

Sports Science

A Complete Introduction



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1

Understanding the Concepts of Sports and Environment

CONCEPT OF ENVIRONMENT

In our society sport fulfils important functions and is indeed indispensable. It offers opportunities for physical activity in a world where physical activity is increasingly diminishing; it promotes good health and well-being; and it provides a means of social contact and ample opportunity for intensive experiences. At the same time, however, sport can be a considerable cause of damage to nature and the environment.

Damage can occur directly as a result of the pursuit of sports activities or the building and operation of the requisite infrastructure, or it can be caused by indirect factors such as the use of cars to travel to and from sports activities.

The causes of the conflict between sport and the environment are inherent in sport itself and are also a consequence of deep-rooted social changes; they may be understood only from this perspective. Since the 1970s, higher income, more leisure, greater mobility and increasing individualisation have formed the basis for major and continuing changes in sport.

These changes include the following:

- A rise in the number of people who pursue sports activities
- A higher degree of differentiation between types of sport and sports equipment as well as motives and reasons
- The use of areas hitherto unused or seldom used and areas already in use being opened up for new purposes
- Spread of activities to periods previously not or seldom made use of
- Fewer ties with sports clubs and their traditions
- Increase in individual, spontaneous activities without proper training
- Increase in activities offered commercially and to a certain extent associated with aggressive advertising

Consequently, these developments have led to wider and more intensive use of particularly attractive but, by nature, vulnerable areas. Sport is claiming more territory, and this is continually putting numerous animal and plant species under threat and causing the loss of natural landscapes. Sport can not only affect nature and landscapes, but can also give rise to other environmental damage.

With regard to this problem, the use of non-renewable resources, the emission of harmful substances during the building and operation of sports facilities, journeys to and from these facilities, and the production and disposal of sports equipment all play a key role.

Sports activities can cause critical damage to and endanger precious and vulnerable locations. However, in terms of overall damage, sport tends to play a lesser role compared to other causes such as agriculture, forestry, industry and transport. In the analysis of conflicts between sport and the environment, areas of overlap with other forms of land use must be taken into account. At the same time, sport is also affected by general damage to the environment caused by other sources. Such

damage includes, for example, a large number of devaluated watercourses, *e.g.* as a result of hydraulic engineering, pollution of soil and water and air.

Thus, while sport can be an obstacle to issues of nature conservation and environmental protection, the two conflicting areas also have common interests. New approaches are required for resolving existing conflicts between sport and the environment in the long term. This means, above all, orienting conservation and utilisation concepts to the principle of sustainability in line with the agreements reached at the Conference on Environment and Development in Rio de Janeiro in 1992.

Sport must be included in the on-going debate on implementation of Agenda 21, which was adopted at the conference. The aim should be for representatives of sport and those promoting the cause of nature conservation and environmental protection to join forces and draw up guidelines for sustainable development in sport.

CRITERIA FOR THE SUSTAINABLE DEVELOPMENT OF SPORT

The model of sustainable development consists in reconciling the improvement of economic and social living conditions with the long-term protection of the natural basis of life in order to also give future generations the opportunity to unfold. It not only addresses governments, but also business and industry, all social groups and, indeed, each individual citizen.

When applied to sport, it becomes necessary to:

- Promote and further develop forms of sport which are compatible with nature and the environment;
- Make sports-related infrastructure more environmentally compatible;
- Reduce damage to vulnerable areas;
- Secure and improve opportunities for sport and physical activity outside vulnerable areas;

- Preserve and increase the recreational quality of countryside and its enjoyment value for those doing sport.

AREAS OF ACTION

This chapter limits itself to outlining central areas of action. The areas of action are linked to one another in a variety of different ways; considering them in isolation fails to do justice to the complexity of the relationships. Therefore, occasional overlaps in content are unavoidable.

Sports Activities in Nature and the Countryside

Sport and nature conservation can be reconciled almost everywhere. Thus conflicts arising from sports activities in nature and the countryside are not a general problem. They seldom arise on a large scale, but tend to be concentrated in specific locations, which are characterised by their special attractiveness for sport, as well as by a particular vulnerability and the need for nature protection. Critical factors with respect to the effect of sports activities on nature are the extent, intensity and type of sport being pursued as well as the resilience of the natural area being used.

In principle, the use of nature for the purposes of sport should stop at the point where the type of activity concerned considerably affects or damages nature or the rural landscape. Thus sports activities should take into due account the degree of ecological resilience of the area concerned. In order to reduce the damage to vulnerable areas early on and at the same time fulfil the task of providing for recreation, nature conservation bodies and representatives of sport should be more involved in the planning of opportunities in resilient landscapes.

A positive impact on the recreational value of countryside is generated as a side effect of the various nature conservation programmes on species and biotope conservation. In the past, some countries have developed promising approaches, above all in the planning and management of sports and leisure

activities. These are essentially aimed at ruling out, or avoiding as far as possible, potential conflicts and lessening existing conflicts. Numerous regulations that have been put into practice and proved successful show that they can meet the demands of both sport and nature conservation.

For example, leisure activities and facilities that are not tied to a particular natural environment or geographical features should be removed from vulnerable areas and transferred to less vulnerable areas of manmade landscapes or situated near residential areas. A wide range of measures such as signposting, shifting car-parks, banning traffic from certain roads, information boards, route marking, maintaining desirable routes and closing down undesirable routes, setting up obstacles such as water-filled ditches or bushes all make it possible to transfer activities from vulnerable to more resilient areas without this being noticed by the people concerned.

Supplementary measures towards the restriction of activities to certain periods of time could be planned. In many cases problems only arise when the same areas are used excessively at the same time. Before the use of such areas is banned altogether, the possibility of restricting numbers of visitors to these areas should be examined, while taking into account social fairness. In order to avoid inadequate enforcement, planning possibilities involving the restriction of infrastructure should be considered.

In cases where the pursuit of sports activities causes harm only at particular times, restrictions during these specific periods should be considered. In this way, nature conservation requirements during the breeding or moulting season of birds or vital periods for other animals can be respected without banning access to areas at other times. It is also possible to reconcile sport with nature conservation by defining maximum permissible group sizes, restricting activities to those which do not pose any threat in the specific situation, declaring certain areas of countryside off-limits, stipulating specific routes, defining maximum permissible boat lengths or permissible type of power source or imposing the requirement of producing specific qualifications.

Voluntary commitments should be given priority for achieving conservation aims as they provide greater clarity for those involved. If this is not possible or proves unsuccessful, a wide variety of different solutions should be implemented. It is the duty of sports organisations and commercial operators to encourage a considerate attitude to nature and the environment by providing information about ecological aspects.

However, environmental education processes will only be effective if all those involved are willing to respect the restrictions and acquire knowledge of nature conservation issues. Restrictive measures intended to protect vulnerable or over-used natural areas are successful particularly when attractive alternatives are offered. These should involve upgrading the land concerned in terms of the aesthetic appeal of the landscape, ecological and recreational aspects, as well as selecting locations which avoid the generation of high traffic volumes.

Artificial facilities for types of outdoor sport which take place in nature or the countryside provide only partial relief. They do not provide a substitute for the experience of nature and may in the long term even serve to increase the use of and thus the pressure on nature. The measures suitable for avoiding and resolving conflicts arising in connection with types of activities pursued in the countryside can be summarised as follows:

- Developing binding, uniform and effective regulations in areas which, for the sake of nature conservation, must be kept free of any use or certain uses
- *Developing and testing effective measures, i.e. measures which can be conveyed and controlled, below the level of a ban*
- Shifting activities and facilities to less vulnerable areas
- Concentrating and managing activities (in terms of location and time)

- Targeted expansion of supply-oriented planning in resilient areas where the countryside should possibly be enhanced
- Creating artificial alternative and substitute facilities
- Obliging all sports operators to organise their events and programmes such that they are compatible with nature and the environment
- Systematically informing and educating people practising sport and multipliers about the possibilities for pursuing activities without affecting nature or the environment

Sport and Physical Activity in Built-Up Areas

People who pursue recreational sports activities in nature and the countryside mainly come from the towns. Both recreational traffic and the activities themselves can cause considerable damage to the environment. If towns offer more suitable opportunities for games, sports and physical activities, it will be possible to ease the pressure on the countryside. Furthermore, tying more people to the area where they live will help to lower environmentally harmful traffic volumes.

To this end, ways must be sought to better satisfy the need for physical activity in the vicinity of residential areas. In order to solve the growing problem of traffic in towns, the aim should be to set up residential structures that put less pressure on people to be mobile. A multifunctional approach to town planning gives rise to "towns with short distances". When it comes to providing residents with sports facilities, this means that adequate and attractive opportunities for sports, games and physical activities for all age groups must be created or preserved in the vicinity of their homes.

These opportunities should be linked to one another via green belts with foot and cycle paths. The "strategy of environment-friendly accessibility" is of utmost importance for areas in the local neighbourhood offering basic opportunities for games, sports and physical activities. If central areas suitable

for games and sports can be easily and safely reached by bicycle or public transport by the residents of a large catchments area, this will reduce ecological damage due to traffic and cater for the needs of children, the disabled, the elderly and other groups which do not have regular use of a car.

The environmental and recreational quality of towns is becoming increasingly important as a "soft" location advantage. Only very cautious adjustments are required to semi-natural areas such as these in order to make them useful. Here there is ample scope for linking aims of nature conservation and recreation by providing semi-natural areas which promise excitement and adventure. It is also possible to put buildings and land to other uses and thus provide facilities for sports and physical activities without taking up additional land.

Redesigning or restructuring former industrial buildings and estates, for example, opens up opportunities to improve the range of recreational facilities available in a region. Earmarking sufficiently large green areas in towns is not only in the interests of sport ("sports-friendly town"), but also of environmental protection ("environment-friendly town"). In the tough battle over different land uses, the representatives of sport and those of the environment should join forces to set up a common lobby for more green areas.

SPORTS FACILITIES

Sports facilities affect the environment in a variety of different ways. When describing and assessing them, a distinction can be made between indoor and outdoor facilities. Compared to sports halls, outdoor facilities require much more space. How this space is treated is of considerable significance to the environment. On the one hand, the wrong choice of location, improper care (over-fertilization, irrigation using drinking water, etc.) and unnecessary soil sealing can cause the loss of valuable habitats and affect the soil and the water balance.

On the other hand, if environmental criteria are taken into account during the planning, building and maintenance of an

outdoor sports facility, especially in conurbations, this can upgrade the area ecologically (biodiversity, microclimate etc.) and thus increase the attractiveness of the residential environment. Sports halls require only about 5 per cent of the area taken up by outdoor facilities.

Excessive energy consumption and water use are the prime causes of environmental damage in the case of sports halls. At present, an average of about 400,000 kWh of energy per year are required for operating one hall in Germany, for instance. Today, reduction of energy consumption in sports halls is mainly concentrated on heating/hot water supply systems, heat insulation and lighting. Practical examples show that there is considerable potential in sports facilities for saving energy and water.

In order to exhaust this potential, modern, resource saving technology must be installed and user habits must be changed. Due to the large savings made as a result, investments in energy and water often pay off within relatively short periods. Building renovation, necessary in any case, and new building plans provide ideal opportunities for installing environment-friendly technology. If environmental aspects are to be considered regularly and not just sporadically, operators of sports facilities need systematic environmental management.

Essential elements of such management include the appointment of an environmental officer, mandatory consideration of environmental aspects when any decision is made, the introduction of eco-controlling, as well as regular environmental training courses for staff. By saving valuable resources, sports facilities designed and run on an environmentally compatible basis can contribute enormously towards sustainable development and thus also to the implementation of Agenda 21. This applies in particular to climate protection through reduction of CO₂ emissions.

To summarise, the following steps are important for making sports facilities more ecological:

- Initiating and supporting green consulting services for sports facility operators

- Tying government and association funding for sports facilities (grants and loans) to the fulfilment of environmental standards
- Considering to a greater extent the possibility of making use of existing areas and buildings for sports facilities
- Incorporating environmental management into the work of sports administrations, clubs, associations and commercial sports operators

Sport and Mobility

Just as in other social sub-systems, mobility requirements in sport have increased significantly over the past years. The reasons are manifold. Sport has not only grown in general - another important development is the constant growth in diversity. New types of sport frequently generate the need for a greater range of different facilities. Reaching new locations (sports facilities or country areas) demands greater mobility.

This is particularly true in the case of activities pursued in nature and the countryside, to which soaring numbers of people have been drawn over many years. Since most people have to travel short or long distances in order to pursue these kinds of activities, sports and tourism are today more closely linked than ever before.

Nowadays, sport is often even the principal reason for travel (*e.g.* skiing holidays), and in other cases the activities offered are at least an important factor in the choice of travel destination. Even in built-up areas, people pursuing sports activities are required to be more mobile. This is mainly due to the geographical separation of working, living and leisure.

In particular, the fact that sports and leisure centres are increasingly built on the periphery of towns (in green suburbs) has increased the distance to and from sports activities. However, sport is not only to be found in sports facilities, but, particularly in the towns, in public areas too (parks, play areas in streets, cycle paths etc.).

Due to other priorities in town planning over the past decades, there is now a shortage of such options. Opportunities for physical activity, games and sports have been pushed out of town life by new roads and streets, land sealing etc., and this has resulted in people looking more than ever beyond the towns for the recreational facilities they need. The sustainable development of sport requires not only the avoidance of unnecessary traffic, but also provision and use of means of transport that are the least harmful to the environment.

The goal and the reality are still very far apart. Mobility in sport today is primarily "auto mobility". Sport thus contributes considerably to traffic volumes and thus also to climate change. Already, more than half of total distances travelled by cars are travelled during leisure time, of which in turn, according to a Swiss study, 25 per cent are linked to sport.

With respect to sports activities pursued in the country, two of the main reasons for the high level of private car use are the considerable requirements regarding equipment and transport and the difficulties when using public transport, particularly the limited possibilities for taking along sports equipment, the lack of transfer facilities between stations and actual destinations, and the fact that routes and frequency of buses and trains are inadequate considering the leisure time demand.

Amazingly, however, even in the case of sports activities pursued in built-up areas, private cars seem to be the absolute number-one means of transport. According to a study carried out at the University of Bayreuth (Germany), three quarters of organised adult volleyball players' travel to their training sessions and home matches by car or motorbike. 55 per cent of the distances in question, however, are 5 km at the most.

Sports associations and clubs are thus called upon to create the necessary structures for more environment-friendly mobility on the part of their members and to encourage their members accordingly to change their habits. To achieve environment-friendly mobility in sport, the following should be given priority,

- Enhancing the residential environment and expanding opportunities for sport, games and physical activity in public areas within the urban area
- Encouraging the use of bicycles (linking sports centres to local cycle path networks, setting up safe places to park bicycles at sports facilities etc.)
- Making buses and trains more attractive as a means of transport during leisure time (routes, timetables, fares, possibilities for transporting sports equipment) etc.
- Improving hiring and storage facilities for sports equipment at the place of destination
- Increasing the awareness of those doing sports (coaches and instructors setting an example, lift-sharing etc.)

Sports Equipment

The growth of sport and its continuing diversification into new kinds of activity, particularly in the 1980s, led to an explosion in the market for sports articles. Sports articles today consist of mass products. Environmental damage can occur at any stage of the life cycle of a sports article, namely during the acquisition of raw materials, preproduction, actual production of the article, sales, use and disposal. Until now, so-called end-of-pipe strategies have been predominant in the sports article industry: these strategies focus on the subsequent reduction of pollution that has already occurred.

The development of new sports equipment revolves almost solely around aspects of function and fashion. Environmental aspects play a role only in exceptional cases. For the sake of greater functionality in sports articles, materials are often used which cause substantial ecological damage even at the time of manufacture, or which cause problems at the latest when they are disposed of. The latter applies particularly to so-called composite materials, which as a rule cannot be

recycled back into the original materials. Supply and demand influence each other in the sports article industry too. On the one hand, the industry has adapted its products to the serious changes in sports and leisure and responded to the consumer's changed preferences. On the other hand, the industry has helped to shape sports trends and consumer behaviour by means of new and ever more spectacular products.

Against this background, marketing sports equipment without paying heed to the environmental damage it causes and advertisements showing behaviour that is damaging to nature and even, in some cases, unlawful are particularly problematic. A more environmentally aware approach in the sports article industry should centre on preventative rather than simply corrective environmental protection measures. Above all, this means giving (in the future) ecological aspects high priority even at the product development stage.

The main aims should be to minimise negative environmental effects in the life cycles of all products and to promote substance cycles. Here, the use of recyclable materials is especially important as is unmixed production and the easy separability of materials used. It is not possible to create substance cycles simply through the activities of sports equipment manufacturers. Instead, there must be very close cooperation between manufacturers, suppliers and dealers. Such cooperation is an absolute prerequisite for the production of recyclable products and the development of a functional collection and recycling system.

The key steps towards greater environmental compatibility in the sports article industry are as follows:

- Taking ecological aspects (longevity, reparability, recyclability) into account even at product development stage
- Elaborating life-cycle analyses for widespread sports articles
- Checking present possibilities for recycling or environment-friendly disposal of widespread sports articles

- Setting up a system for collecting and recycling sports equipment (when the necessary prerequisites exist)
- No more depiction by the sports article industry (manufacturers and outlets) of environmentally damaging sports activities in their communication with consumers (advertising, PR etc.)
- Setting up functional environmental management systems in companies in the sports equipment sector
- Spreading information on environmentally sound sport via sports dealers

Environmental Education

Due to the speed at which our natural basis of life is changing, environmental education has become one of the major future tasks of mankind. As far back as 1977, UNESCO declared that environmental education should be an all-embracing, life-long process which actively involves individuals in the solution of specific problems. In sport too, the importance of the "future task of environmental education" is now undisputed.

Avoiding and reducing sports-related environmental damage requires the active involvement of those who pursue sports activities. Environmental education should both encourage environment-friendly attitudes and habits among people doing sports and ensure that planning and legal measures for the protection of the environment are widely accepted by generating understanding among people doing sport. Environmental issues have now become part of the curricula of numerous sports organisations.

The purpose of environment-related basic and further training of, for example, instructors and coaches, is intended to lend more weight to environmental education, also as part of the normal work of clubs and associations. The same purpose is being pursued by producing and disseminating information material among club and association members.

Although they represent only a certain proportion of the people pursuing sports activities, sports organisations carry special responsibility as far as environmental education is concerned. They should not only initiate environmental education processes, even reaching beyond the circle of their actual members, but should also be willing to impose constraints upon themselves and to respect limits. Sports associations and clubs and each individual instructor, coach and supervisor should also set an example with respect to ecological issues.

Environmental education is one important approach towards resolving and avoiding conflicts between environment and sport, but is insufficient on its own. More attention should be paid to the fact that educational effects can be produced by the structure and framework within which the respective sports activity is pursued.

Thus, information and education should in future be complemented by the creation of conditions which encourage environment friendly behaviour. There is a wide variety of opportunities here, including obliging members to share lifts for away matches, providing containers for waste separation or installing safe facilities for parking bicycles.

To summarise, the following steps are especially important for future, successful environmental education in sport:

- Drawing up and implementing to a greater extent overall concepts for environmental education in which theory and practice are closely linked
- Putting in place the necessary structures for ensuring adequate and high-quality environmental education
- Testing models for influencing the environmental behaviour of non-organised sportsmen and sportswomen
- Holding environment-related competitions in sports
- Developing and implementing models for sport compatible with nature and the environment
- Anchoring environmental communication more firmly in the work of associations and clubs and in the dialogue with broad sections of the population

SUMMARY AND OUTLOOK

Sport can make its own important contribution towards bringing about the model of sustainable development and thus to the implementation of Agenda 21 in all countries. To achieve this, sports organizations and others involved in sport must discuss this model intensively and anchor it firmly in their work. Rising numbers of users and the greater and more intense use of nature and resources (land, energy, water etc.) have undeniably increased the damage to nature and the environment by sport.

At the same time, however, the range of strategies and measures for avoiding and resolving conflicts between sport and nature conservation and environmental protection, is broader than often recognized. The coordinated combination of planning, educational and legal measures promises to be particularly successful. In the case of nature-based sports, emphasis should be placed in the future on developing differentiated concepts for conservation and utilization with regard to nature and landscape; these concepts should involve the adaptation of the type of sport to the features of the natural area.

Vulnerable areas should be kept free of harmful activities and sports activities should be shifted to less vulnerable but nonetheless attractive landscape. Legal measures should only be taken if the protection objective so requires and other mechanisms do not function. In built-up areas, the priority is to retain and expand areas near homes for the purpose of physical activity, games and sport. A town offering a good quality of life must offer ample scope for physical activity.

When sports facilities are built and operated, attention must be paid to the careful and rational use of resources. In the case of existing sports facilities, it appears that the potential for reducing energy and water consumption is not yet exhausted. In the process of planning and setting up new sports facilities, environmental factors should be ranked higher than in the past. Sport is responsible for a significant proportion of all leisure traffic.

Shortening necessary routes by providing facilities near homes is thus an important starting point for bringing about changes. So far, the main means of transport for those involved in sports has been the car. The environmental damage caused by this is often underestimated. It is therefore extremely important to develop and increase the popularity of more environment-friendly forms of mobility. Today, sports articles only very rarely satisfy the conditions for ecological product design.

Thus it is hardly possible to achieve closed substance cycles. As closed substance cycle management is a central element of sustainable development, it is also necessary to make changes in this field. In the search for solutions all parties involved must cooperate. This concerns above all sports and nature conservation, commercial sports, politics and administration, trade and industry.

Without the constructive collaboration of these groups, it will hardly be possible to find effective and generally accepted solutions. It is vital that the group concerned in each case become involved at an early stage in the search for solutions to the conflict. However, the active participation of each individual person pursuing sports activities is also necessary. Thus environment-related information campaigns among people doing sport should be continued and, where appropriate, expanded.

NEED OF ENVIRONMENT IN PHYSICAL EDUCATION PROGRAMME

Physical Education is one of the important ways to improve sports environment. The Physical Education professional can play the main and important role improving sports environment. They should provide theoretical and practical knowledge of Physical Education and Sports so that children learn more and interest for sports and games be created. This will increase participation and will help in improving sports environment in the school.

Role of individual in improvement of environment for health promotion and prevention of sports related accidents. The individual can be a player, the captain of the team or sports captain of the school. They can motivate other students to play and participate in the games and sports by telling them the benefits of sports. Because motivation by peer group can be a real source of energy for improving sports environment. In this the Physical Education Teachers and Trainers/ Coaches play a very important role.

They shall see that there is no obstacle in the ground. The ground is neat, clean and leveled. The equipment must be safe. The training should be done in an organized manner. Extra attention should be given to injury oriented sports like Cricket, Hockey, Football, Archery, Javelin Throw, Discus Throw, Shot-put etc. The most important is not to leave students unattended. The Physical Education Teacher should be there to provide help at the time of injury or accident that may happen during the game.

2

Physical Fitness

MEANING AND IMPORTANCE OF PHYSICAL FITNESS

MEANING

Physical fitness comprises two related concepts: general fitness and specific fitness. Physical fitness is generally achieved through exercise, correct nutrition and enough rest. It is an important part of life. In previous years, fitness was commonly defined as the capacity to carry out the day's activities without undue fatigue.

However, as automation increased leisure time, changes in lifestyles following the industrial revolution rendered this definition insufficient. These days, physical fitness is considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypokinetic diseases, and to meet emergency situations.

IMPORTANCE OF PHYSICAL FITNESS

Physical fitness is one of the most important things in life and one of the most valuable assets one can ever have. Health is one of the pre-requisites for a happy, well-balanced life.

There are several advantages of being physically fit; here is how physical fitness helps you in the long run:

- *Cardiovascular Endurance:* Cardiovascular endurance is nothing but the measurement of your heart's strength. It also implies the ability of the body to deliver oxygen and nutrients to tissues and to remove wastes. Physical fitness helps you achieve cardiovascular endurance and helps to increase the oxygen flow to all the body muscles.
- *Muscular Strength:* A balanced and regular fitness regimen helps to increase the ability of muscles to exert force and sustain contraction. In short, to put it simply – a regular workout will make your muscles stronger and thus, increase your overall strength.
- *Self Confidence:* When you look good and you feel good – it is obvious that you have no inhibitions and insecurities to bog you down. A healthy mind and a healthy body are a big boost to your self-confidence.
- *Flexibility:* A regular workout session will ensure that you move your joints and muscles to their fullest extent and hence, it will increase the flexibility of these joints and your overall body. Flexibility in body movements is achieved only through physical fitness.
- *Body Composition:* One of the indicators of physical fitness is a balanced and healthy body composition. Minimum of fat and maximum of lean mass is a sign of a healthy and fit body. The lean mass includes muscles, bones, vital tissues and organs.
- *Beautiful You:* Exercise and overall fitness helps you detoxify your body and thus lets your skin breathe. It also helps to tone your body and thus enhances your overall appearance. So in short physical fitness keeps you beautiful and glowing.

- *Healthy Mind:* A healthy mind dwells in a healthy body. Any exercise included in your fitness regimen, will lead to the production of endorphins in the body. Endorphins are chemicals that make you feel happy and hence a healthy, physically fit body is always accompanied by a healthy mind.
- *Drive-away Illness:* Yes, it is true. Moderated and balanced workout in a fitness regimen helps to boost the immune system of the body. Fully functional and strong body immunity means that your body develops the strength to ward off diseases and infections.

So, in short, to have sense of satisfaction in your life – it is not just the materialistic things that you need – it is your own physical fitness, which will help you in the long run. A disease-free healthy body and mind are simply priceless! So what if you can earn big bucks by ignoring your health? What would you do with all the money, if you were not physically fit to enjoy its benefits? So, the next time you skip breakfast to rush to office or don't find the time to exercise owing to your busy schedules – think about this. Live your life to the fullest, but more importantly, live it wisely and invest time in your own health.

COMPONENTS AND TYPES OF PHYSICAL FITNESS

COMPONENTS OF PHYSICAL FITNESS

Physical fitness is the ability to function effectively throughout your workday, perform your usual other activities and still have enough energy left over to handle any extra stresses or emergencies which may arise.

The components of physical fitness are:

- *Cardiorespiratory endurance:* The efficiency with which the body delivers oxygen and nutrients needed for muscular activity and transports waste products from the cells.

- *Muscular strength*: The greatest amount of force a muscle or muscle group can exert in a single effort.
- *Muscular endurance*: The ability of a muscle or muscle group to perform repeated movements with a sub-maximal force for extended periods of times.
- *Flexibility*: The ability to move the joints or any group of joints through an entire, normal range of motion.
- *Body composition*: The percentage of body fat a person has in comparison to his or her total body mass.

Improving the first three components of fitness listed above will have a positive impact on body composition and will result in less fat. Excessive body fat detracts from the other fitness components, reduces performance, detracts from appearance, and negatively affects your health. Factors such as speed, agility, muscle power, eye-hand coordination, and eye-foot coordination are classified as components of "motor" fitness.

These factors most affect your athletic ability. Appropriate training can improve these factors within the limits of your potential. A sensible weight loss and fitness programme seeks to improve or maintain all the components of physical and motor fitness through sound, progressive, mission specific physical training.

PRINCIPLES OF EXERCISE

Adherence to certain basic exercise principles is important for developing an effective programme. The same principles of exercise apply to everyone at all levels of physical training, from the Olympic-calibre athlete to the weekend jogger.

These basic principles of exercise must be followed:

- *Regularity*: To achieve a training effect, you must exercise often. You should exercise each of the first four fitness components at least three times a week. Infrequent exercise can do more harm than good. Regularity is also important in resting, sleeping, and following a sensible diet.

- *Progression*: The intensity and/or duration of exercise must gradually increase to improve the level of fitness.
- *Balance*: To be effective, a programme should include activities that address all the fitness components, since overemphasizing any one of them may hurt the others.
- *Variety*: Providing a variety of activities reduces boredom and increases motivation and progress.
- *Specificity*: Training must be geared towards specific goals. For example, people become better runners if their training emphasizes running. Although swimming is great exercise, it does not improve a 2-mile-run time as much as a running programme does.
- *Recovery*: A hard day of training for a given component of fitness should be followed by an easier training day or rest day for that component and/or muscle group(s) to help permit recovery. Another way to allow recovery is to alternate the muscle groups exercised every other day, especially when training for strength and/or muscle endurance.
- *Overload*: The work load of each exercise session must exceed the normal demands placed on the body in order to bring about a training effect.

TYPES OF PHYSICAL FITNESS

Aerobic Fitness



Any exercise that raises your heart rate for an extended period of time will improve your aerobic fitness level.

If you want to improve your:

- Heart health
- Muscular endurance
- Energy level
- Mood
- Self-esteem

And/or decrease your:

- Risk of heart disease
- Blood pressure
- Cholesterol levels
- Blood sugar
- Risk of diabetes
- Body fat
- Anxiety or depression
- Fatigue
- Risk of some types of cancer

Make aerobic exercise a regular part of your fitness programme.

How much should you do

Health and fitness experts recommend doing a minimum of 2 1/2 hours of moderate intensity or 1 1/4 hours of high intensity activity per week. It's OK to break it up into 10 or 15 minute increments. What's moderate intensity? Moderate activity includes things like brisk walking and biking as well as daily activities such as mowing the lawn or vacuuming that raise your heart rate for at least 10 minutes continuously. You feel a little warm and are able to talk while you exercise. If you try to sing it's difficult.

You are working at 65 per cent-74 per cent of your maximum heart rate during moderate activity. High intensity includes activities such as running or jogging, biking faster than 12 mph, hiking hills and cross country skiing. You break

a sweat, your breathing is more laboured but you can still talk. Your heart rate is beating at 75 per cent - 85 per cent of its maximum during a high intensity workout. You can choose to do either moderate or high intensity workouts or any combination of the two depending on your fitness level. Learning your target heart rate range and wearing a heart rate monitor is a relatively inexpensive and easy way to be sure of what intensity of workout you are doing.

Always warm up for at least 5 minutes first and include some stretching exercises at the end of your workout. If you are new to exercise check with your doctor. Start with low intensity workouts (55 per cent - 64 per cent of maximum heart rate) of shorter durations. Then increase your time or intensity (not both at once) by 10 per cent per week. Try different types of activities until you find ones you enjoy.

Here are some other ways to get an aerobic workout:

- Aerobic classes such as step, spinning and water aerobics
- Swimming
- Racket sports
- Playing basketball or volleyball
- walking the dog, sweeping the floor, carrying heavy loads (as long as they are done for at least 10 minutes continuously)

Muscle Fitness



There are two components to muscle fitness. The ability to lift heavy objects (strength) and the ability work for long periods before fatiguing (endurance). Muscle fitness is achieved by exercising against resistance. This creates small tears in the muscle tissue. After you workout your muscle tissue repairs itself thereby becoming stronger. To allow time for this repair process to happen allow at least one day off in between strength training workouts of the same area.

If your goal is to improve:

- Your metabolism
- Your bone mineral density
- Your lean muscle mass
- Your ability to lift and carry things
- Your ability to get up and down from a chair or the floor
- Confidence

And/or your want to decrease your:

- Body fat
- Fatigue
- Age-related muscle loss
- Risk of osteoporosis
- Risk of injury
- Blood sugar
- Blood pressure
- Pain

Make strength training one of the types of physical fitness you do.

There are a number of ways to strength train:

- Lifting free weights
- Lift your body weight as in a push up or squat
- Workout on machines
- Use exercise bands or tubes
- Make use of aquatic exercise equipment

- Doing tasks such as vacuuming or pushing a lawnmower
- Doing core stabilization exercises - strengthening the muscles of your trunk

It's important to find a form of strength training that you enjoy. General guidelines for strength training: workout 2 to 3 times a week with a routine that uses all the major muscle groups in your chest, shoulders, back, abs, arms and legs. A basic strength training programme should take 20 - 30 minutes to do. Whether you do more than that depends on your goals. Plan to be a little sore for the first few weeks, but don't produce pain during or after your workouts. It's very important to learn proper form so work with a certified personal trainer for a few sessions to start.

Flexibility Fitness



If you are able to move your muscles and joints through full range of motion easily you have flexibility fitness. This is one of the types of physical fitness that often gets overlooked. Everyone should do exercises or movements to stay flexible on a daily basis.

Having good flexibility is very important in:

- Preventing injury to any area of the body
- Decreasing pain
- Increasing your energy level
- Maintaining independence as you age. Such as being able to bend and tie your shoes, pick up items from the floor or turn your head to shoulder check while driving.
- Maintaining good balance and coordination

We lose a flexibility slowly over time and may not even notice until we make a simple move and wind up hurting ourselves. Maintain your flexibility by stretching all your major muscle groups on a daily basis. This includes your neck, back, abs, shoulders, hips, thighs and calves. A basic stretching programme should take no more than 10 minutes per day. You don't have to do it all at once.

It's good to warm up briefly before you stretch. Make sure not to bounce or push to pain while stretching. When you reach a position where you feel a slight pull hold it for 30 seconds. If you have any musculoskeletal problems a physical therapist can help design a flexibility programme to meet your needs. Women with osteoporosis should learn the precautions for this condition.

For fun ways to stretch consider:

- Yoga
- Tai chi
- Pilates
- Participating in a martial arts class

If you are just starting out, begin slowly with easy poses and lower hold times (10 seconds). Progress gradually.

BALANCE FITNESS



If you feel at all unsteady you may be unfit when it comes to having good balance. We tend to lose our balance a little at a time as we age. The more inactive your lifestyle the more likely you will develop balance issues. Wondering just how fit your balance is? Try standing on one leg with the other foot off the ground. (Have someone with you if you've been feeling

unsteady). Time how long you can stay in this position before having to put your foot down. Holding for 21 seconds is considered normal for women 50 - 59 years old. 10 seconds is good if you are between 60 and 69 years of age. For women over 70 average balance is maintaining the position for 4 seconds. If you can't do the one leg stand at all you are at greater than average risk of having a fall. Falling is the most common cause of injury in people over 60 according to the center for disease control.

If you scored average for your age you can maintain your balance by:

- Doing yoga
- Practicing Tai Chi
- Working out on exercise balls
- Dancing
- Doing simple balance exercises at home on your own

Staying active with aerobic exercise and strength training also helps maintain balance.

FACTORS AFFECTING PHYSICAL FITNESS

Most common factors are:

- Regularity
- Diet
- Environment
- Heredity
- Age and sex
- Stress and tension
- Proper training
- Intoxicants (alcohol, drugs etc.)
- Rest and relaxation
- Health problems

3

Sport Psychology

INTRODUCTION

Sport psychology is the study of a person's behaviour in sport. It is also a specialization within the brain psychology and kinesiology that seeks to understand psychological/mental factors that affect performance in sports, physical activity, and exercise and apply these to enhance individual and team performance.

It deals with increasing performance by managing emotions and minimizing the psychological effects of injury and poor performance. Some of the most important skills taught are goal setting, relaxation, visualization, self-talk, awareness and control, concentration, confidence, using rituals, attribution training, and periodization.

THE 4C'S

Concentration, confidence, control and commitment (the 4C's) are generally considered the main mental qualities that are important for successful performance in most sports.

- *Concentration:* Ability to maintain focus
- *Confidence:* Believe in one's abilities
- *Control:* Ability to maintain emotional control regardless of distraction

- *Commitment*: Ability to continue working to agreed goals

The techniques of relaxation, centering and mental imagery can assist an athlete to achieve the 4C's.

Concentration

This is the mental quality to focus on the task in hand. If the athlete lacks concentration then their athletic abilities will not be effectively or efficiently applied to the task.

Research has identified the following types of attention focus:

- Broad Narrow continuum - The athlete focuses on a large or small number of stimuli
- Internal External continuum - The athlete focuses on internal stimuli or external stimuli

The demand for concentration varies with the sport:

- *Sustained concentration*: Distance running, cycling, tennis, squash
- *Short bursts of concentration*: Cricket, golf, shooting, athletic field events
- *Intense concentration*: Sprinting events, bobsleigh, skiing

Common distractions are: anxiety, mistakes, fatigue, weather, public announcements, coach, manager, opponent, negative thoughts etc. Strategies to improve concentration are very personal. One way to maintain focus is to set process goals for each session or competition. The athlete will have an overall goal for which the athlete will identify a number of process goals that help focus on specific aspects of the task.

For each of these goals the athlete can use a trigger word, for e.g., sprinting technique requires the athlete to focus on being tall, relaxed, smooth and to drive with the elbows - trigger word could be "technique" Athletes will develop a routine for competition that may include the night before, the morning, pre-competition, competition and post competition routines. If these routines are appropriately structured then they can prove a useful aid to concentration.

Confidence

Confidence results from the comparison an athlete makes between the goal and their ability. The athlete will have self-confidence if they believe they can achieve their goal.. When an athlete has self confidence they will tend to: persevere even when things are not going to plan, show enthusiasm, be positive in their approach and take their share of the responsibility in success and fail.

To improve their self confidence, an athlete can use mental imagery to:

- Visualise previous good performance to remind them of the look and feel
- Imagine various scenarios and how they will cope with them

Control

Identifying when an athlete feels a particular emotion and understanding the reason for the feelings is an important stage of helping an athlete gain emotional control. An athlete's ability to maintain control of their emotions in the face of adversity and remain positive is essential to successful performance. Two emotions that are often associated with poor performance are anxiety and anger.

Anxiety comes in two forms - Physical and Mental. Relaxation is a technique that can be used to reduce anxiety. When an athlete becomes angry, the cause of the anger often becomes the focus of attention. This then leads to a lack of concentration on the task, performance deteriorates and confidence in ability is lost which fuels the anger - a slippery slope to failure.

Commitment

Sports performance depends on the athlete being fully committed to numerous goals over many years. In competition with these goals the athlete will have many aspects of daily

life to manage. The many competing interests and commitments include work, studies, family/partner, friends, social life and other hobbies/sports. Within the athlete's sport, commitment can be undermined by:

- A perceived lack of progress or improvement
- Not being sufficiently involved in developing the training programme
- Not understanding the objectives of the training programme
- Injury
- Lack of enjoyment
- Anxiety about performance - competition
- Becoming bored
- Coach athlete not working as a team
- Lack of commitment by other athletes

Setting goals with the athlete will raise their feelings of value, give them joint ownership of the goals and therefore become more committed to achieving them. All goals should be SMARTER. Many people (coach, medical support team, manager, friends, etc.) can contribute to an athlete's levels of commitment with appropriate levels of support and positive feedback, especially during times of injury, illness and poor performance.

SUCCESSFUL EMOTIONAL STATES

The following are emotional states experienced with successful performance:

- *Happy:* Felt that this was my opportunity to demonstrate an excellent performance. Felt I could beat anybody.
- *Calm and nervous:* Felt nervous but really at ease with these feelings. I accepted and expected to be nervous but felt ready to start.
- *Anxious but excited:* Felt so ready to compete but a little nervous. Nerves and excitement come together

- *Confident*: I remembered all the successful training sessions and previous best performances

PSYCHOLOGY SKILLS TRAINING

Training for the athlete should aim to improve their mental skills, such as self-confidence, motivation, the ability to relax under great pressure, and the ability to concentrate and usually has three phases:

- Education phase, during which athletes learn about the importance of psychological skills and how they affect performance
- Acquisition phase, during which athletes learn about the strategies and techniques to improve the specific psychological skills that they require
- Practice phase, during which athletes develop their psychological skills through repeated practice, simulations, and actual competition

GOAL SETTING

Goal Setting involves establishing specific, measurable and time-targeted objectives. The ideal - taught - is a disposition that causes an intrinsic drive to be delivered in a professional manner. The parameters of professionalism indicate a time continuum – without continuity – but exhaustion and anxiety: an irony.

It is a conundrum out mania, to cause professionals to work backward in order to get to the ultimate goal. It is without faith, but grander thought in moments of observation in hopes to serve need; whether it be self or others. As goal-setters, time-targets become real and more so sensational as the end draws near — a sense of urgency falls afoot.

The time is precise and specific; in which is set by the goal-setter. Goal setting is a major component of personal development literature. Compulsions, fantasy and dreams that serve an observed inequity - or perhaps it is a personal bout

against inequity - is the cause of personality; which can be determined by the value one puts on extrinsic and intrinsic drives usually defined by the individual or goal-setter.

Many times the definition of goal-setting comes from free literary expression that serves a needed fulfilment of goals one must fulfil to become satisfied. This expression - written - may bring to hindsight a goal grander that must be made to self in order to fulfil that need, and even desire. At times satisfaction may come from serving others, and at times it comes from serving the self as a result of personal development.

It is true that one can not identify another as being like them; for the other has distinctive traits, skills and abilities as a result of individual sovereignty attributed to individual development. It may be difficult to warrant the cause, but it is not difficult to warrant the need when under marginal disillusionment one becomes focused again. What may come to hindsight as a result of sovereignty is relative according to each individual.

In other words: goals are different from person to person. Effective goals should be tangible, specific, realistic and have a time targeted for completion. There must be realistic plans to achieve the intended goal. For example, setting a goal to go to Mars on a shoe string budget is not a realistic goal, while setting a goal to go to Hawaii as a backpacker is a possible goal with possible, realistic plans. In setting goals that are unrealistic - one may never obtain - loses any sort satisfaction; therefore can not continue on the goal setter's path.

This path may come to an end abruptly; for it can not be achieved before one's own lifetime. However setting one's mark on the children of tomorrow may bring hope beyond the mania of unattainable goals for one person. Realistically, goals are persistent of an individual's intrinsic drives designed by their general environment - defining socialization. Of course in a group environment - where two minds are better than one - goals can be obtained much quicker.

Work on the theory of goal-setting suggests that it's an effective tool for making progress by ensuring that participants in a group with a common goal are clearly aware of what is

expected from them if an objective is to be achieved. On a personal level, setting goals is a process that allows people to specify then work towards their own objectives - most commonly with financial or career-based goals.

However, some say that much of what is currently taught about goal setting is incomplete. Prominent speakers on goal setting such as Jim Rohn or Zig Ziglar have suggested that goal setting is more than writing something down, setting a date and working towards that end. In order to make the success or achievement a lasting value the person must become something different in the process. There are significant differences in how a person accomplishes a "be" goal versus a "Have" goal.

Some people feel that one possible drawback of goal setting is that implicit learning may be inhibited. This is because goal setting may encourage simple focus on an outcome without openness to exploration, understanding or growth. "Goals provide a sense of direction and purpose". Locke et al. examined the behavioural effects of goal-setting, concluding that 90 per cent of laboratory and field studies involving specific and challenging goals led to higher performance than easy or no goals.

In business, goal setting has the advantages of encouraging participants to put in substantial effort; and, because every member has defined expectations set upon him or her (high role perception), little room is left for inadequate effort going unnoticed. While some managers would believe it is sufficient to urge employees to 'do their best', Locke and Latham have a clear contradicting view on this. The authors state that people who are told to 'do their best' will not do so.

'Doing your best' has no external referent which implies that it is useless in eliciting specific behaviour. To elicit some specific form of behaviour from others, it is important that this person has a clear view of what is expected from him/her. A goal is thereby of vital importance because it facilitates an individual in focusing their efforts in a specified direction. In other words; goals canalize behaviour. However when goals are established at a management level and thereafter solely laid down, employee motivation with regard to achieving these goals is rather suppressed.

In order to increase motivation the employees not only need to be allowed to participate in the goal setting process but the goals have to be challenging as well. Managers cannot be constantly able to drive motivation and keep track of an employee's work on a continuous basis. Goals are therefore an important tool for managers since goals have the ability to function as a self-regulatory mechanism that acquires an employee a certain amount of guidance have distilled four mechanisms through which goal setting is able to affect individual performance:

- Goals focus attention towards goal-relevant activities and away from goal-irrelevant activities.
- Goals serve as an energizer; higher goals will induce greater effort while low goals induce lesser effort.
- Goals affect persistence; constraints with regard to resources will affect work pace.
- Goals activate cognitive knowledge and strategies which allows employees to cope with the situation at hand.

Through an understanding of the effect of goal setting on individual performance organizations are able to use goal setting to benefit organizational performance. Have therefore indicated three moderators which indicate the success of goal setting:

- *Goal commitment*: People will perform better when they are committed to achieve certain goals. Goal commitment is dependent of:
 - The importance of the expected outcomes of goal attainment and;
 - Self-efficacy - one's belief that they are able to achieve the goals;
 - Commitment to others - promises or engagements to others can strongly improve commitment.
- *Feedback*: Keep track of performance to allow employees to see how effective they have been in

attaining the goals. Without proper feedback channels it is impossible to adapt or adjust to the required behaviour.

- *Task complexity*: More difficult goals require more cognitive strategies and well developed skills. The more difficult the tasks ahead, a smaller group of people will possess the necessary skills and strategies. From an organizational perspective it is thereby more difficult to successfully attain more difficult goals since resources become more scarce.
- *Employee motivation*: The more employees are motivated, the more they are stimulated and interested in accepting goals.
- *Macro-economical characteristics*: The position of the economy in the conjuncture puts pressure or simply relieves the organization. This means that some goals are easier set in specific macro-economical surroundings. Depression is for instance the least successful conjunctural phase for goal setting.

These success factors are not to be seen independently. For example the expected outcomes of goals are positively influenced when employees are involved in the goal setting process. Not only does participation increase commitment in attaining the goals that are set, participation influences self-efficacy as well. In addition to this feedback is necessary to monitor one's progress. When this is left aside, an employee might think (s)he is not making enough progress. This can reduce self-efficacy and thereby harm the performance outcomes in the long run.

PERSONAL GOAL SETTING

Goal setting is a powerful process for thinking about your ideal future, and for motivating yourself to turn this vision of the future into reality. The process of setting goals helps you choose where you want to go in life. By knowing precisely what you want to achieve, you know where you have to

concentrate your efforts. You'll also quickly spot the distractions that would otherwise lure you from your course. More than this, properly-set goals can be incredibly motivating, and as you get into the habit of setting and achieving goals, you'll find that your self-confidence builds fast.

Achieving More With Focus

Goal setting techniques are used by top-level athletes, successful business-people and achievers in all fields. They give you long-term vision and short-term motivation. They focus your acquisition of knowledge and help you to organize your time and your resources so that you can make the very most of your life. By setting sharp, clearly defined goals, you can measure and take pride in the achievement of those goals. You can see forward progress in what might previously have seemed a long pointless grind. By setting goals, you will also raise your self-confidence, as you recognize your ability and competence in achieving the goals that you have set.

Starting to Set Personal Goals

Goals are set on a number of different levels: First you create your "big picture" of what you want to do with your life, and decide what large-scale goals you want to achieve. Second, you break these down into the smaller and smaller targets that you must hit so that you reach your lifetime goals. Finally, once you have your plan, you start working to achieve it.

Key Points

Goal setting is an important method of:

- Deciding what is important for you to achieve in your life.
- Separating what is important from what is irrelevant, or a distraction.
- Motivating yourself.
- Building your self-confidence, based on successful achievement of goals.

If you don't already set goals, do so, starting now. As you make this technique part of your life, you'll find your career accelerating, and you'll wonder how you did without it.

STRESS MANAGEMENT

A lot of research has been conducted into stress over the last hundred years. Some of the theories behind it are now settled and accepted; others are still being researched and debated. During this time, there seems to have been something approaching open warfare between competing theories and definitions: Views have been passionately held and aggressively defended. What complicates this is that intuitively we all feel that we know what stress is, as it is something we have all experienced. A definition should therefore be obvious...except that it is not.

DEFINITIONS

Hans Selye was one of the founding fathers of stress research. His view in 1956 was that "stress is not necessarily something bad – it all depends on how you take it. The stress of exhilarating, creative successful work is beneficial, while that of failure, humiliation or infection is detrimental." Selye believed that the biochemical effects of stress would be experienced irrespective of whether the situation was positive or negative.

Since then, a great deal of further research has been conducted, and ideas have moved on. Stress is now viewed as a "bad thing", with a range of harmful biochemical and long-term effects. These effects have rarely been observed in positive situations. The most commonly accepted definition of stress is that stress is a condition or feeling experienced when a person perceives that "demands exceed the personal and social resources the individual is able to mobilize."

In short, it's what we feel when we think we've lost control of events. This is the main definition used by this section of Mind Tools, although we also recognize that there is an

intertwined instinctive stress response to unexpected events. The stress response inside us is therefore part instinct and part to do with the way we think.

FIGHT-OR-FLIGHT

Some of the early research on stress established the existence of the well-known “fight-or-flight” response. His work showed that when an organism experiences a shock or perceives a threat, it quickly releases hormones that help it to survive. In humans, as in other animals, these hormones help us to run faster and fight harder. They increase heart rate and blood pressure, delivering more oxygen and blood sugar to power important muscles.

They increase sweating in an effort to cool these muscles, and help them stay efficient. They divert blood away from the skin to the core of our bodies, reducing blood loss if we are damaged. As well as this, these hormones focus our attention on the threat, to the exclusion of everything else. All of this significantly improves our ability to survive life-threatening events. Not only life-threatening events trigger this reaction: We experience it almost any time we come across something unexpected or something that frustrates our goals.

When the threat is small, our response is small and we often do not notice it among the many other distractions of a stressful situation. Unfortunately, this mobilization of the body for survival also has negative consequences. In this state, we are excitable, anxious, jumpy and irritable. This actually reduces our ability to work effectively with other people. With trembling and a pounding heart, we can find it difficult to execute precise, controlled skills.

The intensity of our focus on survival interferes with our ability to make fine judgements by drawing information from many sources. We find ourselves more accident-prone and less able to make good decisions. There are very few situations in modern working life where this response is useful.

Most situations benefit from a calm, rational, controlled and socially sensitive approach. In the short term, we need to

keep this fight-or-flight response under control to be effective in our jobs. In the long term we need to keep it under control to avoid problems of poor health and burnout.

MANAGING STRESS

There are very many proven skills that we can use to manage stress. These help us to remain calm and effective in high pressure situations, and help us avoid the problems of long term stress. In the rest of this section of Mind Tools, we look at some important techniques in each of these three groups. Keeping a Stress Diary or carrying out the Burnout Self-Test will help you to identify your current levels of stress, so you can decide what action, if any, you need to take.

Job Analysis and Performance Planning will help you to get on top of your workload. While the emotionally-oriented skills of Imagery, Physical Techniques and Rational Positive Thinking will help you change the way you see apparently stressful situations. Finally, the article on Anger Management will help you to channel your feelings into performance. This is a much-abridged excerpt from the 'Understanding Stress and Stress Management' module of the Mind Tools Stress Management Masterclass.

As well as covering this material in more detail, it also discusses:

- Long-term stress: The General Adaptation Syndrome and Burnout
- The Integrated Stress Response
- Stress and Health
- Stress and its Affect on the Way We Think
- Pressure and Performance: Flow and the 'Inverted-U'

These sections give you a deeper understanding of stress, helping you to develop your own stress management strategies for handling unique circumstances. MindTools.Com site, which has many more articles on stress management. The first of these articles shows you how to keep a stress diary - an important technique for understanding the most important sources of stress in your life.

PERFORMANCE PLANNING

We all know the feeling of sickness in our stomach before an important presentation or performance. We have all experienced the sweaty palms, the raised heart rate, and the sense of agitation that we feel as these events approach. We have probably all also experienced how much worse this becomes when things go wrong in the run up to an event. This article helps you deal with this by helping you to prepare well for future performances.

The Thought Awareness, Rational Thinking and Positive Thinking technique that we look at later may be enough to help you manage the fears, anxieties and negative thoughts that may arise in a small performance. For larger events, it is worth preparing a Performance Plan. This is a pre-prepared plan that helps you to deal effectively with any problems or distractions that may occur, and perform in a positive and focused frame of mind.

HOW TO USE THE TOOL

To prepare your Performance Plan, begin by making a list all of the steps that you need to do from getting prepared for a performance through to its conclusion. Start far enough in advance to sort out any equipment problems.

List all of the physical and mental steps that you need to take to:

- Prepare and check your equipment, and repair or replace it where it does not work;
- Make travel arrangements;
- Pack your equipment and luggage;
- Travel to the site of your performance;
- Set up equipment;
- Wait and prepare for your performance; and
- Deliver your performance.

Next, work through each of these steps. Think though:

- Everything that could reasonably go wrong at each step with equipment and arrangements;

- Any distractions and negative thinking that could undermine your confidence or stop you having a positive, focused frame of mind at the start of and during your performance.

Work through all of the things that could go wrong. Look at the likelihood of the problem occurring. Many of the things you have listed may be extremely unlikely. Where appropriate, strike these out and ignore them from your planning. Look at each of the remaining contingencies.

These will fall into three categories:

- Things you can eliminate by appropriate preparation, including making back-up arrangements and acquiring appropriate additional or spare equipment;
- Things you can manage by avoiding unnecessary risk;
- Things you can manage with a pre-prepared action or with an appropriate stress management technique

For example, if you are depending on using a data projector for a presentation, you can arrange for a back up projector to be available, purchase a replacement bulb, and/or print off paper copies of the presentation in case all else fails. You can leave earlier than strictly necessary so that you have time for serious travel delays. You can also think through appropriate alternatives if your travel plans are disrupted. If you are forced to wait before your event in an uncomfortable or unsuitably distracting place, prepare the relaxation techniques you can use to keep a calm, positive frame of mind.

Research all of the information you will need to take the appropriate actions quickly, and ensure that you have the appropriate resources available. Also, prepare the positive thinking you will use to counter fears and negative thoughts both before the event and during it. Use stress anticipation skills to ensure that you are properly prepared to manage stress. Then use thought awareness, rational thinking and positive thinking skills to prepare the positive thoughts that you will use to protect and build your confidence.

Write your plan down on paper in a form that is easy to read and easy to refer to. Keep it with you as you prepare for, and deliver, your performance. Refer to it whenever you need it in the time leading up to the event, and during it. Performance Plans help you to prepare for an important performance. They bring together practical contingency planning with mental preparation to help you prepare for situations and eventualities that may realistically occur.

This gives you the confidence that comes from knowing you are as well prepared for an event as is practically possible to be. It also helps you to avoid the unpleasant stresses that come from poor preparation, meaning that you can deliver your performance in a relaxed, positive and focused frame of mind, whatever problems or upsets may have occurred.

This article is an abridged version of just one of the techniques used to manage performance stress explained in “Managing Stress for Career Success”, Mind Tools’ Stress Management Masterclass. The ‘Managing Performance Stress’ module explains how to prepare for the event, how to manage negative thinking leading up to it and how to learn lessons from your experience of stress. As well as this, it shows you how to use a range of useful adrenaline management techniques for controlling the anxiety you will inevitably feel just before your performance.

IMAGERY

Sometimes we are not able to change our environment to manage stress – this may be the case where we do not have the power to change a situation, or where we are about to give an important performance. Imagery is a useful skill for relaxing in these situations. Imagery is a potent method of stress reduction, especially when combined with physical relaxation methods such as deep breathing.

You will be aware of how particular environments can be very relaxing, while others can be intensely stressful. The principle behind the use of imagery in stress reduction is that you can use your imagination to recreate and enjoy a situation

that is very relaxing. The more intensely you imagine the situation, the more relaxing the experience will be. This sounds unlikely. In fact, the effectiveness of imagery can be shown very effectively if you have access to biofeedback equipment. By imagining a pleasant and relaxing scene you can objectively see the measured stress in your body reduce. By imagining an unpleasant and stressful situation, you can see the stress in your body increase. This very real effect can be quite alarming when you see it happen the first time.

How to use the tool:

- Two situations where imagery can be very effective are when you're trying to relax and when you're preparing or rehearsing for a performance.

Imagery in Relaxation

One common use of imagery in relaxation is to imagine a scene, place or event that you remember as safe, peaceful, restful, beautiful and happy. You can bring all your senses into the image with, for example, sounds of running water and birds, the smell of cut grass, the taste of cool white wine, the warmth of the sun, etc. Use the imagined place as a retreat from stress and pressure. Scenes can involve complex images such as lying on a beach in a deserted cove.

You may "see" cliffs, sea and sand around you, "hear" the waves crashing against rocks, "smell" the salt in the air, and "feel" the warmth of the sun and a gentle breeze on your body. Other images might include looking at a mountain view, swimming in a tropical pool, or whatever you want. You will be able to come up with the most effective images for yourself. Other uses of imagery in relaxation involve creating mental pictures of stress flowing out of your body, or of stress, distractions and everyday concerns being folded away and locked into a padlocked chest.

Imagery in Preparation and Rehearsal

You can also use imagery in rehearsal before a big event, allowing you to run through the event in your mind. Aside from allowing you to rehearse mentally, imagery also allows

you to practice in advance for anything unusual that might occur, so that you are prepared and already practice in handling it. This is a technique used very commonly by top sports people, who learn good performance habits by repeatedly rehearsing performances in their imagination.

When the unusual eventualities they have rehearsed using imagery occur, they have good, pre-prepared, habitual responses to them. Imagery also allows you to pre-experience achievement of your goals, helping to give you the self-confidence you need to do something well. This is another technique used by successful athletes. With imagery, you substitute actual experience with scenes from your imagination.

Your body reacts to these imagined scenes almost as if they were real, calming you down and letting adrenaline disperse. To relax with imagery, imagine a warm, comfortable, safe and pleasant place, and enjoy it in your imagination. Imagery can be shown to work by using biofeedback devices that measure body stress. By imagining pleasant and unpleasant scenes, you can actually see or hear the changing levels of stress in your body diminish.

This is an excerpt from "Managing Stress for Career Success", the Mind Tools Stress Management Masterclass. Imagery is just one of the important mental relaxation techniques that you learn with this course. Not only does the course show you how to use these techniques, it also explains the sound practical psychology that lies behind them.

PHYSICAL RELAXATION TECHNIQUES

Physical relaxation techniques are as effective as mental techniques in reducing stress. In fact, the best relaxation is achieved by using physical and mental techniques together. These three useful physical relaxation techniques can help you reduce muscle tension and manage the effects of the fight-or-flight response on your body.

This is particularly important if you need to think clearly and perform precisely when you are under pressure. The

techniques we will look at are Deep Breathing, Progressive Muscular Relaxation and "The Relaxation Response".

Deep Breathing

Deep breathing is a simple, but very effective, method of relaxation. It is a core component of everything from the "take ten deep breaths" approach to calming someone down, right through to yoga relaxation and Zen meditation. It works well in conjunction with other relaxation techniques such as Progressive Muscular Relaxation, relaxation imagery and meditation to reduce stress. To use the technique, take a number of deep breaths and relax your body further with each breath. That's all there is to it.

Progressive Muscular Relaxation

Progressive Muscular Relaxation is useful for relaxing your body when your muscles are tense. The idea behind PMR is that you tense up a group of muscles so that they are as tightly contracted as possible. Hold them in a state of extreme tension for a few seconds. Then, relax the muscles normally. Then, consciously relax the muscles even further so that you are as relaxed as possible.

By tensing your muscles first, you will find that you are able to relax your muscles more than would be the case if you tried to relax your muscles directly. Experiment with PMR by forming a fist, and clenching your hand as tight as you can for a few seconds. Relax your hand to its previous tension, and then consciously relax it again so that it is as loose as possible. You should feel deep relaxation in your hand muscles.

The Relaxation Response

'The Relaxation Response' is the name of a book published by Dr. Herbert Benson of Harvard University in 1968. In a series of experiments into various popular meditation techniques, Dr. Benson established that these techniques had a very real effect on reducing stress and controlling the fight-or-flight

response. Direct effects included deep relaxation, slowed heartbeat and breathing, reduced oxygen consumption and increased skin resistance.

This is something that you can do for yourself by following these steps:

- Sit quietly and comfortably.
- Close your eyes.
- Start by relaxing the muscles of your feet and work up your body relaxing muscles.
- Focus your attention on your breathing.
- Breathe in deeply and then let your breath out. Count your breaths, and say the number of the breath as you let it out.

Do this for ten or twenty minutes. An even more potent alternative approach is to follow these steps, but to use relaxation imagery instead of counting breaths in step 5. Again, you can prove to yourself that this works using the biofeedback equipment. "Deep Breathing," "Progressive Muscular Relaxation," and the steps leading to the "Relaxation Response" are three good techniques that can help you to relax your body and manage the symptoms of the fight-or-flight response.

These are particularly helpful for both handling nerves prior to an important performance, and reducing stress generally. This is an excerpt from "Managing Stress for Career Success", the Mind Tools Stress Management Masterclass. These physical relaxation techniques are just some of the important skills that we explain. As well as explaining relaxation techniques, the Stress Management Masterclass shows you how to take action to tackle the root causes of job stress - a side-effect of this approach is that you become more effective and successful in your career.

MOTIVATION

Motivation is the activation or energization of goal-oriented behaviour. Motivation is said to be intrinsic or

extrinsic. The term is generally used for humans but, theoretically, it can also be used to describe the causes for animal behaviour as well. This article refers to human motivation. According to various theories, motivation may be rooted in the basic need to minimize physical pain and maximize pleasure, or it may include specific needs such as eating and resting, or a desired object, hobby, goal, state of being, ideal, or it may be attributed to less-apparent reasons such as altruism, selfishness, morality, or avoiding mortality. Conceptually, motivation should not be confused with either volition or optimism.

MOTIVATION CONCEPTS

Intrinsic and Extrinsic Motivation

Intrinsic Motivation

Intrinsic motivation comes from rewards inherent to a task or activity itself - the enjoyment of a puzzle or the love of playing. This form of motivation has been studied by social and educational psychologists since the early 1970s. Research has found that it is usually associated with high educational achievement and enjoyment by students. Intrinsic motivation has been explained by Fritz Heider's attribution theory, Bandura's work on self-efficacy, and Ryan and Deci's cognitive evaluation theory.

Students are likely to be intrinsically motivated if they:

- Attribute their educational results to internal factors that they can control,
- Believe they can be effective agents in reaching desired goals,
- Are interested in mastering a topic, rather than just rote-learning to achieve good grades.

Extrinsic Motivation

Extrinsic motivation comes from outside of the performer. Money is the most obvious example, but coercion and threat

of punishment are also common extrinsic motivations. While competing, the crowd may cheer on the performer, which may motivate him or her to do well. Trophies are also extrinsic incentives.

Competition is in general extrinsic because it encourages the performer to win and beat others, not to enjoy the intrinsic rewards of the activity. Social psychological research has indicated that extrinsic rewards can lead to overjustification and a subsequent reduction in intrinsic motivation. In one study demonstrating this effect, children who expected to be rewarded with a ribbon and a gold star for drawing pictures spent less time playing with the drawing materials in subsequent observations than children who were assigned to an unexpected reward condition and to children who received no extrinsic reward.

Self-control

The self-control of motivation is increasingly understood as a subset of emotional intelligence; a person may be highly intelligent according to a more conservative definition, yet unmotivated to dedicate this intelligence to certain tasks. Yale School of Management professor Victor Vroom's "expectancy theory" provides an account of when people will decide whether to exert self control to pursue a particular goal. Drives and desires can be described as a deficiency or need that activates behaviour that is aimed at a goal or an incentive.

These are thought to originate within the individual and may not require external stimuli to encourage the behaviour. Basic drives could be sparked by deficiencies such as hunger, which motivates a person to seek food; whereas more subtle drives might be the desire for praise and approval, which motivates a person to behave in a manner pleasing to others. By contrast, the role of extrinsic rewards and stimuli can be seen in the example of training animals by giving them treats when they perform a trick correctly. The treat motivates the animals to perform the trick consistently, even later when the treat is removed from the process.

MOTIVATIONAL THEORIES

The Incentive Theory of Motivation

A reward, tangible or intangible, is presented after the occurrence of an action with the intent to cause the behaviour to occur again. This is done by associating positive meaning to the behaviour. Studies show that if the person receives the reward immediately, the effect would be greater, and decreases as duration lengthens. Repetitive action-reward combination can cause the action to become habit. Motivation comes from two sources: oneself, and other people.

These two sources are called intrinsic motivation and extrinsic motivation, respectively. Applying proper motivational techniques can be much harder than it seems. Steven Kerr notes that when creating a reward system, it can be easy to reward A, while hoping for B, and in the process, reap harmful effects that can jeopardize your goals. A reinforcer is different from reward, in that reinforcement is intended to create a measured increase in the rate of a desirable behaviour following the addition of something to the environment.

Drive-reduction Theories

There are a number of drive theories. The Drive Reduction Theory grows out of the concept that we have certain biological drives, such as hunger. As time passes the strength of the drive increases if it is not satisfied. Upon satisfying a drive the drive's strength is reduced. The theory is based on diverse ideas from the theories of Freud to the ideas of feedback control systems, such as a thermostat. Drive theory has some intuitive or folk validity.

For instance when preparing food, the drive model appears to be compatible with sensations of rising hunger as the food is prepared, and, after the food has been consumed, a decrease in subjective hunger. There are several problems, however, that leave the validity of drive reduction open for debate. The first problem is that it does not explain how secondary reinforcers reduce drive.

For example, money satisfies no biological or psychological needs, but a pay check appears to reduce drive through second-order conditioning. Secondly, a drive, such as hunger, is viewed as having a "desire" to eat, making the drive a homuncular being - a feature criticized as simply moving the fundamental problem behind this "small man" and his desires.

In addition, it is clear that drive reduction theory cannot be a complete theory of behaviour, or a hungry human could not prepare a meal without eating the food before he finished cooking it. The ability of drive theory to cope with all kinds of behaviour, from not satisfying a drive, or adding additional drives for "tasty" food, which combine with drives for "food" in order to explain cooking render it hard to test.

Cognitive Dissonance Theory

Suggested by Leon Festinger, this occurs when an individual experiences some degree of discomfort resulting from an incompatibility between two cognitions. For example, a consumer may seek to reassure himself regarding a purchase, feeling, in retrospect, that another decision may have been preferable. Another example of cognitive dissonance is when a belief and a behaviour are in conflict. A person may wish to be healthy, believes smoking is bad for one's health, and yet continues to smoke.

Need Theories

Need hierarchy theory

Abraham Maslow's theory is one of the most widely discussed theories of motivation.

The theory can be summarized as follows:

- Human beings have wants and desires which influence their behaviour. Only unsatisfied needs influence behaviour, satisfied needs do not.
- Since needs are many, they are arranged in order of importance, from the basic to the complex.

- The person advances to the next level of needs only after the lower level need is at least minimally satisfied.
- The further the progress up the hierarchy, the more individuality, humanness and psychological health a person will show.

The needs, listed from basic (lowest-earliest) to most complex (highest-latest) are as follows:

- Physiology (hunger, thirst, sleep, etc.)
- Safety/Security/Shelter/Health
- Belongingness/Love/Friendship
- Self-esteem/Recognition/Achievement
- Self actualization

Herzberg's Two-factor Theory

Frederick Herzberg's two-factor theory, AKA intrinsic/extrinsic motivation, concludes that certain factors in the workplace result in job satisfaction, but if absent, they don't lead to dissatisfaction but no satisfaction. The factors that motivate people can change over their lifetime, but "respect for me as a person" is one of the top motivating factors at any stage of life.

He distinguished between:

- Motivators; which give positive satisfaction, and
- Hygiene factors; that do not motivate if present, but, if absent, result in demotivation.

The name Hygiene factors is used because, like hygiene, the presence will not make you healthier, but absence can cause health deterioration. The theory is sometimes called the "Motivator-Hygiene Theory" and/or "The Dual Structure Theory." Herzberg's theory has found application in such occupational fields as information systems and in studies of user satisfaction.

Alderfer's ERG Theory

Clayton Alderfer, expanding on Maslow's hierarchy of needs, created the ERG theory. Physiological and safety, The lower order

needs, are placed in the existence category, while love and self esteem needs are placed in the relatedness category. The growth category contains our self-actualization and self-esteem needs.

Self-determination Theory

Self-determination theory, developed by Edward Deci and Richard Ryan, focuses on the importance of intrinsic motivation in driving human behaviour. Like Maslow's hierarchical theory and others that built on it, SDT posits a natural tendency towards growth and development. Unlike these other theories, however, SDT does not include any sort of "autopilot" for achievement, but instead requires active encouragement from the environment. The primary factors that encourage motivation and development are autonomy, competence feedback, and relatedness.

Broad Theories

The latest approach in Achievement Motivation is an integrative perspective as lined out in the "Onion-Ring-Model of Achievement Motivation" by Heinz Schuler, George C. Thornton III, Andreas Frintrup and Rose Mueller-Hanson. It is based on the premise that performance motivation results from the way broad components of personality are directed towards performance.

As a result, it includes a range of dimensions that are relevant to success at work but which are not conventionally regarded as being part of performance motivation. Especially it integrates formerly separated approaches as Need for Achievement with *e.g.* social motives like Dominance. The Achievement Motivation Inventory (AMI) is based on this theory and assesses three factors relevant to vocational and professional success.

Cognitive Theories

Goal-setting Theory

Goal-setting theory is based on the notion that individuals sometimes have a drive to reach a clearly defined end state.

Often, this end state is a reward in itself. A goal's efficiency is affected by three features: proximity, difficulty and specificity. An ideal goal should present a situation where the time between the initiation of behaviour and the end state is close. This explains why some children are more motivated to learn how to ride a bike than mastering algebra.

A goal should be moderate, not too hard or too easy to complete. In both cases, most people are not optimally motivated, as many want a challenge (which assumes some kind of insecurity of success). At the same time people want to feel that there is a substantial probability that they will succeed. Specificity concerns the description of the goal in their class. The goal should be objectively defined and intelligible for the individual. A classic example of a poorly specified goal is to get the highest possible grade. Most children have no idea how much effort they need to reach that goal.

Models of Behaviour Change

Social-cognitive models of behaviour change include the constructs of motivation and volition. Motivation is seen as a process that leads to the forming of behavioural intentions. Volition is seen as a process that leads from intention to actual behaviour. In other words, motivation and volition refer to goal setting and goal pursuit, respectively. Both processes require self-regulatory efforts.

Several self-regulatory constructs are needed to operate in orchestration to attain goals. An example of such a motivational and volitional construct is perceived self-efficacy. Self-efficacy is supposed to facilitate the forming of behavioural intentions, the development of action plans, and the initiation of action. It can support the translation of intentions into action.

Unconscious Motivation

Some psychologists believe that a significant portion of human behaviour is energized and directed by unconscious motives. According to Maslow, "Psychoanalysis has often

demonstrated that the relationship between a conscious desire and the ultimate unconscious aim that underlies it need not be at all direct. " In other words, stated motives do not always match those inferred by skilled observers.

For example, it is possible that a person can be accident-prone because he has an unconscious desire to hurt himself and not because he is careless or ignorant of the safety rules. Similarly, some overweight people are not hungry at all for food but for fighting and kissing. Eating is merely a defensive reaction to lack of attention. Some workers damage more equipment than others do because they harbour unconscious feelings of aggression towards authority figures.

Psychotherapists point out that some behaviour is so automatic that the reasons for it are not available in the individual's conscious mind. Compulsive cigarette smoking is an example. Sometimes maintaining self-esteem is so important and the motive for an activity is so threatening that it is simply not recognized and, in fact, may be disguised or repressed.

Rationalization, or "explaining away", is one such disguise, or defence mechanism, as it is called. Another is projecting or attributing one's own faults to others. "I feel I am to blame", becomes "It is her fault; she is selfish". Repression of powerful but socially unacceptable motives may result in outward behaviour that is the opposite of the repressed tendencies.

An example of this would be the employee who hates his boss but overworks himself on the job to show that he holds him in high regard. Unconscious motives add to the hazards of interpreting human behaviour and, to the extent that they are present, complicate the life of the administrator. On the other hand, knowledge that unconscious motives exist can lead to a more careful assessment of behavioural problems.

Although few contemporary psychologists deny the existence of unconscious factors, many do believe that these are activated only in times of anxiety and stress, and that in the ordinary course of events, human behaviour — from the subject's point of view — is rationally purposeful.

Intrinsic Motivation and the 16 Basic Desires Theory

Starting from studies involving more than 6,000 people, Professor Steven Reiss has proposed a theory that find 16 basic desires that guide nearly all human behaviour.

The desires are:

- Acceptance, the need for approval
- Curiosity, the need to think
- Eating, the need for food
- Family, the need to raise children
- Honour, the need to be loyal to the traditional values of one's clan/ethnic group
- Idealism, the need for social justice
- Independence, the need for individuality
- Order, the need for organized, stable, predictable environments
- Physical Activity, the need for exercise
- Power, the need for influence of will
- Romance, the need for sex
- Saving, the need to collect
- Social Contact, the need for friends (peer relationships)
- Status, the need for social standing/importance
- Tranquility, the need to be safe
- Vengeance, the need to strike back

In this model, people differ in these basic desires. These basic desires represent intrinsic desires that directly motivate a person's behaviour, and not aimed at indirectly satisfying other desires. People may also be motivated by non-basic desires, but in this case this does not relate to deep motivation, or only as a means to achieve other basic desires.

CONTROLLING MOTIVATION

The control of motivation is only understood to a limited extent. There are many different approaches of motivation

training, but many of these are considered pseudoscientific by critics. To understand how to control motivation it is first necessary to understand why many people lack motivation.

TYPES OF MOTIVATION

- *Achievement Motivation:* It is the drive to pursue and attain goals. An individual with achievement motivation wishes to achieve objectives and advance up on the ladder of success. Here, accomplishment is important for its own sake and not for the rewards that accompany it. It is similar to 'Kaizen' approach of Japanese Management.
- *Affiliation Motivation:* It is a drive to relate to people on a social basis. Persons with affiliation motivation perform work better when they are complimented for their favourable attitudes and co-operation.
- *Competence Motivation:* It is the drive to be good at something, allowing the individual to perform high quality work. Competence motivated people seek job mastery, take pride in developing and using their problem-solving skills and strive to be creative when confronted with obstacles. They learn from their experience.
- *Power Motivation:* It is the drive to influence people and change situations. Power motivated people wish to create an impact on their organization and are willing to take risks to do so.
- *Attitude Motivation:* Attitude motivation is how people think and feel. It is their self confidence, their belief in themselves, their attitude to life. It is how they feel about the future and how they react to the past.
- *Incentive Motivation:* It is where a person or a team reaps a reward from an activity. It is "You do this and you get that", attitude. It is the types of awards and prizes that drive people to work a little harder.

- *Fear Motivation*: Fear motivation coerces a person to act against will. It is instantaneous and gets the job done quickly. It is helpful in the short run.

REQUISITES TO MOTIVATE

- We have to be Motivated to Motivate
- Motivation requires a goal
- Motivation once established, does not last if not repeated
- Motivation requires Recognition
- Participation has motivating effect
- Seeing ourselves progressing Motivates us
- Challenge only motivates if you can win
- Everybody has a motivational fuse *i.e.* everybody can be motivated
- Group belonging motivates

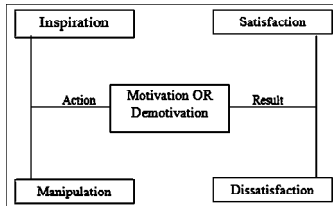
Motivating Different People In Different Ways

Motivation is not only in a single direction *i.e.* downwards. In the present scenario, where the workforce is more informed, more aware, more educated and more goal oriented, the role of motivation has left the boundaries of the hierarchy of management. Apart from superior motivating a subordinate, encouragement and support to colleague as well as helpful suggestions on the right time, even to the superior, brings about a rapport at various work levels. Besides, where workforce is self motivated, just the acknowledgement of the same makes people feel important and wanted.

Difference between Motivation, Satisfaction, Inspiration and Manipulation

Motivation refers to the drive and efforts to satisfy a want or goal, whereas satisfaction refers to the contentment experienced when a want is satisfied. In contrast, inspiration

is bringing about a change in the thinking pattern. On the other hand Manipulation is getting the things done from others in a predetermined manner.



Hence, manipulation or external stimulus as well as inspiration or internal stimulus acts as carriers of either demotivation or motivation which in turn either results into dissatisfaction or satisfaction depending upon.

VISUALIZATION TECHNIQUES

IMPROVE YOUR SPORT PERFORMANCE WITH VISUALIZATION TECHNIQUES

Many athletes routinely use visualization techniques as part of training. There are stories and examples of how such techniques provide not only a competitive edge, but a renewed mental awareness and sense of well-being. Visualization has also been called guided imagery, mental rehearsal, mediation, and a variety of other things—no matter the term, the basic techniques and concepts are the same. Generally speaking, visualization is the process of creating a mental image or intention of what you want to happen or feel.

An athlete can use this technique to 'intend' an outcome of a race or training session, or simply to rest in a relaxed feeling of calm and well-being. By imagining a scene, complete with images of a previous best performance or a future desired outcome, the athlete is instructed to simply 'step into' that feeling.

While imagining these scenarios, the athlete should try to imagine the detail and the way it feels to perform in the desired way. These scenarios can include any of the senses. They can be visual, kinesthetic, or auditory. Using the mind, an athlete can

call up these images over and over, enhancing the skill through repetition or rehearsal, similar to physical practice. With mental rehearsal, minds and bodies become trained to actually perform the skill imagined. Research is finding that both physical and psychological reactions in certain situations can be improved with visualization. Such repeated imagery can build both experience and confidence in an athlete's ability to perform certain skills under pressure, or in a variety of possible situations.

The most effective visualization techniques result in a very vivid sport experience in which the athlete has complete control over a successful performance and a belief in this new 'self.' Guided imagery, visualization, mental rehearsal or other such techniques can maximize the efficiency and effectiveness of your training. In a world where sports performance and success is measured in seconds, most athletes will use every possible training technique at hand. Visualization might be one way to gain that very slim margin.

STRESS, ANXIETY AND ENERGY

Too much stress and anxiety can seriously affect your ability to focus on your skills and flow in a performance. This section examines the causes of excess stress and anxiety, explains their symptoms and then explains techniques that you can use to manage them. It is important that you recognise that you are responsible for your own stress levels.

Very often they are a product of the way that you think. Learn to monitor your stress levels, and adjust them up if you need more arousal, or down if you are feeling too stressed. Also learn that other people may seek to manipulate your stress levels: if you are feeling stressed and uptight, the last thing you may need is a motivational talk from a coach or manager who may not be able to see your stress.

STRESS

A certain level of stress is needed for optimum performance. If you are under too little stress, then you will

find it difficult to motivate yourself to give a good performance. Too little stress expresses itself in feelings of boredom and not being stretched. At an optimum level of stress you will get the benefits of alertness and activation that a good level of stress brings. Excessive levels of stress damage performance and damage your enjoyment of your sport.

These excessive levels occur in the following circumstances:

- When you think that what is being asked of you is beyond your perceived abilities
- When too much is asked of you in too short a space of time
- When unnecessary obstacles are put in the way of achieving goals

The negative effects of stress are:

- That it gets in the way of judgement and fine motor control
- It causes competition to be seen as a threat, not a challenge
- It damages the positive frame of mind you need for high quality competition by:
 - Promoting negative thinking
 - Damaging self-confidence
 - Narrowing attention
 - And disrupting flow
- It consumes mental energy in, for example, worry. This is energy that you could devote to keeping technique good

Very often stress can be caused by negative thinking as well as being a result of negative thinking: If you interpret a situation saying 'I'm in trouble', then you are much less likely to do well than if you think positively, seeing a new situation as an opportunity to exhibit your skills at a higher level.

Stress and Adrenaline

When you are in a competitive environment or are in an

environment in which you are being evaluated, adrenaline may enter your bloodstream.

This has the following positive and negative effects on your body:

- Positive Effects:
 - Adrenaline causes physiological arousal
 - It causes alertness
 - It prepares the body for explosive activity
- Negative Effects:
 - It inhibits judgement
 - It interferes with fine motor control, and makes executing complex skills difficult

You will experience the preparatory flow of adrenaline into your body typically as 'Butterflies in your stomach'. In sports such as shooting where fine motor control is important, adrenaline may be a negative factor. However in sports like sprinting or power lifting, where explosive activity is required, adrenaline may be useful in generating optimum performance. You may currently view high levels of adrenaline in your body negatively as stress. You may need to review this, perhaps welcoming adrenaline as an aid to your performance. Similarly you might like to consider using 'Psych Up' routines to raise your adrenaline levels if you are not sufficiently aroused.

ANXIETY

Anxiety is different from stress. Anxiety comes from a concern over lack of control over circumstances. In some cases being anxious and worrying over a problem may generate a solution. Normally, however, it will just result in negative thinking.

Albert Ellis listed the five main unrealistic desires or beliefs that cause anxiety:

- The desire always to have the love and admiration of all people important to you. This is unrealistic because you have no control over other peoples minds: people can have bad days, can see things in odd ways, can make mistakes, or can be plain disagreeable and awkward.

- The desire to always be thoroughly competent. This is unrealistic because you only achieve competence at a new level by making mistakes. Everybody has bad days and makes mistakes. One of the benefits of training with better athletes is that you can see them making mistakes and having bad days too.
- The belief that external factors cause all misfortune. Often negative events can be caused by your own negative attitudes. Similarly your own negative attitudes can cause you to view neutral events negatively. Another athlete might find something positive in something you view as a problem.
- The desire that events should always turn out the way that you want them to and people should always do what you want. Other people have their own agendas and do what they want to do.
- The belief that everything that has happened in the past will inevitably condition and control what has happened in the future. Very often things can be improved or changed if you try hard enough, or look at things in a different way.

MENTAL ENERGY

Mental energy to be able to concentrate your attention and maintain good mental attitudes. If you are concentrating effectively then you can conserve physical energy by maintaining good technique when your muscles are tired, can maintain focus and good execution of skills, and can push and drive your body through pain and fatigue barriers. You can waste mental energy on worry, stress, fretting over distractions, and negative thinking.

Over a long competition these not only damage enjoyment, but also drain energy so that performance suffers. It is therefore important to avoid these by good use of sports psychology, and by resting effectively between events and by ensuring that you sleep properly.

LEADERSHIP

Leadership is the act of influencing individuals and groups towards a set goal. Leader can be both appointed by a group or emerge from the group naturally. In sport, the typical leader is the coach. Effective coaches demonstrate effective behaviours such as focusing on the positive and providing clear feedback and technical training.

Leaders can be task oriented and relationship oriented - relationship oriented leaders focus on developing and maintaining good relationships, and a task oriented leader focuses on setting goals and getting the job done. It is important that the leader match the correct style that they are using with the correct situations in order for them to be successful. The consequences of good leadership are satisfaction, cohesion and performance.

Some specific qualities of good leaders include:

- Integrity
- Flexibility
- Loyalty
- Confidence
- Accountability
- Candour
- Preparedness
- Resourcefulness
- Self discipline
- Patience

HEAD COACHES AS LEADERS

As a head coach, you've got position power over all the players. After all, you're determining the starting lineup. But as a coach, you need to understand that your role needs to be more than just a good judge of a player's abilities. If you want maximize the team's chances of winning, then you need to apply the same leadership theories that exist in today's workplace.

That means treating players with the respect they deserve. That also means understanding that the same leadership techniques do not apply to all players. As is the case with workers of varying strengths and weaknesses, sports coaches also need to flex their leadership style and practice the teachings of situational leadership.

EXAMPLES OF LEADERSHIP AT WORK IN SPORTS

There are many examples of team owners or general managers demonstrating an understanding the dynamics of leadership in professional sports. Since we're based out of the New York metropolitan area we'll use an example coming from the New York Giants. Jim Fassel was the head coach of the NY Giants from 1997 - 2003. In his first year with the Giants he was 10-5. In 2000, he led the team to a 12-4 record and trip to the Super Bowl.

Just three years later, the Giants finished up 4-12 and it was time for a change. According to all accounts, the players liked Coach Fassel. In fact, he is well known for his "playoff guarantee" during the 2000 season in which he led the Giants to what was thought to be an improbable Super Bowl run. But with a 4 - 14 record in 2003, the Giants decided to replace Jim Fassel with Tom Coughlin to start the 2004 season. It was certainly no accident that Tom's leadership style was much different than Jim's.

Fassel had become a friend of the players and Tom Coughlin was a no-nonsense guy with a firm hand. In 2003, Fassel was demonstrating the coaching leadership style - he was still the leader of the team but he sought advice from players in a participative manner. The team's management realized it was time for change so they brought in Tom Coughlin.

Tom's leadership style was to give much more direction; he was even autocratic at times. He was brought in to instill a sense of discipline back into the team. It is no accident Tom was selected, he demonstrates the leadership style that is most effective when a turn around is needed - whether that be in a company or a sports franchise.

GETTING THE MOST OUT OF PLAYERS

The great head coach of the Green Bay Packers, Vince Lombardi once said "Leaders are made, they are not born. They are made by hard effort, which is the price which all of us must pay to achieve any goal that is worthwhile." It's not easy to be an effective leader, you need to work hard to gain the confidence of the team and understand the motivational dynamics of each player.

Fortunately there are some simple rules that apply to all leadership situations, including sports:

- Treat players with respect and you will earn their respect.
- Try to understand each player on the team well enough to be able to identify their specific strengths and weaknesses.
- Lead by example - if you expect players to be on time, then you should never be late for a meeting yourself.
- Share your strategy with your players. It is much easier for players to support a strategy if they understand it.
- Remain decisive and confident. A coach's confidence can be contagious. If the players know that you believe in them, then they might start believing in themselves too.
- Finally, instruct players in a positive manner - tell them what you want them to do, not what you don't want them to do.

COGNITIVE STRATEGIES & ATHLETIC SUCCESS

There are certain mental and cognitive strategies that athletes can use to help themselves with competition and athletic success.

Successful athletes show a number of cognitive strategies, such as:

- Regulating and managing arousal levels,
- Showing self-confidence,

- Using concentration and focus,
- Feeling in control and not forcing things,
- Using positive imagery and thought,
- Exercising commitment and determination,
- Setting goals,
- Having well-developed plans and well-developed coping strategies.

Sport psychologists suggest some Guidelines For Practice:

- To enhance confidence, practice specific plans to deal with problems during competition.
- Practice routines to deal with unusual circumstances and distractions before and during competition.
- Concentrate wholly on the upcoming performance and block out irrelevant events and thoughts.
- Use several mental rehearsals prior to competition.
- Don't worry about other competitors before a competition - instead focus on what you can control - your own performance.
- Develop detailed competition plans.
- Learn to regulate arousal and anxiety.

FEEDBACK & REINFORCEMENT

Reinforcement is the use of rewards and punishments that will work to either encourage a certain action or decrease it in the future. This is called classical conditioning. There are two ways of using reinforcement - a positive approach and a negative approach.

The positive approach focuses on rewarding appropriate behaviour - this increases the likelihood of this behaviour happening again. The negative approach focuses on punishing undesirable behaviours and should lead to a decrease of these behaviours in the future. Most coaches and instructors combine positive and negative approaches, and sport psychologists agree

that the predominant approach with physical activity should be a positive one, as negative approaches instill fear in the participants.

W TO POSITIVELY REINFORCE SOMEONE

- Choose positive reinforcers - *i.e.* activities or items.
- Time and schedule the reinforcers - if someone is learning something new - continuous and immediate reward is a good strategy. If you are attempting to reinforce an already learned skill - then intermittent and immediate reinforcement is a good strategy.
- You should also shape or reinforce behaviours that are close to the one you are trying to teach - if it is difficult.
- Reward good performance, as well as good outcome.
- Reward effort.
- Reward emotional and social skills.
- Provide knowledge of the results.
- Provide motivational and instructional feedback.

PUNISHMENT (NEGATIVE REINFORCEMENT)

Punishment can control and change behaviour - but 80 per cent - 90 per cent of reinforcement should be positive.

There are several drawbacks to punishment:

- Can arouse fear of failure.
- Can act as a reinforcer.
- Can hinder learning skills

There are also several guidelines for using punishment:

- Be consistent by giving everyone the same type of punishment for breaking similar rules.
- Punish the behaviour - not the person - tell the person it is the behaviour that needs to change, not the person.
- Allow an athletes input in making up the punishment for breaking the rules.

- Do not use physical activity as a punishment.
- Make sure the punishment is not perceived as a reward or simply as attention
- Impose punishment impersonally - do not berate or yell - simply inform them of their punishment.
- Do not punish athletes for making errors while they are playing.
- Do not embarrass individuals in front of others.
- Use punishment sparingly, but enforce it when you use it.

MODIFYING BEHAVIOUR IN SPORT

Behaviour modification is the use of the basic principles of reinforcement in order to change behaviour. These techniques have been successfully used to modify sport and physical behaviours and have been developed into Behaviour programmes. Behaviour programmes target behaviours, record them, provide meaningful feedback and have tailored reward systems.

AGGRESSION IN SPORT

The relationship between sport and aggression has been studied extensively for decades, yet investigators still have only an incomplete understanding of the link between the two. That there is a link seems certain, and researchers in various disciplines continue trying to refine their understanding of it in ways that will illuminate both sport and society. In the first half of the 20th century, many psychologists assumed that participation in sports might allow individuals to vent their aggressive tendencies.

Generally, these assumptions arose from the view that aggression is an internal drive based on frustration and/or instinct. However, more recent research shows the opposite - participation in sports is likely to increase an individual's aggression.

Sport psychologists distinguish between hostile and instrumental aggression. The primary purpose of hostile aggression is to inflict physical or psychological injury on another; the main aim of instrumental aggression is to attain an approved goal, such as winning a game.

These two forms of aggression can be distinguished clearly in most sport situations, although not necessarily in extreme contact sports such as boxing and ice hockey. Recent research suggests that instrumental aggression in sport may spill over into hostile aggression outside of sport, for example, male athletes involved in sexual assault against women.

BACKDROP

Some argued that sport developed as a constraint on aggression, or at least as a means to channel aggression into culturally acceptable forms. Others have contended that sports do not necessarily increase aggression, but rather reflect and enhance the dominant values and attitudes of the broader culture. Yet another school of thought has proposed that sport creates a separate moral sphere, distinct from the real world, in which the goal of winning is more important than the rules of the game.

Others consider that when athletes are overly aggressive; they are overconforming to what they see as acceptable within the sport. Display of machismo, playing with pain, or intentionally injuring an opponent may be "grounded in athletes' uncritical acceptance of and commitment to what they have been told by important people in their lives ever since they began participating in competitive programmes. Where winning is valued above all else, athletes may use aggression to show their total commitment to sport or to winning in sport.

AGGRESSION AND THE INDIVIDUAL

Individuals who participate in sports seem to exhibit higher levels of aggression than those who do not. However, this may be because sports attract people who are naturally

more aggressive than nonathletes. Some sports are more likely to be associated with violence and inappropriate aggression. When provoked, for example, participants in contact sports reveal much higher levels of aggression than those in noncontact sports. Research also shows that aggression may give players an edge when used early in a contest, or they may show aggression if they fail in the sport.

Other factors also influence aggression during sports events. For example, the presence of officials in organized sports increases the number of fouls since the athletes assume it is the referees' job to control inappropriate aggression. Studies of martial arts suggest that sport participation does not necessarily promote aggression.

For example, one study showed that among 13-to-17-yearold delinquents, the group that was taught the philosophical elements of Tae Kwon Do-respect for others, maintaining a sense of responsibility, for example-along with the physical component lowered their aggression levels, compared to those who were not taught the philosophy or engaged in activities other than Tae Kwon Do.

Aggression and the Group Some scholars have argued that games are models of culturally relevant activities and provide the greatest opportunity to practice and to learn these activities. American football is an unmistakable model of warfare, for example, with its "men in the trenches", "field generals", efforts by teams to move the ball into "enemy territory" and, ultimately, scoring by "invading" the opponent's end zone. Cross-cultural studies too show a positive association between the existence of combative sports and the prevalence of warfare in particular cultures. Not all sports fit this model, though.

Baseball, in contrast, cannot be so directly linked with any single culturally relevant activity, although running, clubbing, and missile throwing were all important activities in human evolutionary history. Aggression is appropriate, even essential for success in war, but what happens to individuals with heightened levels of aggression in peacetime or when there is no active war in which to channel their aggression?

Recently, this question-still controversial-has been raised about violence towards women. Several studies indicate that athletes are disproportionately represented among rapists and others who abuse women physically. Other investigators suggest that sports contribute to male dominance by linking maleness with acceptable aggression while belittling women and their activities.

Some researchers believe that athletes are unfairly stereotyped because they are more visible and are typically held to higher standards. Aggression and Fan Violence by sport spectators or fans has become an issue of considerable concern. Soccer hooliganism in Great Britain has received much attention as have violent confrontations between European soccer fans. What is it about sports that excites spectators to violent aggression? One theory is that it directly results from observing athletes' aggression; another links it to fans'desire to establish their own social identity; a third proposes that spectator violence is a kind of ritual.

Drugs, especially alcohol, are another common element in spectator aggression. During the 1995 U.S. National Football League season, a national audience was treated to a game-long spectacle of fans throwing snowballs and ice at players, coaches, and officials on the field, as well as at each other, during a game between the New York Giants and the San Diego Chargers. Alcoholic beverages were subsequently banned from Giants Stadium for the next home game to be played there. Drugs have also been implicated in aggressiveness by players.

In particular, steroids, usually taken surreptitiously by athletes, appear to heighten aggressiveness. Aggression, Sport, and Mass Media Instant replays have brought an interesting but chilling phenomenon in modern sport spectatorship. Scoring plays or other exciting or exceptional plays are commonly replayed. But also commonly replayed are tactics that involve exceptional aggressiveness, such as a "good hit" or a particularly devastating down-field block in American football. This replaying occurs even when the violent moves have little apparent effect on the outcome of the game or the

particular play. Aggressive acts that lead to actual violence-fights among players-are frequently replayed or rebroadcast on sports shows. Spectators seem to enjoy exhibitions of aggression and even violence, while players in many sports believe that aggressive play is instrumental in winning. Precisely how sports and aggression are linked is unclear, but that they are linked seems certain.

Sports may be one way to teach young people how and when to use violent forms of aggressive behaviour. Young athletes observe the behaviour of role models and learn from interactions with coaches, parents, and others. This may well have long-lasting consequences for individuals and for society.

Can there be sport without increased aggression? Studies suggest that sport could be reformed so that it would not necessarily lead to increases in aggression. Spectators and players both would experience sport in a different way. Nevertheless, it seems likely that sport could be enjoyed without the promotion of inappropriate aggression.

4

Sports Medicine and Rehabilitation

MEANING AND IMPORTANCE OF SPORTS MEDICINE

MEANING

Sports medicine is an area of health and special services that apply medical and scientific knowledge to prevent, recognize, manage, and rehabilitate injuries related to sport, exercise, or recreational activity.

THE IMPORTANCE OF SPORTS MEDICINE

Injuries occur as good as in sports, they occur some-more frequently! When they do happen, we wish to be equates to redeem fast as good as get behind in the diversion as good as sports disinfectant will assistance you.

Sports disinfectant is the margin of disinfectant which concentrates only upon the injuries subsequent from sports such as football, baseball, basketball, as good as alternative sports. There have been most opposite kinds of sports injuries as good as this operation equates to which there have to be multiform kinds of doctors as good as specialists. Sports disinfectant additionally involves the work of researchers seeking in to the assorted ways to assistance all kinds of injuries,

corporations who validate the athletes as good as additionally assistance out with the costs of sports disinfectant as good as of march the family as good as the contestant himself who has to assist in the process. Sports disinfectant is the extended margin as the result, yet this equates to which we can find assistance for your own injuries no have the difference what kind we have.

Sports disinfectant is really critical when we have been any arrange of athlete, even in dilettante spheres. This is since sports injuries equate to the good understanding of repairs to your physique which will quickly spin to prolonged tenure repairs if it isn't dealt with properly. For example, fractures can lead to problems similar to permanent corner pain, arthritis, as good as ubiquitous aches as well as pains.

Bones which aren't set scrupulously or rehabilitated scrupulously will have distant reduction mobility as good as will hurt your capability to fool around sports. And some-more critical injuries which take the prolonged time to reanimate equates to which we need assistance to get your muscles as good as skeleton behind in operative sequence which additionally requires the skills of someone who is in the margin of sports medicine.

Sports disinfectant is additionally about the impediment of destiny injuries. For example, your alloy will go over ways to equivocate injuries in the future, risk factors to avoid, as good as things to do which will have firm your physique as good as have we reduction disposed to destiny injuries. You might have to tweak your diet, practice otherwise or simply practice some-more counsel in the field! Your alloy will additionally discuss it we any diet changes we need to have to recompense for the recovering process.

Sports disinfectant is additionally about us though. You need to put yourself as good as your needs prior to the needs of the group as good as take the time to caring for yourself. This benefits we since we can combine only upon your repairs as good as removing good which equates to you'll get improved faster as good as be equates to get behind to what we adore doing.

Your family should additionally await us in your efforts to get improved by creation sure we go to your sessions as good as stay upon aim with goals. At the finish of the process, we will feel empowered as good as healed as good as this thoughts set is critical for removing behind in the game.

Sports disinfectant is really critical to any contestant of any ability level. Getting harmed is never fun as good as sports injuries have been the little of the misfortune injuries for your physique since they equates to the lot of prolonged tenure repairs which will hurt your sports chances after upon in life, not to discuss reduce your peculiarity of life.

Make sure which if we get injured, we get assistance from someone who is specialized in sports injuries so which we get the assistance we need as good as to illustrate can entirely redeem with no side goods or repairs after upon in life.

DOPING: MEANING AND DRUGS FOR DOPING

WHAT IS DOPING

'Doping' is the word used in sport when athletes use prohibited substances or methods to unfairly improve their sporting performance.

WHY IS DOPING IN SPORT PROHIBITED

The use of doping substances or doping methods to enhance performance is fundamentally wrong and is detrimental to the overall impact of sport.

Drug misuse can be harmful to an athlete's health or to other athletes competing in the sport. It severely damages the integrity, image and value of sport, whether or not the motivation to use drugs is to improve performance.

To achieve integrity and fairness in sport, a commitment from athletes is critical, but the fans watching their favourite athletes competing also need to demand that athletes succeed.

WHAT IS THE WORLD ANTI-DOPING AGENCY

The World Anti-Doping Agency (WADA) is the international independent organization created in 1999 to promote, coordinate, and monitor the fight against doping in sport in all its forms. Composed and funded equally by the sports movement and governments of the world, WADA coordinated the development and implementation of the World Anti-Doping Code (Code), the document harmonizing anti-doping policies in all sports and all countries.

FAUST'S GOLD

It is not just athletes who are involved in the doping games, however. Coaches, managers, team doctors and fringe practitioners have all been implicated. Eric Rykaert, medical officer of the Festina cycling team, was prosecuted for possession of erythropoietin in 1999.

The Australian swimming team coach for the 2000 Sydney Olympics, Gennadi Touretski was found in possession of stanozolol; interestingly this discovery was made following the arrest of two heroin addicts who burgled his home. But perhaps the most sinister of all, is the publication last year of the book "Faust's Gold" which takes an in-depth look at the systematic doping machine implemented by the German Democratic Republic (GDR) in the 1970s.

The GDR regime involved the state, sports federation officials, coaches and sports physicians and activities were encouraged by the secret police. Many of the athletes were given performance enhancing agents without their knowledge; 142 former female athletes experienced androgenic changes, infertility and delivery of abnormal offspring as a result of involuntary drug abuse and are currently seeking compensation in the courts; an initial payment of 2 million euro has been paid by the German parliament.

Heidi Krieger, the GDR shot-putter had so many testosterone injections that she opted for a gender change and now lives as Andreas Krieger. It is estimated that as many as 10,000 athletes were processed through the GDR doping

machine. The former state sports physician Manfred Hoepfner, and the Head of the GDR Sports Federation, Manfred Ewald (1961 - 1988), received a 22 month sentence in 1999 for unlawful use of drugs.

However, it is not only the East Germans who were involved in such dubious practices. The US cycling team bought into the practice of blood doping and during the 1984 Los Angeles (LA) games, a professor of medicine, no less, supervised the transfusion of non-cross-matched blood from families of cyclists in an LA hotel room; hardly an aseptic environment. In the same games, 86 athletes tested positive for anabolic steroids; interestingly 9 of these positive test results disappeared from the laboratory.

ACUTE INJURIES: DEHYDRATION, HEAT STROKE, EXERCISE-INDUCED ASTHMA

ACUTE INJURY

An acute injury is an injury with a sudden onset, usually as a result of trauma. When treated promptly, such injuries are of limited duration. Untreated injuries can develop complications that may lead to chronic injuries, injuries that persist in the long term without resolving, and in some cases, people can die from untreated acute injuries. Treatment of severe acute injuries is the province of the emergency room, while milder injuries can be managed at home with first aid.

Some causes of acute injuries are burns, electrical shock, car accidents, falls, sprains and strains, and fights. In all cases, a single incident causes an injury and the severity of the injury can vary. People with mild acute injuries retain consciousness and do not require extensive medical intervention.

More severe injuries may require surgery and other emergency measures to prevent loss of life or permanent disability for the injured person. Certain acute injuries are larger causes for concern than others. Head injuries must be carefully

evaluated because they can result in brain damage and may put a patient at risk for complications in the future. Bruising of the abdomen as seen in car accidents, some types of falls, and beatings can also be a worry because it is possible for the patient to experience internal bleeding or organ damage that are not readily apparent. Likewise, an acute injury acquired in a contaminated environment is worrisome to care providers because it can lead to infections if microorganisms and other materials managed to enter the patient's body.

Immediate treatment of an acute injury requires assessment to determine the location and nature of the injury. The patient's level of consciousness must also be assessed. If the patient is breathing, talking, and experiencing minimal pain after an acute injury, these can be signs that the injury is minor and can be treated with cleaning and monitoring. Patients who experience severe pain, have difficulty breathing, or develop an altered level of consciousness may require attention from a physician.

The concern with acute injuries is that if they are not treated appropriately, the patient can develop secondary injuries. These can include infection, inflammation, tissue death, disfigurement, permanent muscle damage, and other problems.

Providing patients with timely and appropriate treatment for an acute injury can limit damage that leads to chronic problems. For example, if an athlete has a torn ligament, the limb involved needs to be rested and the patient may need physical therapy to rebuild strength.

DEHYDRATION

Water is a critical element of the body, and adequate hydration is a must to allow the body to function. Up to 75 per cent of the body's weight is made up of water. Most of the water is found within the cells of the body (intracellular space).

The rest is found in what is referred to as the extracellular space, which consists of the blood vessels (intravascular

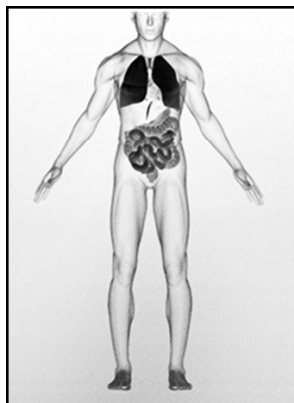
space) and the spaces between cells (interstitial space). Total body water = intracellular space + intravascular space + interstitial space Dehydration occurs when the amount of water leaving the body is greater than the amount being taken in. The body is very dynamic and always changing. This is especially true with water in the body.

We lose water routinely when we:

- Breathe and humidified air leaves the body;
- Sweat to cool the body; and
- Urinate or have a bowel movement to rid the body of waste products.

In a normal day, a person has to drink a significant amount of water to replace this routine loss. If intravascular (within the blood vessels) water is lost, the body can compensate somewhat by shifting water from within the cells into the blood vessels, but this is a very short-term solution. The body lives within a very narrow range of normal parameters, and signs and symptoms of dehydration will occur quickly if the water is not replenished.

The body is able to monitor the amount of fluid it needs to function. The thirst mechanism signals the body to drink water when the body is dry. As well, hormones like anti-diuretic hormone (ADH) work with the kidney to limit the amount of water lost in the urine when the body needs to conserve water.





What Causes Dehydration

Dehydration occurs because there is too much water lost, not enough water taken in, or most often a combination of the two.

- *Diarrhea:* Diarrhea is the most common reason for a person to lose excess amounts of water. A significant amount of water can be lost with each bowel movement. Worldwide, more than four million children die each year because of dehydration from diarrhea.
- *Vomiting:* Vomiting can also be a cause of fluid loss and it is difficult for a person to replace water by drinking it if they are unable to tolerate liquids.
- *Sweat:* The body can lose significant amounts of water when it tries to cool itself by sweating. Whether the body is hot because of the environment (for example, working in a warm environment), intense exercising in a hot environment, or because a fever is present due to an infection; the body uses a significant amount of water in the form of sweat to cool itself. Depending upon weather conditions, a brisk walk may generate up to 16 ounces of sweat (a pound of water) to allow body cooling, and that water needs to be replaced.

- *Diabetes*: In people with diabetes, elevated blood sugar levels cause sugar to spill into the urine and water then follows, which may cause significant dehydration. For this reason, frequent urination and excessive thirst are among the early symptoms of diabetes.
- *Burns*: Burn victims become dehydrated because the damaged skin cannot prevent fluid from seeping out of the body. Other inflammatory diseases of the skin are also associated with fluid loss.
- *Inability to drink fluids*: The inability to drink adequately is the other potential cause of dehydration. Whether it is the lack of availability of water or the lack of strength to drink adequate amounts, this, coupled with routine or extraordinary water losses can compound the degree of dehydration.

SIGNS AND SYMPTOMS OF DEHYDRATION

The body's initial responses to dehydration are thirst to increase water intake along with decreased urine output to try to conserve water. The urine will become concentrated and more yellow in colour. As the level of water loss increases, more symptoms can become apparent.

The following are further signs and symptoms of dehydration:

- Dry mouth,
- The eyes stop making tears,
- Sweating may stop,
- Muscle cramps,
- Nausea and vomiting,
- Heart palpitations, and
- Lightheadedness (especially when standing).

The body tries to maintain cardiac output (the amount of blood that is pumped by the heart to the body); and if the amount of fluid in the intravascular space is decreased, the

body tries to compensate for this decrease by increasing the heart rate and making blood vessels constrict to try to maintain blood pressure and blood flow to the vital organs of the body. This coping mechanism begins to fail as the level of dehydration increases.

With severe dehydration, confusion and weakness will occur as the brain and other body organs receive less blood. Finally, coma and organ failure, and death eventually will occur if the dehydration remains untreated.

How is Dehydration Diagnosed

Dehydration is often a clinical diagnosis. Aside from diagnosing the reason for dehydration, the health care practitioner's examination of the patient will assess the level of dehydration.

Initial evaluations may include:

- Mental status tests to evaluate whether the patient is awake, alert, and oriented. Infants and children may appear listless and have whiny cries and decreased muscle tone.
- Vital signs may include postural readings (blood pressure and pulse rate are taken lying down and standing). With dehydration, the pulse rate may increase and the blood pressure may drop because the intravascular space is depleted of fluid. People taking beta blocker medications for high blood pressure, heart disease, or other indications, occasionally lose the ability to increase their heart rate as a compensation mechanism since these medications block the adrenaline receptors in the body.
- Temperature may be measured to assess fever.
- Skin may be checked to see if sweat is present and to assess the degree of elasticity (turgor). As dehydration progresses, the skin loses its water content and becomes less elastic.

- Infants may have additional evaluations performed, including checking for a soft spot on the skull (sunken fontanelle), assessing the suck mechanism, muscle tone, or loss of sweat in the armpits and groin. All are signs of potential significant dehydration.
- Pediatric patients are often weighed during routine child visits, thus a body weight measurement may be helpful in assessing how much water has been lost with the acute illness.

Laboratory Testing

The purpose of blood tests is to assess potential electrolyte abnormalities (especially sodium levels) associated with the dehydration. Tests may or may not be done on the patient depending upon the underlying cause of dehydration, the severity of illness, and the health care practitioner's assessment of their needs. Urinalysis may be done to determine urine concentration - the more concentrated the urine, the more dehydrated the patient.

How is Dehydration Treated

As is often the case in medicine, prevention is the important first step in the treatment of dehydration. Fluid replacement is the treatment for dehydration. This may be attempted by replacing fluid by mouth, but if this fails, intravenous fluid (IV) may be required. Should oral rehydration be attempted, frequent small amounts of clear fluids should be used.

Clear fluids include:

- Water,
- Clear broths
- Popsicles
- Jell-O
- Other replacement fluids that may contain electrolytes (Pedialyte, Gatorade, Powerade, etc.)

Decisions about the use of intravenous fluids depend upon the health care practitioner's assessment of the extent of dehydration and the ability for the patient to recover from the underlying cause.

The success of the rehydration therapy can be monitored by urine output. When the body is dry, the kidneys try to hold on to as much fluid as possible, urine output is decreased, and the urine itself is concentrated. As treatment occurs, the kidneys sense the increased amount of fluid, and urine output increases. Medications may be used to treat underlying illnesses and to control fever, vomiting, or diarrhea.

Can I Treat Dehydration at Home

Dehydration occurs over time. If it can be recognized in its earliest stages, and if its cause can be addressed, home treatment may be beneficial and adequate.

Steps a person can take at home to prevent severe dehydration include:

- Individuals with vomiting and diarrhea can try to alter their diet and use medications to control symptoms to minimize water loss. Clear fluids often recommended as the diet of choice for the first 24 hours, with gradual progression to a BRAT diet (bananas, rice, apples, toast) and then adding more foods as tolerated.
- Loperamide (Imodium) may be considered to control diarrhea.
- Acetaminophen or ibuprofen may be used to control fever.
- Fluid replacements may be attempted by small, frequent amounts of clear fluids. The amount of fluid required to maintain hydration depends upon the individual's weight. The average adult needs between 2 and 3 liters of fluid per day.

If the person becomes confused or lethargic; if there is persistent, uncontrolled fever, vomiting, or diarrhea; or if there

are any other specific concerns, then medical care should be accessed. Emergency medical system (EMS) or 911 should be activated for any individual with altered mental status - confusion, lethargy, or coma.

WHAT ARE THE COMPLICATIONS OF DEHYDRATION

Complications of dehydration may occur because of the dehydration, and/or because of the underlying disease or situation that causes the fluid loss.

Kidney Failure

Kidney failure is a common occurrence, although if it is due to dehydration and is treated early, it is often reversible. As dehydration progresses, the volume of fluid in the intravascular space decreases, and blood pressure may fall. This can decrease blood flow to vital organs like the kidneys, and like any organ with a decreased blood flow; it has the potential to fail to do its job.

Coma

Decreased blood supply to the brain may cause confusion and even coma. If enough organs begin to malfunction, the body itself may fail, and death can occur.

Shock

When the fluid loss overwhelms the body's ability to compensate, blood flow and oxygen delivery to the body's vital organs become inadequate and cell and organ function can begin to fail.

Heat-Related Illnesses and Associated Complications

In heat-related illness, the body's attempt to cool itself by sweating may cause dehydration to the point that muscles may go into spasm (heat cramps). It is often the muscles that are being stressed that will spasm (for example, in people who

work outside in a hot environment, arm and leg muscles may spasm from lifting and moving heavy objects or equipment; in athletes, leg muscles may fail from running). As fluid loss increases, the patient may be so dehydrated that there is not enough water to sweat and heat exhaustion or heat stroke may occur. Heat stroke is a true medical emergency and 911 or the Emergency Response System should be activated immediately in this situation.

Electrolyte Abnormalities

In dehydration, electrolyte abnormalities may occur since important chemicals (like sodium and potassium) are lost from the body through sweat. For example, patients with profuse diarrhea or vomiting may lose significant amounts of potassium, causing muscle weakness and heart rhythm disturbances. The health care practitioner is often aware of the fluid and electrolyte balance in the dehydrated patient and may decide to monitor electrolyte levels by checking blood tests.

Some examples of symptoms caused by abnormal electrolyte levels include muscle weakness due to low potassium, heart rhythm disturbances due to either low or high potassium, and seizures due to low (hyponatremia) or high sodium. In many patients with dehydration, the kidneys are able to compensate and regulate electrolyte levels.

It is reasonable to remember that dehydration does not occur quickly, and sometimes it may take hours to slowly correct the fluid deficit and allow the electrolytes to redistribute themselves appropriately in the different spaces in the body. If rehydration is done too slowly, the patient may remain hypotensive and in shock for too long. If done too quickly, water and electrolyte concentrations within organ cells can be negatively affected, causing cells to swell and eventually die.

Can Dehydration be Prevented

- *Environment:* Dehydration due to the weather is a preventable condition. If possible, activities should

not be scheduled in the heat of the day. If they are, adequate fluids should be available, and cooler, shaded areas should be used if possible. Of course, people should be monitored to make certain they are safe. Those working in hot environments need to take care to rehydrate often.

- *Exercise:* People exercising in a hot environment need to drink adequate amounts of water.
- *Age:* The young and elderly are most at risk. During heat waves, attempts should be made to check on the elderly in their homes. During the Chicago heat wave of 1995, more than 600 people died in their homes from heat exposure.
- *Heat related conditions:* Know the signs and symptoms of heat cramps, heat rash, heat exhaustion, and heat stroke. Preventing dehydration is one step to avoid these conditions.

Dehydration at a Glance

- The body needs water to function.
- Dehydration occurs when water intake is less than water loss.
- Symptoms range from mild to life-threatening.
- The young and the elderly are especially susceptible to dehydration.

HEAT STROKE

Heat stroke is a form of hyperthermia, an abnormally elevated body temperature with accompanying physical and neurological symptoms.

Unlike heat cramps and heat exhaustion, two other forms of hyperthermia that are less severe, heat stroke is a true medical emergency that can be fatal if not properly and promptly treated. Heat stroke is also sometimes referred to as heatstroke.

The body normally generates heat as a result of metabolism, and is usually able to dissipate the heat by either radiation of heat through the skin or by evaporation of sweat. However, in extreme heat, high humidity, or vigorous physical exertion under the sun, the body may not be able to dissipate the heat and the body temperature rises, sometimes up to 106 F (41.1 C) or higher. Another cause of heat stroke is dehydration. A dehydrated person may not be able to sweat fast enough to dissipate heat, which causes the body temperature to rise.

Those most susceptible individuals to heat strokes include:

- Infants,
- The elderly (often with associated heart diseases, lung diseases, kidney diseases, or who are taking medications that make them vulnerable to dehydration and heat strokes),
- Athletes, and
- Individuals who work outside and physically exert themselves under the sun.

Heat Stroke Symptoms and Signs

Symptoms of heat stroke can sometimes mimic those of heart attack or other conditions. Sometimes a person experiences symptoms of heat exhaustion before progressing to heat strokes.

Signs and symptoms of heat exhaustion include:

- Nausea,
- Vomiting,
- Fatigue,
- Weakness,
- Headache,
- Muscle cramps and aches, and
- Dizziness.

However, some individuals can develop symptoms of heat stroke suddenly and rapidly without warning. Different people may have different symptoms and signs of heatstroke.

But common symptoms and signs of heat stroke include:

- High body temperature,
- The absence of sweating, with hot red or flushed dry skin,
- Rapid pulse,
- Difficulty breathing,
- Strange behaviour,
- Hallucinations,
- Confusion,
- Agitation,
- Disorientation,
- Seizure, and/or
- Coma.

How do you Treat a Heat Stroke Victim

Victims of heat stroke must receive immediate treatment to avoid permanent organ damage.

First and foremost, cool the victim:

- Get the victim to a shady area, remove clothing, apply cool or tepid water to the skin (for example you may spray the victim with cool water from a garden hose), fan the victim to promote sweating and evaporation, and place ice packs under armpits and groin.
- Monitor body temperature with a thermometer and continue cooling efforts until the body temperature drops to 101 to 102 F (38.3 to 38.8 C).
- Always notify emergency services (911) immediately. If their arrival is delayed, they can give you further instructions for treatment of the victim.

How can Heat Stroke be Prevented

- The most important measures to prevent heat strokes

are to avoid becoming dehydrated and to avoid vigorous physical activities in hot and humid weather.

- If you have to perform physical activities in hot weather, drink plenty of fluids (such as water and sports drinks), but avoid alcohol, caffeine, and tea which may lead to dehydration.
- Your body will need replenishment of electrolytes (such as sodium) as well as fluids if you sweat excessively or perform vigorous activity in the sunlight for prolonged periods.
- Take frequent breaks to hydrate yourself. Wear hats and light-coloured, lightweight, loose clothes.

Heat Stroke at a Glance

- Heat stroke is a form of hyperthermia, in which the body temperature is elevated dramatically.
- Heat stroke is a medical emergency and can be fatal if not promptly and properly treated.
- Cooling the victim is a critical step in the treatment of heat stroke.
- The most important measures to prevent heat strokes are to avoid becoming dehydrated and to avoid vigorous physical activities in hot and humid weather.
- Infants, the elderly, athletes, and outdoor workers are the groups at greatest risk for heat stroke.

EXERCISE-INDUCED ASTHMA

Asthma is a chronic inflammation of the breathing passages (bronchi) of the lungs. Asthma is characterized by sudden attacks or periods of bothersome or severe symptoms separated by periods of mild symptoms, or no symptoms at all. The inflammatory reaction of asthma is triggered by external factors or specific situations.

When a person with asthma is exposed to one of his or her triggers, the inflammation worsens and symptoms begin:

- The list of possible triggers of asthma is lengthy and varied.
- Each individual with asthma has his or her own specific trigger or set of triggers.
- These triggers generally are related to the way we breathe or the condition of the atmosphere we breathe in.
- Triggers include contaminants in the air, such as smoke, pollution, vapors, dust, or other particles; respiratory infections, such as colds and flu (viruses); allergens in the air, such as molds, animal dander, and pollen; extremes of temperature or humidity; and emotional stress.

Exercise is a common trigger of asthma attacks:

- Exercise can even induce an asthma attack in people who have no other triggers and do not experience asthma under any other circumstances.
- People with exercise-induced asthma are believed to be more sensitive to changes in the temperature and humidity of the air.
- When you are at rest, you breathe through your nose, which serves to warm, humidify, and cleanse the air you inhale to make it more like the air in the lungs.
- When you are exercising, you breathe through your mouth, and the air that hits your lungs is colder and drier. The contrast between the warm air in the lungs and the cold inhaled air or the dry inhaled air and moist air in the lungs, can trigger an attack.

Once the attack is triggered, the airways begin to swell (bronchospasm) and secrete large amounts of mucus:

- The swelling and extra mucus partially block or obstruct the airways. This makes it more difficult to push air out of your lungs (exhale).

- When asthma is left untreated and the inflammation persists, permanent narrowing of the airways can occur. If this happens, this chronic asthma can also be referred to as chronic obstructive pulmonary disease (COPD), like emphysema and chronic bronchitis.

For some forms of asthma, it is important that chronic maintenance medication are used to prevent the development of COPD. Asthma cannot be cured, but it can be controlled by medication. Fortunately, in those with only exercise-induced asthma (EIA), maintenance therapy is often not required and medication can simply be taken before exercise.

- With appropriate treatment, almost everyone with EIA can enjoy the mental and physical benefits of regular exercise.
- The large number of elite athletes who have asthma attests to the effectiveness of asthma medication.
- Whether you walk around your neighbourhood or run marathons, asthma doesn't need to stop you from reaching your exercise goals.

Exercise-Induced Asthma Causes

Asthma has two components: the underlying chronic inflammation and the periodic attacks. We do not know for certain what causes the underlying inflammation. What we do know is that the tendency to have asthma runs in families and that some people are born with the tendency to have asthma.

We do know that exposure to a trigger causes asthma attacks. In exercise-induced asthma, that trigger is rapid movement of air into the lungs before it is warmed and humidified. This often occurs because of mouth breathing during exercise.

The attack is similar in many ways to an allergic reaction:

- An allergic reaction is a response by the body's immune system to an "invader." That invader can be a substance or anything that the body senses as "different."

- When the cells of the immune system sense an invader, they set off a series of reactions that help fight off the invader.
- It is this series of reactions that causes the inflammation that leads to the production of mucus and bronchospasm. These responses cause the symptoms of an asthma attack.
- Because asthma is a type of allergic reaction, it is sometimes called reactive airway disease.

Sports and games that require continuous activity or are played in cold weather are most likely to trigger an asthma attack:

- Long-distance running
- Basketball
- Soccer
- Hockey (ice and field)
- Cross-country skiing

Sports that are less likely to trigger an asthma attack are those that require short bursts of activity interspersed with breaks:

- Walking
- Recreational biking (not racing)
- Hiking
- Swimming
- Short-distance running and track/field events
- Baseball or softball
- Golfing
- Football
- Volleyball
- Wrestling
- Gymnastics
- Downhill skiing

Exercise-Induced Asthma Symptoms

Symptoms usually begin about five to 20 minutes after beginning to exercise. The symptoms often peak about five to

10 minutes after stopping exercise then gradually diminish. The symptoms are typically gone within an hour, but they may last longer.

Symptoms include one or a combination of the following:

- Coughing
- Wheezing
- Chest tightness
- Chest pain
- Prolonged shortness of breath
- Extreme fatigue

Symptoms of asthma may be more subtle in children:

- Children may complain of not being able to keep up with peers in games and sports.
- They may say they don't like games or avoid participating.
- This can lead to problems with socialization or self-esteem in some children.

When to Seek Medical Care

If you think you or your child may have exercise-induced asthma, promptly make an appointment with your health-care professional. If you or your child has exercise-induced asthma, you should have an action plan worked out in advance with your health-care professional. This plan should include instructions on how to prevent an attack while exercising, what to do when an asthma attack occurs, when to call the health-care professional, and when to go to a hospital emergency department.

The following is an example of an action plan in case of an exercise-induced attack:

- Take two puffs of an inhaled beta2-agonist (a rescue medication) with one minute between puffs. If there is no relief, take an additional puff every five minutes. If there is no response after eight puffs, which is 40 minutes, your health-care professional should be called.

- Your health-care professional should also be called if you have an asthma attack when you are already taking oral or inhaled steroids or if your inhaler treatments are not lasting four hours.
- Keep in mind that these are general guidelines only. If your health-care professional recommends another plan for you, follow that plan.

Although asthma is a reversible disease, and treatments are available, people can die from a severe asthma attack:

- If you are having an asthma attack and have severe shortness of breath or are unable to reach your health-care professional in a short period of time, you must go to the nearest hospital emergency department.
- Do not drive yourself to the hospital. Have a friend or family member drive. If you are alone, immediately call for emergency medical transport.

EXAMS AND TESTS

If you are having an asthma attack, your health-care professional (whether your primary-care provider or an emergency-department physician) will ask you questions about your symptoms, medical history, and medications. Answer as completely as you can. He or she will also examine you and observe you as you breathe.

He or she will assess the severity of the attack. Attacks are usually classified as mild, moderately severe, or severe.

This assessment is based on several factors:

- Symptom severity and duration
- Degree of airway obstruction
- Extent to which the attack is interfering with regular activities

If you have had symptoms and are seeking medical care afterwards, the health-care professional will ask questions and perform tests to search for and rule out or exclude other causes

of the symptoms. The evaluation will almost certainly include tests of how well you can breathe at rest and may include tests during exertion. These tests are done at rest, after six to eight minutes of exercise, and then at regular intervals until at least 30 minutes after you have stopped exercising. Proper diagnosis is essential to ensure that the most appropriate treatment is given.

Measurements of how well you are breathing can be assessed using the following methods:

- *Spirometry:* The spirometer is a device that measures how much air you can exhale and how forcefully you can breathe out. The test may be done before and after you inhale a medication. Spirometry is a good way to see how much your breathing is impaired during an attack. This test must be done in the medical office; you may exercise on a treadmill or stationary bicycle.
- *Peak flow meter:* This is another way of measuring how forcefully you can breathe out during an attack. This device is small and portable and can be used "in the field." This allows testing after six to eight minutes of your usual activity.
- *Oximetry:* A painless probe, called a pulse oximeter, may be placed on your fingertip to measure the amount of oxygen in your bloodstream.

No blood test can pinpoint the cause of asthma:

- Your blood may be checked for signs of an infection that might be contributing to the symptoms.
- In severe attacks, it may be necessary to sample blood from an artery to determine exactly how much oxygen and carbon dioxide are present in your bloodstream.

A chest x-ray may also be taken. This is mostly to rule out other conditions that can cause similar symptoms. In many instances, the history is the most important clue to the diagnosis of exercise-induced asthma. Oftentimes, armed with this

information, the health-care professional will empirically trial a medication for exercise-induced asthma. Follow-up visits will then determine if this medication was effective in reducing the symptoms associated with exercise.

Exercise-Induced Asthma Treatment

Since exercise-induced asthma is a chronic disease, treatment goes on for a very long time. Some people have to use medication for the rest of their lives. The best way to improve your condition and live your life on your terms is to learn all you can about your asthma and what you can do to make it better.

- Become a partner with your health-care professional and his or her support staff. Use the resources they can offer information, education, and expertise to help yourself.
- Follow the treatment recommendations of your health-care professional. Understand your treatment. Know what each drug does and how it is used.
- Visit your health-care professional as scheduled.
- Promptly report any changes or worsening of your symptoms.
- Report any side effects you are having with your medications.

The goals of treatment are as follows:

- To prevent attacks
- To carry on with normal activities
- To maintain normal or near-normal lung function
- To have as few side effects of medication as possible

Self-Care at Home

Work with your health-care professional to develop an action plan. Follow your treatment plan closely to avoid an asthma attack during and after exercising. If you do have an asthma attack, the

action plan will help you control the attack and make the decision about when to seek medical care. If you should have an asthma attack, move to the next step of your action plan.

Keep the following tips in mind:

- Take only the medications your health-care professional has prescribed for your asthma. Take them as directed.
- If the medication is not working, do not take more than you have been directed to take. Overusing asthma medications can be dangerous.
- Do not take cough medicine. These medicines do not help asthma and may cause unwanted side effects.
- Aspirin and nonsteroidal antiinflammatory drugs, such as ibuprofen (Advil, Motrin), can cause asthma to worsen in certain individuals. These medications should not be taken without the advice of your health-care professional.
- Do not use nonprescription inhalers. These contain a very short-acting inhaler that may not last long enough to relieve an asthma attack and may cause unwanted side effects.
- Do not take any nonprescription preparations, herbs, or supplements even if they are completely "natural," without talking to your health-care professional first. Some of these may have unwanted side effects or interfere with your medications.
- Be prepared to go on to the next step of your action plan if necessary.

If you think your medication is not working, let your health-care professional know immediately.

Medical Treatment

Most people with exercise-induced asthma, if exercise is their only trigger, do not have to take medication every day (unless they exercise every day). Medication is taken before exercising, each time you exercise, to prevent an attack.

- The medications most widely used by people with exercise-induced asthma are the short- and long-acting beta₂-agonist bronchodilator inhalers.
- Other preventive medications are inhaled cromolyn sodium, such as Intal, and oral leukotriene inhibitors, such as montelukast (Singulair).

Precautions that may help reduce your chance of having an asthma attack include the following:

- Spending time warming up before starting strenuous exertion can help prevent asthma symptoms. Similarly, a gradual cooling down after exertion can prevent symptoms after exertion.
- Avoid exertion when you have a respiratory tract infection, such as a cold, flu, or bronchitis.
- Avoid exertion in extremely cold weather.
- If you smoke, quit.
- If you have allergies, avoid exertion when a reaction is likely to be triggered, as when the pollen count is high or the pollution index is high.

If you have frequent exercise-induced asthma attacks despite using preventive medication, or if you have attacks when you are not exercising, you need to see your health-care professional right away.

You may need to use daily medication to control the underlying inflammation that is causing your frequent attacks. Together, you and your health-care professional will develop an action plan for your particular situation in case of asthma attack.

The action plan will include the following:

- How to use rescue medication
- What to do if the rescue medication does not work right away
- When to call the health-care professional
- When to go directly to a hospital emergency department

Medications

Inhaled, short-acting beta2-agonist bronchodilators are the medications most often used to prevent asthma attacks in exercise-induced asthma.

- Use two to four puffs five to 30 minutes before exercising. The medication works best if taken just before exercising.
- This class of drugs is chemically related to adrenaline, a hormone produced by the adrenal glands.
- Inhaled beta2-agonists work rapidly (within minutes) to open the breathing passages. They relax the muscles of the breathing passages, dilating the passages and decreasing the resistance to exhaled airflow, making it easier to breathe.
- They are effective in about 80 per cent-90 per cent of people with exercise-induced asthma.
- The effects last as long as four to six hours.
- They have no effect on the underlying cause of the asthma attack.
- They can also be used to relieve symptoms if an attack occurs.
- Side effects include rapid heartbeat and shakiness.
- Albuterol (Proventil, Ventolin) is the most frequently used beta2-agonist medication.

Longer-acting (12-hour) beta2-agonist inhalers, including salmeterol (Serevent) and formoterol (Foradil) are also available. These are more convenient for some people. For example, a child can use the long-acting inhaler before going to school in the morning to prevent an asthma attack during physical education class or recess.

Inhaled corticosteroids such as beclomethasone (Qvar), fluticasone (Flovent), and mometasone (Asmanex) are also effective therapy for exercise-induced asthma. For effect, these work better if taken a few hours before exercise.

Next Steps

Follow-Up

Asthma is a long-term disease, but it can be managed. Your active involvement in treating this disease is vitally important.

- Take your prescribed medication(s) as directed.
- If you smoke, quit.
- See your health-care professional regularly according to the recommended schedule.
- By following these steps, you can help minimize the frequency and severity of your asthma attacks.

Prevention

Treatment in exercise-induced asthma is focused on preventing or minimizing asthma attacks. If you take your prescribed medication as directed, you should be able to exercise without asthma symptoms.

Prognosis

Most people with exercise-induced asthma are able to control their condition if they work together with a health-care professional and follow their treatment regimen carefully. People who do not seek medical care or do not follow an appropriate treatment plan are likely to experience worsening of their asthma and deterioration in their ability to function normally.