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Walking (also known as ambulation) is one of the main gaits of locomotion among legged animals, and is typically slower than running and other gaits. Walking is defined by an 'inverted pendulum' gait in which the body vaults over the stiff limb or limbs with each step. This applies regardless of the number of limbs - even arthropods with six, eight or more limbs.

The word walk is descended from the Old English wealcan "to roll". In humans and other bipeds, walking is generally distinguished from running in that only one foot at a time leaves contact with the ground and there is a period of double-support. In contrast, running begins when both feet are off the ground with each step. This distinction has the status of a formal requirement in competitive walking events. For quadrupedal species, there are numerous gaits which may be termed walking or running, and distinctions based upon the presence or absence of a suspended phase or the number of feet in contact any time do not yield mechanically correct classification.[1] The most effective method to distinguish walking from running is measurement via a force plate, but definitions based on the percent of the stride in which a foot is in contact with the ground (averaged across all feet) of greater than 50% contact corresponds well with identification of 'inverted pendulum' mechanics via force plate measurements for animals with any number of limbs.[1]

Although walking speeds can vary greatly depending on factors such as height, weight, age, terrain, surface, load, culture, effort, and fitness, the average human walking speed is about 5 kilometres per hour (km/h), or about 3.1 miles per hour (mph). Specific studies have found pedestrian walking speeds ranging from 4.51 km/h to 4.75 km/h for older individuals to 5.32 km/h to 5.43 km/h for younger individuals.[2][3] An average human child achieves independent walking ability around 11 months old.[4]

A pedestrian is a person who is walking on a road, pavement or path.

Health benefits of walking

Sustained walking sessions for a minimum period of thirty to sixty minutes a day, five days a week, with the correct walking posture,[5][6] reduces health risks and has various overall health benefits,[7] such as reducing the chances of cancer, type 2 diabetes, heart disease, anxiety and depression.[8] Life expectancy is also increased even for individuals suffering from obesity or high blood pressure. Walking also increases bone health, especially strengthening the hip bone, and lowering the more harmful bad low-density lipoprotein (LDL) cholesterol, and raises the more useful good high-density lipoprotein (HDL) cholesterol.[9][10][11][12][13][14][15][16]

Studies have found that walking can also prevent dementia and Alzheimer's.[17]

Paleoanthropology and ambulation

Judging from footprints discovered on a former shore in Kenya, it is thought possible that ancestors of modern humans were walking in ways very similar to the present activity as much as 1.5 million years ago.[18][19]

As a leisure activity

Many people walk as a hobby, and in our post-industrial age it is often enjoyed as one of the best forms of exercise.[22] Fitness walkers and others may use a pedometer to count their steps. The types of walking include bushwalking, racewalking, weight-walking, hillwalking, volksmarching, Nordic walking and hiking on long-distance paths. Sometimes people prefer to walk indoors using a treadmill. In some countries walking as a hobby is known as hiking (the typical North American term), rambling (a somewhat dated British expression, but remaining in use because it is enshrined in the title of the important Ramblers), or tramping. Hiking is a subtype of walking, generally used to mean walking in nature areas on specially designated routes or trails, as opposed to in urban environments; however, hiking can also refer to any long-distance walk. More obscure terms for walking include "to go by Marrow-bone stage", "to take one's daily constitutional", "to ride Shanks' pony", "to ride Shanks' mare", or "to go by Walker's bus". Among search and rescue responders, those responders who walk (rather than ride, drive, fly, climb, or sit in a communications trailer) often are known as "ground pounders".[23][24]

The Walking the Way to Health Initiative is the largest volunteer led walking scheme in the United Kingdom. Volunteers are trained to lead free Health Walks from community venues such as libraries and GP surgeries. The scheme has trained over 35,000 volunteers and have over 500 schemes operating across the UK, with thousands of people walking every week.

Professionals working to increase the number of people walking more usually come from 6 sectors: health, transport, environment, schools, sport & recreation and urban design. A new organization called Walk England launched a web site on the 18th June 2008 to provide these professionals with evidence, advice and examples of success stories of how to encourage communities to walk more. The site has a social networking aspect to allow professionals and the public to ask

questions, discuss, post news and events and communicate with others in their area about walking, as well as a "walk now" option to find out what walks are available in each region.

The world's largest registration walking event is the International Four Days Marches Nijmegen. The annual Labor Day walk on Mackinac Bridge draws over sixty thousand participants. The Chesapeake Bay Bridge walk annually draws over fifty thousand participants. Walks are often organized as charity events with walkers seeking sponsors to raise money for a specific cause. Charity walks range in length from two mile (3 km) or five km walks to as far as fifty miles (eighty km). The MS Challenge Walk is an example of a fifty mile walk which raises money to fight multiple sclerosis. The Oxfam Trailwalker is a one hundred km event.

Sheep walking along a road

In Britain, the Ramblers is the biggest organization that looks after the interests of walkers. A registered charity, it has 139,000 members. The Ramblers' run Get Walking Keep Walking project provides free routes, led walks and information specifically designed for people new to walking.[25]

Regular, brisk cycling or walking can improve confidence, stamina, energy, weight control, life expectancy and reduce stress. It can also reduce the risk of coronary heart disease, strokes, diabetes, high blood pressure, bowel cancer and osteoporosis. Modern scientific studies have shown that walking, besides its physical benefits, is also beneficial for the mind — improving memory skills, learning ability, concentration and abstract reasoning, as well as reducing stress and uplifting one's spirits.

As a form of tourism there are many options for walking. The most famous one would be "walking tours" normally offered in different cities by paid guide tours. However, there are some volunteers that can drive walking tours for tourists and do not charge for it, but just ask for a small tip at the end of the walk.

As transportation

Walking is the most basic and common mode of transportation and is recommended for a healthy lifestyle, and has numerous environmental benefits. However people are walking less in the UK, a Department of Transport report found that between 1995/97 and 2005 the average number of walk trips per person fell by 16%, from 292 to 245 per year. Many professionals in local authorities and the NHS are employed to halt this decline by ensuring that the built environment allows people to walk and that there are walking opportunities available to them:

"Walking is convenient, it needs no special equipment, is self-regulating and inherently safe. Walking is as natural as breathing." John Butcher, Founder Walk21, 1999

On roads with no sidewalks, pedestrians should always walk facing the oncoming traffic for their own and other people's safety.[citation needed]

When distances are too great to be convenient, walking can be combined with other modes of transportation, such as cycling, public transport, car sharing, carpooling, hitchhiking, ride sharing, car rentals and taxis. These methods may be more efficient or desirable than private car ownership, being a healthy means of physical exercise.

Walkability

There has been a recent focus among urban planners in some communities to create pedestrian-friendly areas and roads, allowing commuting, shopping and recreation to be done on foot. The concept of walkability has arisen as a measure of the degree to which an area is friendly to walking. Some communities are at least partially car-free, making them particularly supportive of walking and other modes of transportation. In the United States, the Active Living network is an example of a concerted effort to develop communities more friendly to walking and other physical activities.

Walking is also considered to be a clear example of a sustainable mode of transport, especially suited for urban use and/or relatively shorter distances. Non-motorised transport modes such as walking, but also cycling, small-wheeled transport (skates, skateboards, push scooters and hand carts) or wheelchair travel are often key elements of successfully encouraging clean urban transport.[26] A large variety of case studies and good practices (from European cities and some worldwide examples) that promote and stimulate walking as a means of transportation in cities can be found at Eltis, Europe's portal for local transport.[27]

The development of specific rights of way with appropriate infrastructure can promote increased participation and enjoyment of walking. Examples of types of investment include pedestrian malls, and foreshoreways such as oceanways and riverwalks.

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The Health Benefits of Fasting, by Will Carroll

Update on Tue, 01/15/2008 - 12:02pm (Biology 103 1994-2005)

There has been much contention in the scientific field about whether or not fasting is beneficial to one's health. Fasting is an integral part of many of the major religions including Islam, Judaism and Christianity. Many are dubious as to whether the physiological effects are as beneficial as the spiritual promoted by these religions. There is a significant community of alternative healers who believe that fasting can do wonders for the human body. This paper will look at the arguments presented by these healers in an attempt to raise awareness of the possible physiological benefits that may result from fasting.

Fasting technically commences within the first twelve to twenty-four hours of the fast. A fast does not chemically begin until the carbohydrate stores in the body begin to be used as an energy source. The fast will continue as long as fat and carbohydrate stores are used for energy, as opposed to protein stores. Once protein stores begin to be depleted for energy (resulting in loss of muscle mass) a person is technically starving. (1)

The benefits of fasting must be preceded by a look at the body's progression when deprived of food. Due to the lack of incoming energy, the body must turn to its own resources, a function called autolysis. (2) Autolysis is the breaking down of fat stores in the body in order to produce energy. The liver is in charge of converting the fats into a chemical called a ketone body, "the metabolic substances acetoacetic acid and beta-hydroxybutyric acid" (3), and then distributing these bodies throughout the body via the blood stream. "When this fat utilization occurs, free fatty acids are released into the blood stream and are used by the liver for energy." (3) The less one eats, the more the body turns to these stored fats and creates these ketone bodies, the accumulation of which is referred to as ketosis. (4)

Detoxification is the foremost argument presented by advocates of fasting. "Detoxification is a normal body process of eliminating or neutralizing toxins through the colon, liver, kidneys, lungs, lymph glands, and skin." (5). This process is precipitated by fasting because when food is no longer entering the body, the body turns to fat reserves for energy. "Human fat is valued at 3,500 calories per pound," a number that would lead one to believe that surviving on one pound of fat every day would provide a body with enough energy to function normally. (2) These fat reserves were created when excess glucose and carbohydrates were not used for energy or growth, not excreted, and therefore converted into fat. When the fat reserves are used for energy during a fast, it releases the chemicals from the fatty acids into the system which are then eliminated through the aforementioned organs. Chemicals not found in food but absorbed from one's environment, such as DDT, are also stored in fat reserves that may be released during a fast. One fasting advocate tested his own urine, feces and sweat during an extended fast and found traces of DDT in each. (5)

A second prescribed benefit of fasting is the healing process that begins in the body during a fast. During a fast energy is diverted away from the digestive system due to its lack of use and towards the metabolism and immune system. (6) The healing process during a fast is precipitated by the body's search for energy sources. Abnormal growths within the body, tumors and the like, do not have the full support of the body's supplies and therefore are more susceptible to autolysis. Furthermore, "production of protein for replacement of damaged cells (protein synthesis) occurs more efficiently because fewer 'mistakes' are made by the DNA/RNA genetic controls which govern this process." A higher efficiency in protein synthesis results in healthier cells, tissues and organs. (7) This is one reason that animals stop eating when they are wounded, and why humans lose hunger during influenza. Hunger has been proven absent in illnesses such as gastritis, tonsillitis and colds. (2) Therefore, when one is fasting, the person is consciously diverting energy from the digestive system to the immune system.

In addition, there is a reduction in core body temperature. This is a direct result of the slower metabolic rate and general bodily functions. Following a drop in blood sugar level and using the reserves of glucose found in liver glycogen, the basal metabolic rate (BMR) is reduced in order to conserve as much energy within the body as can be provided. (2) Growth hormones are also released during a fast, due to the greater efficiency in hormone production. (7)

Finally, the most scientifically proven advantage to fasting is the feeling of rejuvenation and extended life expectancy. Part of this phenomenon is caused by a number of the benefits mentioned above. A slower metabolic rate, more efficient protein production, an improved immune system, and the increased production of hormones contributes to this long-term benefit of fasting. In addition to the Human Growth Hormone that is released more frequently during a fast, an anti-aging hormone is also produced more efficiently. (7) The only reliable way to extend the lifespan of a mammal is under-nutrition without

malnutrition." (5) A study was performed on earthworms that demonstrated the extension of life due to fasting. The experiment was performed in the 1930s by isolating one worm and putting it on a cycle of fasting and feeding. The isolated worm outlasted its relatives by 19 generations, while still maintaining its youthful physiological traits. The worm was able to survive on its own tissue for months. Once the size of the worm began to decrease, the scientists would resume feeding it at which point it showed great vigor and energy. "The life-span extension of these worms was the equivalent of keeping a man alive for 600 to 700 years." (8)

In conclusion, it seems that there are many reasons to consider fasting as a benefit to one's health. The body rids itself of the toxins that have built up in our fat stores throughout the years. The body heals itself, repairs all the damaged organs during a fast. And finally there is good evidence to show that regulated fasting contributes to longer life. However, many doctors warn against fasting for extended periods of time without supervision. There are still many doctors today who deny all of these points and claim that fasting is detrimental to one's health and have evidence to back their statements. The idea of depriving a body of what society has come to view as so essential to our survival in order to heal continues to be a topic of controversy.

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