear'
- Wounds contracted on beaches can become infected with *V. alginolyticus* as well as *V. vulnificus*
- Fatalities have occurred from infections with *Vibrio vulnificus*.

Jacuzzis, footbaths and spas

- Infections acquired in these is usually a result of poor hygiene and lack of cleaning, particularly the drain
- *Pseudomonas folliculitis*, *Staphylococcus aureus* skin infections and rarely Legionnaires' disease have all been associated with Jacuzzis.
- Infections resulting from the use of Garra Rufa fish to give 'fish pedicures' include *Mycobacterium marinum*, *M. fortuitum* and *M. intermedium*. Cellulitis, loss of toe nails and toes have all been reported
- Outbreaks of Legionnaires' disease and Pontiac fever have been associated with spas



Sealed fish pedicures using Garra Rufa fish have resulted in mycobacterial infections and the loss of toe nails and toes.

Infections in musicians

Although the history of diseases in musicians has traditionally been associated with drug and alcohol abuse, other causes have been recorded throughout history.

Bagpiper's lung

- Deaths have been recorded due to hypersensitivity pneumonitis caused by the inhalation of fungal spores from fungi colonising the bag part of the instrument.
- Similar conditions have been reported involving saxophone and trombone players.
- These occurrences highlight the need for regular cleaning of instruments.



A medieval bagpiper carved on a church in Spain.

Imported African drums

- The first recorded human case of anthrax due to the release of spores from the skin (hide) of a drum imported from Africa, USA, in 1974.
- Subsequent cases have been recorded in Scotland (2006), New York (2006), Connecticut, USA (2007) and London (2008). The Scotland and London cases subsequently proved fatal.

Infections associated with sport



Studies of scrum pax have shown that the players at particular risk are the Left Prop, the Hooker and the two Lock Forwards.

Herpes gladiatorum

- First described in the 1960s
- Caused by herpes simplex type 1. but type 2 can occur
- Associated with contact sports such as:
 - Rugby – scrum pax or herpes ragburnum
 - Wrestling – wrestlers herpes or mat pax.
- 1991: Large outbreak among high-school wrestlers with 60 of 175 of them affected:
 - on head 73%, extremities 42%, and trunk 28%
- Other infections include:
 - impetigo caused by *Streptococcus pyogenes* and/or *Staphylococcus aureus*
 - ringworm, primarily *Trichophyton tonsurans*
 - shingles may spread varicella zoster virus to susceptible individuals.

Hill walkers/climbers

- Walkers and climbers are prone to infection, particularly of the feet following long periods in the wet, due to skin damage caused by blisters and wounds
- Dermatophyte infections (athlete's foot, nail infections) are common.
- Bacterial infection of developing blisters, chafes and wounds.
- There is the risk of Lyme disease in areas where deer are present
- Camping in areas contaminated by cattle faeces presents a risk of infection with *E. coli* O157.

Athletes

- Athletes are at particular risk of pitted keratolysis, a skin infection associated with pit formations on the soles of the feet.
- Causative organisms have been identified as various corynebacteria, *Dermatophilus, Kytococcus, Actinomyces* and *Streptomyces*.

Canoeists and rowers

- Recreational waters present many risks to users
- Leptospirosis (Weil's disease and leptobial fever) as a result of contact with rat urine
- Hepatitis A, enteroviruses including polio and norovirus have all be reported
- Bacterial gastrointestinal infections from sewage-contaminated waters
- In tropical rivers the risk of schistosomiasis is high
- The toxins produced in warm weather by blooms of cyanobacteria (blue-green algae) can cause eye irritation, dermatitis and joint/muscle pain, or, more seriously, gastroenteritis, pneumonia, liver damage and certain neurological condition.



Toxins secreted by cyanobacteria responsible for algal blooms have caused illness.

Fish tank granuloma

- The fish tank in your dentist waiting room is designed to have a soothing influence, but it may hold hidden dangers
- *Mycobacterium marinum* (formerly *M. balnei*) was first isolated from a fish in 1926
- 1951: Found to cause infections in humans
- Large outbreaks of infection have been associated with badly maintained swimming pools
- 1962: Infection with this organism was first associated with a fish tank, and the condition termed 'fish tank granuloma'
- Lesions appear mainly on the hands.
- *M. marinum* does not grow at 37°C, so this may account for it infecting predominantly the cooler parts of the body
- Recognised by the presence of superficial cutaneous lesions in a sporadic distribution
- Occupational hazard for pet shop workers and home aquarium keepers
- Marine biologists and professional fishermen are also at risk
- Also known as aquarium granuloma or swimming pool granuloma.



Fish tank granuloma tends to affect the cooler parts of the body.



Despite their soothing influence, fish tanks hold hidden dangers.

Occupational Health: Work and Play Can Make You Sick
Produced by the History Committee for Congress 2019