

# SWIMMING



SAMUEL JOHN



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## **SWIMMING**

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## Preface

Swimming is one of the most popular recreational activities all over the world. It is also a form of sport in several countries. Health and fitness experts always stress the importance of including swimming in their exercise regime. Swimming improves the blood circulation in the body and is a great workout for all the muscles. It is a form of low impact aerobic activity and increases strength and cardiovascular stamina. Apart from being a full body exercise, it is also a great way to relax and rejuvenate. Besides, the number of injuries associated with swimming is comparatively lesser than other sports.

The aim of competitive swimming is to be the fastest to swim at a given distance and drop time. Competitive swimming became popular in the nineteenth century. It is a popular event at the Olympic Games, where male and female athletes compete in 13 of the recognised events each. The four competitive strokes are the butterfly, backstroke, breaststroke, and freestyle. It is recommended for new swimmers to begin swimming under the guidance and training of a proficient swimming coach. It can be fatal to enter a swimming pool without having prior training.

This book on swimming provides authentic information of each and every aspects of swimming one need to know. Technical guidance and instructions on all aspects of the game have been discussed, alongwith the rules and regulations. It will be highly beneficial for students of physical education, coaches and aspiring swimmers.

**Samuel John**

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## Basics of Swimming

Swimming is an activity that is both useful and recreational for many species. Its primary uses are bathing, cooling, travel, fishing, escape, and sport. An individual's ability to swim can be judged by speed or stamina. Animals with lungs have an easier time floating than those without. Almost all mammals can swim by instinct. Bats, kangaroos, moles and sloths can swim. The few exceptions include apes and possibly giraffes. Land birds can swim or float for at least some time. Ostriches, cassowaries and tortoises can swim.

Drawings from the Stone Age were found in "the cave of swimmers" near Sura, dating back to 2000 B.C. There is evidence that swimming was also a very popular sport in Greece and Italy in the original Olympic games. Athletes would compete in competitions that usually involved many nations competing in water sports in order to gain a prize. In 1538, Nicolas Wynman, German professor of languages, wrote the first swimming book. Competitive swimming in Europe started around 1800, mostly using breaststroke. The front crawl, then called the trudgen was introduced in 1873 by John Arthur Trudgen, copying it from Native Americans.

Swimming was part of the first modern 1896 Summer Olympics games in Athens. In 1900, backstroke was included as an Olympic Event. In 1908, the world swimming association Federation Internationale de Natation was formed. Butterfly was first a variant of breaststroke, until it was

accepted as a separate style in the 1952 Olympics. At present, there are the four recognised strokes of butterfly, backstroke, breaststroke and freestyle; while the IM is a combination of all four of the strokes in a specific order. Butterfly is done first, followed by backstroke, breaststroke, and then finishing with freestyle. Freestyle is actually a choice of stroke in a race. However, most swimmers choose to swim front crawl because it is faster.

### NON-AQUATIC ANIMALS

Gorillas, chimpanzees, bonobos, orangutans, giraffes, and at least some gibbons are among the few mammals which lack the instinctive ability to swim, although they can wade upright in water. There are reports that the siamang can swim. There are reports of apes in zoos falling and drowning in water moats without any struggle. Humans, similarly, do not swim instinctively, but can learn. In contrast, many monkeys can naturally swim and some, like the proboscis monkey, crab-eating macaque, and Rhesus macaque swim regularly.

Some breeds of dog swim recreationally. Umbra, a world record-holding dog, can swim 4 miles (6.4 km) in 73 minutes, placing her in the top 25% in human long-distance swimming competitions. Although most cats hate water, adult cats are good swimmers. The fishing cat is one wild species of cat that has evolved special adaptations for an aquatic or semi-aquatic lifestyle - webbed digits. Tigers and some individual jaguars are the only big cats known go into water readily, though other big cats, including lions, have been observed swimming.

A few domestic cat breeds also like swimming, such as the Turkish Van. Horses, moose, and elk are very powerful swimmers, and can travel long distances in the water. Elephants are also capable of swimming, even in deep waters. Although there is speculation to the contrary, a number of eyewitnesses have confirmed that camels, including Dromedaries and Bactrians, can swim, despite the fact that there is little deep water in their natural habitats.



Both domestic and wild rabbits can swim. Domestic rabbits are sometimes trained to swim as a circus attraction. A wild rabbit famously swam in an apparent attack on U.S. President Jimmy Carter's boat when it was threatened in its natural habitat. The Guinea pig (or cavy) is noted as having an excellent swimming ability, though domestically-kept cavies are rarely given the opportunity to. Mice can swim quite well, despite not naturally having to. They do panic when placed in water, but many lab mice are used in the Morris water maze, a test to measure learning. When mice swim, they use their tails like flagella and kick with their legs.

### GOAL OF COMPETITIVE SWIMMING

The goal of competitive swimming is to be the fastest to swim at a given distance and drop time. Competitive swimming became popular in the nineteenth century, and comprises 34 individual events - 17 male events and 17 female events. Swimming is a popular event at the Summer Olympic Games, where male and female athletes compete in 13 of the recognised events each. Olympic events are held in a 50 meter pool. Competitive swimming's international governing body is FINA (Federation Internationale de Natation), the International Swimming Federation.

The four competitive strokes are the butterfly, backstroke, breaststroke, and freestyle. While "freestyle" and "front crawl" are often used interchangeably, freestyle is the more common name and is used in almost all competitive, club-swimming or international competitions. A swimmer may actually swim any stroke or combination of strokes in a freestyle race. Swimmers generally choose to swim front crawl in a freestyle event since it is typically the fastest stroke. Disqualification will occur if the stroke is not swum correctly, for example if the swimmer does not touch the wall with two hands during breaststroke.

These strokes can be swum individually or together in an individual medley (IM). The IM order is:

- butterfly,
- backstroke,
- breaststroke, and
- freestyle.

There are two types of relays: medley and freestyle. The medley relay order is:

- backstroke,
- breaststroke,
- butterfly, and
- freestyle.

Each of the four swimmers in the relay swims a predetermined distance, dependent on the overall length of the relay. The three relay lengths are 200 meters or yards, 400 meters or yards, and 800 meters or yards. In a 50 meter pool, each swimmer swims one length for the 200 relay, two lengths for the 400 relay, and four lengths for the 800 relay. In a 25 meter or yard pool, each swimmer swims two lengths for the 200 relay, four lengths for the 400 relay, and eight lengths for the 800 relay.

There have also been 100 yard relays that have been done by 8 and under swimmers, but is very rare except in summer recreation leagues. Many full-size competition pools in the United States have a length of 50 meters and a width of 25 yards the Olympic pool size, allowing both short course and long course races to be held.

There are several types of judges: a starter sends the swimmers off the blocks and may also call a false-start if a swimmer leaves the block before the starter sends them; finish judges make sure the swimmers touch the wall with the appropriate number of hands turn judges check that the swimmers' turns are within rules; stroke judges check the swimmers' strokes; time keepers time the swims; and the referee along with the starter and the officials make sure everything is running smoothly. If an official catches a swimmer breaking a rule concerning the stroke he or she is

swimming, that swimmer is said to be disqualified and the swim is not considered valid, and therefore their time is also not valid.

If you would like to join a swim team there is an age limit. In order to be able to swim outdoors on the swim team you may not be any older than 18 years old. Some people are lucky and can swim if they are 19 or stay in an age group an extra year.

The way you know this is if your birthday is June 15th or after. There are 5 age groups: 8&under, 9-10, 11-12, 13-14, and 15-18. If you have a special birthday you stay in the past age group an extra year. There are two different types of meets as well.

There are the 'A' meets that are official meets that you may qualify for a special or bigger meet in if you have a qualifying time. Also, in 'A' meets they keep score to see how each team did at the end of each season. The other meet is a 'B' meet and are used as practice meets where you can only swim your normal, or prime stroke if you did not qualify yet. 'B' meets are like practice meets where they don't keep score and it gives you a chance to try a different stroke in your age group.

In the United States and the United Kingdom, communities may sponsor competitive swimming leagues for children and teenagers, made up of swim teams. These leagues for the most part adhere to recognised swimming rules, swim the standard strokes, but swim shorter lengths as events in swim meets.

These leagues are usually active in the warmer months, and are not directly associated with a national or world swim organisation. However, swimmers who begin their competitive swimming experience on such a local swim team may go on to join a nationally-governed team.

In Australia such competition is usually conducted under the auspices of a club affiliated with the State Association which in turn is affiliated with Swimming

Australia, the FINA accredited body. This provides a direct pathway to top level competition for those capable of taking it while still providing a more relaxed environment for those whose main intent is to have fun swimming competitively.

### *Legendary Swimmers*

Swimmers who have gained fame for their impressive performances include Ian Thorpe, Michael Phelps, Alexander Popov, Vladimir Salnikov, Grant Hackett, Pieter van den Hoogenband, Michael Klim, Ian Crocker, Federica Pellegrini, David Wilkie, Laure Manaudou, Leisel Jones, Mark Spitz, Alain Bernard and Eamon Sullivan.

These people are known very well on the competitive stage for their world record breaking performances and outstanding achievements in olympic events. David Wilkie is noted for being the last British swimmer to win gold at the olympics, and Mark Spitz is noted for his gold medal haul.

### *Changes to the Sport*

Times have dropped over the years due to better training techniques and to new developments in the sport. In the first four Olympics competitions were not held in pools, but rather in open water. The 1904 Olympics' freestyle race was the only one ever measured at 100 yards, instead of the usual 100 meters. A 100 meter pool was built for the 1908 Olympics and sat in the center of the main stadium's track and field oval. The 1912 Olympics, held in the Stockholm harbour, marked the beginning of electronic timing.

Male swimmers wore full body suits up until the 1940's, which caused more drag in the water than their modern swim-wear counterparts. Competition suits now include specially engineered fabric and designs to further reduce swimmers' drag in the water and prevent athlete fatigue. Also, over the years, pool designs have lessened the drag. Some design considerations allow for the reduction of swimming resistance, making the pool faster.

Namely, proper pool depth, elimination of currents, increased lane width, energy absorbing racing lane lines and gutters, and the use of other innovative hydraulic, acoustic and illumination designs. The 1924 Olympics were the first to use the standard 50 meter pool with marked lanes. In the freestyle, swimmers originally dove from the pool walls, but diving blocks were eventually incorporated at the 1936 Summer Olympics. The flip-turn was developed by the 1950s.

### **RECREATIONAL SWIMMING**

The most common purpose for swimming is recreation. Recreational swimming is considered by many a good way to relax, while enjoying a good full-body work-out. Several swimming styles are suitable for recreational swimming; most recreational swimmers prefer a style that keeps their head out of the water and has an underwater arm recovery.

Breaststroke, side stroke, and dog paddle, are the most common strokes utilised in recreational swimming, but the out-of-water arm recovery of freestyle or butterfly gives rise to better exploitation of the difference in resistance between air and water.

The butterfly stroke, which consists of out-of-water recovery with even symmetry in body movements, is most suited to rough water swimming. For example, in a record-setting example of endurance swimming, Vicki Keith crossed the rough waters of Lake Ontario using butterfly. Most recreational swimming takes place in swimming pools, and calm natural waters. Therefore front crawl is suitable.

### **OCCUPATIONAL SWIMMING**

Some occupations require the workers to swim. For example, abalone divers or pearl divers swim and dive to obtain an economic benefit, as do spear fishermen. Swimming is used to rescue other swimmers in distress. There are a number of specialised swimming styles specially for rescue purposes. Such techniques are studied by lifeguards or members of the

Coast Guard. The training of these techniques has also evolved into competitions such as surf life saving.

Swimming is also used in marine biology to observe plants and animals in their natural habitat. Other sciences use swimming, for example Konrad Lorenz swam with geese as part of his studies of animal behaviour. Swimming also has military purposes. Military swimming is usually done by special forces, such as Navy SEALs.

Swimming is used to approach a location, gather intelligence, sabotage or combat, and to depart a location. This may also include airborne insertion into water or exiting a submarine while it's submerged. Swimming has become a professional sport as well. Companies such as Speedo, TYR Sports, Arena and Nike sponsor swimmers who are at the international level. Cash awards are also given at many of the major competitions for breaking records

Swimming is an excellent form of exercise. Because the density of the human body is very similar to that of water, the body is supported by the water and less stress is therefore placed on joints and bones. Swimming is frequently used as an exercise in rehabilitation after injuries or for those with disabilities.

Resistance swimming is one form of swimming exercise. It is done either for training purposes, to hold the swimmer in place for stroke analysis, or to enable swimming in a confined space for athletic or therapeutic reasons. Resistance swimming can be done either against a stream of moving water or by holding the swimmer stationary with elastic attachments.

Swimming is primarily an aerobic exercise due to the long exercise time, requiring a constant oxygen supply to the muscles, except for short sprints where the muscles work anaerobically. As with most aerobic exercise swimming is believed to reduce the harmful effects of stress. Swimming can improve posture and develop a strong lean physique, called, logically, a "swimmer's build": lean and spare throughout, with wide shoulders and a smaller lower body.

## **RISKS OF SWIMMING**

Swimming is a healthy activity and enjoys a low risk of injury compared with many other sports. Nevertheless there are some health risks with swimming, including the following:

- Drowning, inhalation of water arising from
- Adverse water conditions swamping or overwhelming the swimmer or causing water inhalation.
- Actions of others pushing under water accidentally in play or intentionally.
- Exhaustion or unconsciousness.
- Incapacitation through shallow water blackout, heart attacks, carotid sinus syncope or stroke.

### **Adverse effects of immersion**

- Secondary drowning, where inhaled salt water creates a foam in the lungs that restricts breathing.
- Salt water aspiration syndrome.
- Thermal shock after jumping into water can cause the heart to stop.
- Exostosis which is an abnormal growth in the ear canal due to the frequent, long-term splashing of water into the ear canal.

### **Exposure to chemicals**

- Disinfectant Chlorine will increase the pH of the water, if uncorrected the raised pH may cause eye or skin irritations.
- Chlorine inhalation; breathing small quantities of chlorine gas from the water surface whilst swimming for long periods of time may have an adverse effect on the lungs, particularly for asthmatics. This problem may be resolved by using a pool with better ventilation, with an outdoor pool having the best results.
- Chlorine also has a negative cosmetic effect after repeated long exposure, stripping brown hair of all

colour, turning it very light blonde. Chlorine damages the structure of hair, turning it "frizzy." Chlorine can dissolve copper which turns blonde hair green. Proper pool maintenance can reduce the amount of copper in the water, while wetting the hair before entering a pool can help reduce the absorption of copper.

- Chlorine will often remain on skin in an anhydrous form, even after several washings. The chlorine becomes odorous once it is back in an aqueous solution.

### Infection

- Water is an excellent environment for many bacteria, parasites, fungi and viruses affecting humans depending on water quality.
- Skin infections from both swimming and shower rooms can cause athlete's foot. The easiest way to avoid this is to dry the space between the toes.
- Microscopic parasites such as *Cryptosporidium* can be resistant to chlorine and can cause diarrheal illness when swimmers swallow pool water.
- Ear infections, otitis media.
- When chlorine levels are improperly balanced, severe health problems may result, such as chronic bronchitis and asthma.

### Swimmer's own actions

- Overuse injury; competitive butterfly stroke swimmers for example may develop some back pain, including vertebral fractures in rare cases, and shoulder pain after long years of training, breaststroke swimmers may develop knee pain, and hip pain, and freestyle and backstroke swimmers may develop shoulder pain, commonly referred to as swimmer's shoulder.
- Hyperventilation in a bid to extend underwater breath-hold times lowers blood carbon dioxide resulting in suppression of the urge to breathe and consequent loss



of consciousness towards the end of the dive, see shallow water blackout for the mechanism.

#### Adverse water and weather conditions

- Currents, including tides and rivers can cause exhaustion, can pull swimmers away from safety, or pull swimmers under water.
- Wind enhances waves and can blow a swimmer off course.
- Hypothermia, due to cold water, can cause rapid exhaustion and unconsciousness.
- Sunburn severity can be increased by reflections in the water and the lack of clothing worn during swimming. Long-term exposure to the sun contributes to risk of skin cancer.

#### Objects in the water

- Propeller damage is a major cause of accidents, either by being run over by a boat or entanglement on climbing into a boat.
- Collision with another swimmer, the pool walls, rocks or boats.
- Diving into a submerged object, or the bottom, often in turbid water.
- Snagging on underwater objects, particularly submerged branches or wrecks.
- Stepping on sharp objects such as broken glass.

#### Aquatic life

- Stings from jellyfish and some corals.
- Piercings caused by sea urchins, zebra mussels, stingrays.
- Bites from sharks and other fish and snakes, and pinches from lobsters or crabs.
- Electrocutation from electric rays and electric eels.

Organisations publish safety guidelines to help swimmers avoid these risks.