Tibb, Physis and Exercise

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Feb 2013

A sedentary lifestyle contributes to the development of several chronic ailments. Fortunately, regular physical activity, even short term, has been convincingly shown to improve a personís health, enhance the quality of life, and increase life expectancy. People who habitually exercise show a significantly lower risk of contracting a number of chronic disorders, such as heart disease, hypertension, diabetes, obesity, osteoporosis, and even some cancers. The benefit of exercise is most evident when it is taken up during adolescence or young adulthood; however, it also applies to those who adopt it in their later years. Exercise is also of value during pregnancy and convalescence, and for those who are overweight, affected by diabetes, emotional disorders or insomnia. Finally, those with, or at risk of, a number of cardiovascular and musculoskeletal disorders will also respond positively. Tibb strongly supports a person undertaking regular physical exercise. It views it as a proven, cost-effective way of reducing the risk of developing chronic disorders, especially when conducted in conjunction with other lifestyle factors - namely, an appropriate diet, better breathing, improved sleep, resolved emotional stress, and more efficient elimination processes. The support that exercise gives to Physis, the bodyís organising principle which is expressed as its capacity for self-healing, is also important in restoring the person to optimum health. A number of realistic and effective exercise formats, both generic and Tibb recommended are accessible, including aerobic (such as walking, jogging, cycling and swimming), and isometric techniques (weight training and stretching, for example). A major obstacle faced by a person when considering exercising regularly is the lack of motivation over the long term. This can be overcome by emphasising the undoubted benefits a simple, regular and safe programme can bring to him or her, and the family.

Background

The value of regular and reasonable physical exercise in achieving and maintaining good health has long been recognised. In the present healthcare climate it makes good sense to look at natural ways of coping with the most common ailments without resorting to conventional drugs. We now know that non-pharmacological routes to health can achieve much, and without the problems associated with drugs. Furthermore, more and more people feel that we should take more responsibility for our own health, and seek out ways to improve our health in body and mind, without using drugs.

The obesity epidemic in South Africa has made many consider physical exercise as a cost-effective way of reducing body mass

Regular exercise is not an easy habit to adopt, so successful and long-lasting motivation is clearly a problem.

It is not necessary to spend long hours exerting to near-exhaustion in order to reap the real health benefits of exercise

Although many are aware of the health and cosmetic benefits it confers, most find it too time consuming, socially intrusive, and, alas, *boring*. The reality is, unfortunately, that few adults (<10%) take exercise more than four times weekly. Even those who undertake an exercise programme, most (> 50%) quit within 6 months. For children, who are actually born motivated for physical activity, the picture is even bleaker. Today, only a small percentage of children in most countries possess even basic levels of muscular strength, flexibility and, worryingly, cardiovascular endurance. Part of the problem seems to be that physical exercise in schools is usually linked to athletic prowess (which excludes most), not to long-term health benefits.

The reality is that physical activity is beneficial in dealing with a host of common chronic conditions, and is applicable at all ages. No-one is too young or too old to partake in an exercise programme. For the young, it is a good health insurance policy; for the elderly, it can turn back the clock. For all, it notches up the feel-good factor – and it does not require long hours at the gym, or pounding the pavement.

Tibb and Exercise

The dominant feature of life, from the simplest bacterium to the highest human form, from birth to death, is movement at all levels of organisation. Even when the body is resting or dormant, there is substantial physical activity in cells, tissues and organs. The energy needed for movement is provided by the potential metabolic energy embedded in the living tissues, which, in humans, is derived from the food we eat.

"Every movement and repose has its origin or source which is Physis – the principle organiser of our body" Aristotle 450-380 BCE

All bodily movement converts cellular metabolic energy into body heat. An increase in movement generates an increased amount of heat. Under normal circumstances this is accompanied by an increase in another quality basic qualitative state when natural movement *Moist*. As movement continues (as when the body-generated heat also increases. However, decreases, leading to a corresponding rise in qualitative state is now *Hot & Dry*. If vigorous then this increasingly excessive Hot & Dry poses problems for the person, who starts to Dehydration will likely develop, together with a body heat. The efficient working of the person's body could be compromised, as the body now enters a qualitative *Cold & Dry* state.

"Walking is man's best medicine". **Hippocrates (460 - 377 BCE), generally considered the 'Father of Medicine'**

– *moistness*. So the is underway is *Hot &* person exercises), moistness now dryness. The exercise is pursued, qualitative state overheat. dangerous loss of

Tibb has long been a keen advocate of maintaining a balance between physical exercise and bodily rest as a major factor in good health, both in mind and body. The increase in heat experienced by the person undertaking exercise is a valuable treatment adjunct in those disorders which benefit from an increase in body heat. It recognises that our voluntary movements also influence our involuntary muscular activities. Walking, swimming and jogging, for instance, not only improve our physical condition, but also influence

" ... give every person the right amount of nourishment and exercise, not too little, not too much, we would have found the safest way to health". **Hippocrates**

involuntary or autonomous activities like heart functions, blood flow and the digestive process. This tradition originates with Hippocrates, who was convinced of the therapeutic value of physical activity. He recommended moderate amounts of exercise, and his patients were encouraged to take frequent walks.

Hippocrates also advised appropriate *resting*. Rest and relaxation produce moistness and cooling. Even so, the benefits brought about by rest can be dissipated if taken to excess. Too much rest can in fact be harmful. Different people have different needs for both exercise and rest. It therefore comes as no great surprise that one of the major Lifestyle Factors in Tibb is physical exercise, balanced by physical rest.

In Tibb, the practical aspects of exercise and rest are determined by three factors:

(a) The person's *temperament*. Each of us is unique, and benefits to different degrees from certain exercises. Treadmill or spinning exercise may be fine for people of a certain temperament; it may not suit others of a different temperament. Tibb asserts that physical exercise needs to be matched to the person's temperamental type. Also, the balance of movement and rest should also be determined by the person's temperament.

(b) The need to encourage inner healing by supporting *Physis*.

(c) The degree of *qualitative disharmony*. At each stage of a chronic disorder the disequilibrium between the four qualities (heat, moistness, coldness, dryness) changes. So the type and amount of physical exercise varies according to the seriousness of the disorder.

Tibb accepts that few exercise programmes are successful. A major impediment is the lack of long-term commitment by the person of time and effort, and disruption of personal and social life. Not everyone realises the true value of exercise; nor do they appreciate that the 'returns on investment' are not immediate, and take time. Tibb feels that educating the person on the benefits of exercise and relaxation by providing suitable information, and backed up by information, is most likely necessary.

What are the objectives of exercise?

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Physiologically, regular, sustained and moderate physical exercise is essential for good health. It encourages delivery of oxygenated blood, nutrients, vitamins, etc., to all tissues in the person's body. The net result is an improvement in metabolic processes, an increase in physical strength and endurance, a decrease in body fat, and better functioning of the joints and muscle. Moreover, it helps remove the general day-to-day metabolic detritus which builds up in the body's cells and tissues.

People often set themselves up for failure, by aiming for results which are unrealistic and unattainable in the short term

As every person is unique and each has a different range of objectives when undertaking physical exercise. For most people, the main objective is cosmetic improvement. This applies particularly to girls and women, who feel that physical exercise contributes to weight loss, better skin tone and so improved image. Sadly, physical exercise needs to be carried out in tandem with a controlled and appropriate calorie-restricted eating programme. For males, the cosmetic reason for exercising is improved skeletal muscle definition.

For mature adults, improved cardio-vascular health is often the ultimate objective. Physical exercise is seen as a counterblast against a sedentary and less-than-ideal lifestyle. There is increasing awareness of the problems that these bring, especially relating to daily diet and behaviours like excessive alcohol intake and unremitting stress.

For the elderly person the usual objective for taking physical exercise is to delay the aging process. This becomes apparent as a person's body strength deteriorates, skeletal muscle mass diminishes, and physical stature declines. A secondary objective may be to bolster the body's defence mechanisms, especially the immune system, so reducing the risk of contracting certain diseases.

There are three popular forms of physical exercise:

Aerobic. Examples of this low-impact form of exercise are brisk walking, jogging, rowing, cycling, swimming, dancing and climbing stairs. This type is particularly suitable for improving endurance and general well-being, especially in out-of-shape people and the elderly. It leads to a marked increase in heart- and breathing-rates, induces light sweating, and improves oxygen utilisation. It helps protect muscles and bones from deteriorating. This form is often selected for people who wish to improve cardiovascular health, and those at risk of hypertension, diabetes and stroke. Metabolic effects include reduction in cholesterol levels and blood sugar.

Isometric. Examples are weight training, press-ups and squats. This type of exercise benefits all, especially the elderly, by, for instance, boosting overall body strength by inhibiting muscle erosion, improving digestion, burning excess fat, and helping to maintain bone density. Metabolically it leads to a reduction in LDL-cholesterol.

Flexibility training. Examples of these stretching exercises include Yoga and T'ai Chi. This type of exercise focuses on improving body balance and flexibility, and helps prevent cramps and muscle stiffness, especially in the back. Proper breathing is encouraged, so it contributes to a lowering of stress.

Benefits of physical exercise

After a reasonable period of physical exercise, a number of benefits will accrue. Tibb and other physical exercise help the person in two ways: first, by supporting Physis; there is a direct correlation between exercise and the immune or protective systems, which are major aspects of Physis. Second by restoring inner harmony. This is achieved by redressing the balance between the different qualities which have become discordant due to a faulty lifestyle.

Exercise improves health, and helps prevent the onset of life-threatening disorders such as diabetes, heart disease and cancer

The main benefits of exercise can be summarised:

- ✓ Helps to achieve and maintain a person's desirable body mass
- ✓ Reduces blood pressure in people who have hypertension
- ✓ Helps improve the blood lipid profile, especially cholesterol and triglycerides
- ✓ In diabetic or pre-diabetic people, helps keep blood glucose under control
- ✓ Helps to build and maintain bone density and strength
- ✓ Improves arm, leg and spine joint flexibility
- ✓ Helps alleviate feelings of stress, anxiety and depression
- ✓ Reduces the risk of developing cancers, especially of the colon
- ✓ In the elderly, keeps physical strength, balance and endurance for longer
- ✓ The consumption of drugs for disorders like hypertension, arthritis, diabetes, depression and insomnia can often be significantly reduced.

Benefits in specific areas

Improving cardiovascular health. We have known for some time now that inactivity is a major risk factor for coronary heart disease, stroke and hypertension, especially if the person smokes and is overweight. Regular physical exercise significantly reduces this risk. Even a moderate amount of regular exercise makes the heart stronger and the arteries more flexible, so blood flow throughout the body is more efficient. In addition, blood pressure is reduced, if previously too high, and the chance of a blood clot forming is diminished.

For the best results, exercising frequently is more important than its duration or intensity. The person exercising will experience a temporary rise in heart rate, but over the longer term an actual fall in heart rate will probably be noted. For hypertensive people (especially those at higher risk due to their sedentary lifestyle) moderate aerobic exercise – jogging, for instance – seems to be the best option. Flexibility training, such as T'ai Chi, can be effective, especially if unremitting stress is contributing to cardiovascular disharmony.

Aerobic exercise is now advocated for heart failure patients. There is improved oxygen utilisation, especially in the elderly

In persons with *coronary artery disease* (CAD), where a reduction in "bad" cholesterol (LDL) and a rise in "good" cholesterol (HDL) is sought, aerobic physical exercise is a valuable adjunct to Dietotherapy. LDL-cholesterol is lowered; however, increased HDL levels may only be seen after approximately two years. Time-wise, brisk walking for 45 min/day seems the optimum time for protection against CAD. Regular exercise also helps prevent a second heart attack (and stroke).

In people who exercise, there is a 45% lower risk of CAD than in their matched sedentary contemporaries

People with *hypertension*, no matter what age, gender, or weight, benefit from mild to moderate aerobic exercise. Walking, swimming or running 20 to 30 minutes daily, several times a week can reduce blood pressure to a similar degree as anti-hypertensive drugs like diuretics (approx 10/8 mm Hg).

Enhancing musculoskeletal fitness. Physical exercise strengthens bone in people at risk of osteoporosis. Weight-bearing exercise (such as walking, jogging and weight lifting) can increase bone mass by between 2% and 8% per year. Women should start low-impact aerobic and isometric exercise before adolescence, as bone formation is highest at 20 to 30 years of age. The elderly also benefit from regular mild exercise.

Weight bearing exercise puts stress on bones, and they react by becoming stronger and denser

For people with *osteoarthritis,* mild aerobic exercise reduces joint stiffness and painful episodes, so diminishing its impact on the sufferer's quality of life. It also improves flexibility, and increases both voluntary muscle strength and endurance. Swimming and other water exercises are particularly valuable, as are non-weight bearing exercise like rowing and biking. Exercise reduces pain naturally, and can decrease dependence on painkillers.

In *leg muscle cramps* or the *restless leg syndrome,* the sufferer's symptoms usually arise from poor circulation due to narrowing leg arteries. Regular exercise will alleviate pain, and improve walking endurance – often up to three-fold.

Lower back pain affects up to 80% of people, and in most cases is brought on by poor posture, sedentary lifestyle, bad furniture design and obesity. This responds positively to aerobic exercise, especially walking and swimming, which improves back muscle strength and general flexibility.

Exercise does not make the symptoms of arthritis worse. They actually improve with exercise

Helping the overweight. Regular, medium intensity exercise (for instance, 30 minutes of brisk walking daily) inhibits tissue fat deposition and weight gain in overweight and obese people. Weight loss is more evident if exercise is carried out together with Dietotherapy, and for a reasonable period of time (months). Long term commitment is needed, as there is no 'quick fix'. Something like 120 km of walking or jogging is required to lose 1 kg of fat. Excess belly fat, which can be detrimental to the heart, is best dealt with by rowing exercise and abdominal crunches. Walking and cycling are useful exercises, but swimming less so.

Supporting psychological health. Physical exercise is associated with increased mental vigour, better concentration, shortened reaction time, and improved maths performance. It also helps in creative processes, especially in boosting the imagination. Overall, exercise leads to the person looking younger and better, feeling more vital, and exuding greater self-confidence.

In *depressed* people, exercise has a potent mood-elevating effect. Exercise has been shown to be equivalent to treatment with antidepressants, and this is probably related to the release of endorphins and other mood-enhancing neurotransmitters dopamine and serotonin.

Sleep disturbances are reduced by up to 50% by aerobic exercise, e.g. brisk walking – but not at night

For people with *anxiety* or *sleep disturbances*, exercise is beneficial, especially if stress is the underlying cause. The best results are achieved if exercise is carried out in the morning.

Regular exercise has a marked *de-stressing* effect. First, it provides a mental and physical diversion from daily stressful activities. Second, it improves self-esteem, based on achievement and control over behaviour. And third, it leads to the secretion of the mood-enhancing neurotransmitters (*mentioned above*) which alleviate anxiety.

Assisting pregnancy. Exercise may pose some risk for pregnant women, but the benefits are considered to outweigh the risks. Regular and reasonable physical exercise improves the quality of pregnancy and the likelihood of a delivery on time. It should be carried out three times weekly at least, with warm-up and cool-down periods built in, and plenty of water consumed. Walking is highly beneficial, but swimming is possibly the best option. For these, over-heating does not occur, and blood flow to the uterus is promoted. Back exercises are also important. Jerky or high-impact exercise is not advised, as it may weaken the pelvic floor. For other forms, body temperature should be monitored, as overheating can adversely affect the foetus. During exercise, the heart rate should not exceed 70% to 75% of maximum (that is, no higher than 150 bpm). Throughout pregnancy, Kegel exercises (at least six times daily) should be performed.

As we age, we need a regular fitness regimen in order to maintain optimum physical health and mental well-being

Counteracting the aging process. It is never too late for elderly people to take up moderate exercise. Both aerobic and weight lifting exercises have been shown to be beneficial in elderly or old people.

Although these people are frequently unable to carry out certain activities, it is not always due to their age; it is often because they have progressively become inactive, and don't have the strength, balance and body flexibility they once had. Even in middle age, regular and reasonable exercise, such as regular walking or cycling, can lead to better health, higher activity levels and greater longevity; it is never too late, and the more the better.

Exercise can promote blood flow to the brain, so improving reasoning, reaction time and memory. This may result from stimulation of the growth of the brain's nerve cells involved in recollection. It also improves the response to mental challenge, equivalent to unfit younger people. It may reverse some of the organ damage inflicted by cigarette smoking. Even smokers or people with hypertension can benefit markedly, and survive longer than their unfit peers. One study shows that weight lifting exercise can cut depression by 50% in older people. This is equivalent to the effect of common anti-depressant drugs. Exercise could also contribute to a reduced risk of stroke.

Research suggests that many of the problems in the elderly come from lack of activity, not from aging itself

Physiologically, regular exercise keeps blood vessels supple, improves cardiovascular endurance, strengthens aging bones and increases muscle mass and lung function. Improved body flexibility leads to better balance and coordination, walking speed and physical agility. It also confers an important social advantage – it allows the elderly person to stay independent for longer.

Other benefits of exercise

Stroke. A sedentary lifestyle is a major risk factor for stroke – far greater than smoking, raised cholesterol, hypertension and obesity. Exercise can reduce the risk of stroke dramatically. Intensive exercise (such as jogging 15 to 20 min/day) reduces the risk by 27%, and moderate exercise (30 min/day) by 20%, compared to sedentary people.

Diabetes. Diabetic people are at higher risk of cardiovascular disorders developing. Aerobic exercise confers significant benefits for persons with either Type I or Type II diabetes. Aerobic exercise improves sensitivity to insulin, which helps glucose penetrate body cells, and puts a powerful brake on blood sugar levels. Exercise also leads to better blood circulation, a reduction of elevated blood pressure and cholesterol if present, and helps reduce body mass.

Colds and flu. People who exercise regularly (even 30 minutes brisk walking daily) have fewer episodes of colds and flu per year, with lower absenteeism. What's more, the symptoms tend to disappear sooner. However, athletes are prone to more attacks, as their immune systems are weakened by long-term, excessive physical exercise. If a person is suffering from a respiratory disorder, abstaining from strenuous or moderate exercise is advisable, as it may delay full recovery.

Digestive efficiency. Regular mild to moderate exercise will improve digestion. Irritable bowel syndrome, diverticulitis and gastric ulcers improve. In the elderly, exercise reduces the incidence and severity of gastric bleeding (either spontaneous or due to conventional drugs).

Asthma. Understandably, many people with asthma try to avoid exercise. However, if they avoid cold, dry, pollen-laden polluted air, and have a rescue bronchodilator to hand, then physical exercise can be of benefit. Asthmatic attacks will be fewer, less severe, and of shorter duration. Swimming is the preferred exercise option for asthma sufferers, as the air breathed in is moist and cool.

Cancer. Around 20% of deaths from cancer may be linked to lack of exercise and related obesity. Overweight people also secrete more insulin, which is known to promote tumours. The risk of colon cancer (and perhaps prostate cancer) is lowered by regular moderate exercise. In women, exercise reduces the level of estrogens which are linked to breast cancer. Regular mild to moderate aerobic exercise (approx 150 min per week) benefits cancer survivors, as this improves overall health and prevents recurrence. With breast cancer patients, the benefits of exercise vary according to the stage of life.

Exercise may prevent cancers by speeding up food passage through the gut, so reducing the time the body is exposed to toxins

Nervous system disorders. People with multiple sclerosis, Parkinson's disease or Alzheimer's disease should be prompted to exercise regularly, as it improves body flexibility and reduces both muscle atrophy and spasticity. Walking, aquatic exercises and machine-based exercises are recommended. The positive psychological boost exercise offers is also valuable.

Exercise in children

Childhood is an extremely important phase of development for the child in both body and mind. Physical activity is more than play; a child's energy is directed at movement, which is a rich source of stimulation, learning and development. The foundations for critical competencies like muscle control, hand to eye coordination, and physical attributes like muscle mass, strength and endurance are laid down during the child's early years.

Unfortunately, the opportunities for normal physical activities are becoming fewer and more restricted. The reasons are the security fears of the parents; children generally do less walking than in previous years; physical education in schools is not broadly applied; playing in the street is frowned upon as being too dangerous; and most leisure time is spent in front of electronic gadgetry. As the child's lifestyle inhibits the amount of regular and varied physical activity, so muscle and bone formation decreases. This sets the stage for troublesome cardiovascular and musculoskeletal problems in the future. Furthermore, the proportion of children who are overweight or obese is increasing steadily, visibly, and alarmingly. Diseases like hypertension and diabetes, which were rare phenomena in children only a few years ago are becoming increasingly common. The problem has been substantially aggravated by changes to the daily diet by the advent of energy-rich, attractive and inexpensive fast-foods, or 'junk foods'. These are now probably embedded as a permanent feature of the young person's way of life.

Many adult chronic disorders have their origins in childhood. Most could have been avoided or diminished by systematic and moderate exercise when young.

Young learners who exercise 3 – 4 times weekly get higher than average exam grades

The medical risks, both present and future, of low levels of physical exercise are generally recognised. Attempts to deal with the problem have included the development at grass-roots level of sports activities, such as field athletics and team games. The value of these exercise formats also introduces valuable elements of the sporting code: personal discipline; the need for hard work to achieve success; and the value of self-empowerment.

Exercise supports Physis

One way Physis exerts its beneficial effect in the person who exercises is through the ***endocrine system***. This allows the body to restore harmony, and normalises the quantitative balance.

In the table below the hormonal changes occurring during and after physical exercise are listed.

Hormone	Secreted from	Physiological effect	Effect of exercise
Thyroxine	Thyroid gland	Raises metabolic rate Increases vitality Assists in weight control	*Blood levels rise during exercise and this persists for several hours post-exercise*
Adrenaline	Adrenal gland	Increases heart's efficiency Breaks down fat to be used as fuel	*Levels rise depending on type and intensity of exercise*
Insulin	Pancreas	Controls blood glucose levels	*Blood levels decrease shortly after exercise starts* *Regular exercise increases body's sensitivity to insulin*
Estrogen	Ovaries	Elevates mood Mobilises fatty deposits Lifts low mood	*Increases fat breakdown* *Increases after exercise, and stays high for a few hours*
Testosterone	Testes	Increases metabolic rate Needed for muscle efficiency	*Rises during and after exercise* *Reduces body fat*
Endorphins	Brain	Reduces tension Suppresses appetite Reduces anxiety	*Marked rise during and after exercise*
Growth hormone	Pituitary gland	Repairs body tissues Mobilises fat during exercise Improves skin tone	*Increases after aerobic exercise and weight training*

Another way is by improving ***autophagy***. Exercise is known to help clean up the internal debris accumulated in the body's tissues and cells. During everyday activity all living tissue produces a substantial amount of waste material, from general wear and tear. This 'intracellular rubbish' includes remnants of destroyed micro-organisms, pieces of cellular membranes, discarded sub-cellular organelles like ribosomes and mitochondria, and redundant enzymes. All this has to be removed otherwise it becomes toxic, possibly leading to cellular death. Under the control of Physis, there are well developed natural processes which carry out this detoxication, or 'intracellular housecleaning', and this is termed *autophagy* ('self-eating'). Some of the debris may be salvageable, so can be recycled for repairing cell structures or providing fuel. The rest is sent onto the kidney and liver for expulsion from the body.

Faulty autophagy is implicated in several diseases, such as Alzheimer's dementia, diabetes, muscular dystrophy and some cancers. Also, as we get older, autophagy seems to slow down. This may contribute to some of the signs and symptoms of ageing. Physical exercise appears to accelerate autophagy. By doing so, it contributes to natural detoxication, so maintaining harmony within the body. This may go some way in explaining the benefits of exercise in the middle-aged and elderly groups.

Another example of Physis in action is evident in ***wound healing***. This is a complex sequence of metabolic events made up of four separate processes. Physis ensures that these processes proceed in the correct sequence of time and space, so that healthy tissue replaces the damaged, and that discomfort and blood loss are kept to the minimum. The first one is *haemostasis*, which stops blood loss at the wound site. If this didn't happen quickly, internal harmony would be disrupted severely. The second is *inflammation*. This protective mechanism encourages blood flow to the wound site. A whole series of activities occur at the damaged tissue. There is improved oxygen supply; processes to prevent microbe access to the body; a build-up of repair materials; removal of dead and

damaged tissue; and systems brought into play to immobilise the wound. The latter prevents further damage and blood loss. The third stage is *proliferation*; this is a very intricate sequence of metabolic actions leading to the formation of new tissue at the wound site. Finally, there is *remodelling*, so that the new tissue is virtually identical to that which was previously damaged.

A number of lifestyle factors can interfere with efficient and rapid wound healing. If the person with the wound is diabetic, obese, or poorly nourished, then wound healing can be hampered. Unrelenting stress, especially if excessive alcohol intake is involved, can also have a seriously negative effect.

Older adults experience slower wound healing – due to everyday stress, or impaired nervous and endocrine efficiency

However, it appears that *physical exercise and increased activity can actually improve wound healing*, particularly in the elderly person. Increased physical activity in the form of moderate daily exercise has a positive effect on both the person's physiological efficiency and psychological state.

How to exercise

Preliminaries

The person should arrange for 'protected time' for his or her exercising.
Ideally, the exercise should be carried out regularly.
Before strenuous exercise, the person should consume a reasonable carbohydrate-rich meal.
The intensity and duration of exercise should be changed according to conditions.
A gentle warm-up should be carried out before any strenuous exercise.

Timing

Ideally, 20 to 30 minutes per day of moderate exercise like brisk walking should be enough for most people.
Exercising three times a week is the best option.
During exercises, the person should attempt to coordinate breathing.
Different age groups respond best to different exercise.

During exercise

The person should keep moisture balance, by drinking a reasonable amount of water or diluted fruit juices before, during and after exercise.
The person exercising should listen to the body, and be alert to chest pain, palpitations, undue fatigue, nausea, breathlessness or light-headedness.

Precautions when exercising

The points listed below are most relevant to the person undergoing severe, long-term strenuous exercise. For most people, exercise is mild or moderate in nature, and not likely to lead to any problems. The person should listen to messages from the body, take reasonable precautions, and heed common sense.

Dehydration. This is a real problem, particularly for the endurance events, where a loss of two litres of body fluid per hour is not uncommon. Dehydration can lead to muscle cramps and other distressing consequences. Physical exercise generally should be supported by increased intake of fluid, especially water, taken at regular intervals. Strenuous exercise should be avoided in conditions of high humidity, and when temperature, pollution levels or pollen counts are high.

Avoidance. Physical exercise should be postponed if the person feels ill or fatigued. Big meals should be avoided for at least two hours before strenuous exercise. People feeling faint or experiencing chest pain should stop exercising. If overheating occurs,

40% of men who die during or after exercise had previously experienced and ignored warning signs of heart disease – fainting and chest pain

the exercises must be discontinued. Caffeinated beverages, such as coffee or Coke, should not be consumed by people with high blood pressure.

Asthmatics. People prone to asthma or who have breathing difficulties should exercise only when cleared medically. Asthmatic individuals should tailor their exercise according to the type of asthma they have, whether it be phlegm related or allergic asthma.

Diabetics. People with uncontrolled diabetes, confirmed heart failure or who suffer from epileptic seizures should avoid strenuous, or even moderate, exercise. Prior medical advice is recommended for these people. Blood glucose levels swing dramatically during exercise in diabetic people, so periodic blood glucose monitoring is advised, especially during the early phase of the programme. If an insulin injection is needed, then it should be into a non-exercising muscle.

People with heart problems. The type and intensity of exercise should be agreed to by a medical practitioner.

Only 5% of reported heart attacks occur after strenuous exercise

Anyone with very high blood pressure should not rely on exercise alone, and take advice from their healthcare provider. People taking statins for high cholesterol levels should be aware that endurance may be shortened.

Female athletes. Strenuous regular physical exercise can disturb normal hormone profiles, leading to dysmenorrhoea, a greater risk of osteoporosis, and eating disorders (the *athletes' triad*). Anaemia can occur due to iron depletion.

Other factors. Back injuries are serious, and can arise from, or be aggravated by, poor use of equipment, or from jerky types of exercise,

How to motivate for regular exercise

The benefits of exercise become evident only after several months, if not years, although some subjective improvement will be evident within weeks. However, the need for continuous motivation is very real, because the pressure to abandon the exercise programme may become overwhelming.

For most *men*, the primary motivating factors are the desire for improved muscle tone, a slimmer body, and so a more attractive appearance. The secondary factor is probably the health benefits conferred. The athletically inclined man invariably undergoes strenuous exercise to improve physical strength, extend endurance and/or increase muscle mass.

Children are notoriously averse to physical exercise. The irresistible attraction of the computer, TV and iPads is difficult to counteract

For *women*, the main motivators are overwhelmingly weight loss, better physical configuration or improved cosmetic appearance. In many women, perhaps most, the stated health benefits are not fully appreciated.

One effective motivator is based on the reward system, used by weight-loss programmes. Progress is personally monitored and recorded, and significant advances or improvements rewarded by specific activities.

Writing an exercise prescription for overweight and sedentary patients according to their condition has been successful in reducing health risks

One powerful de-motivating factor is the problem of unending sameness, resulting in boredom. To counteract this, exercise should be perceived differently – not as a *diet*, but as a *menu*. Wherever possible, cross-training should be adopted.

Another is the "I don't have time for exercise" claim. The person concerned should realise that exercise will provide additional vitality to his or her life, and reduce the time lost from, for example, respiratory

diseases and back problems. Arranging for ‘protected time’, or time firmly set aside for exercise, often helps.

Yet another motivation for exercising is that physically active people are prone to fewer coughs and colds and flu, compared to their sedentary peers. This shields the active person from infection acquired at home, or when travelling, or at work. This is a valuable asset, as it has a marked improvement on the person’s quality of life.

Finally, a person who joins a Run for Life group is also rewarded by increased social contacts, which will suit those who lead a lonely life. This increased social contact will bring its own health benefits.

The person’s employer may also help increase motivation. It is now accepted that employee personal welfare is a major contributor to a company’s success. If employees are encouraged to join exercise programmes, then better employee mood, reduced workplace stress, improved vitality and general workplace focus result. Assisting with gym membership, helping organise walking groups, for example, could be considered.

Final comments

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It is an unfortunate fact of life that physical exercise, in common with other approaches to improving health and fitness, will only achieve lasting benefits in the long term. The undesirable changes inflicted on the person’s body over many years cannot be rectified within a short period of time. *There is no quick fix.* However, once achieved, improved fitness leads to a much better quality of life. The deleterious impact of numerous disorders is reduced; the onset of other disorders is delayed; general performance, both physically and mentally, is enhanced; and the risk of injury and accidents is minimised. Furthermore, the person’s protective systems are boosted, reducing the risk of infection and other disorders. And this can be gained for relatively little outlay in money, time and effort.

Further reading

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