We applaud our sportsmen as we see them smiling ecstatically on the podium, draped in the national colours. We get misty-eyed as we see them kiss their hard-earned medal as the national anthem plays. What we do not see are the sacrifices the sportsmen made on the way to the podium. We do not see the gruelling training schedules, the blistered palms from tightly gripping bat or racquet handles, the mauled muscles, the torn tendons and the excessive wear and tear leading to battered bodies.

One does not get to become a champion without undergoing regular and rigorous training over an extended period of time. Athletes, in particular, begin training at a tender young age when they are most supple. Nadia Elena Comaneci, the first gymnast ever to be awarded a perfect score of 10 in an Olympic gymnastic event (aged 14) was five years old when she began training. Gymnast Dimitrios Loundras, Bronze medallist at the 1896 Summer Olympics in Athens, was just over 10 years old at the time. He remains the youngest Olympic medallist till date. These are just two examples from innumerable others in the arena of sports.

Of course, if one trains rigorously over extended periods there is always the chance that overuse and strain-related injuries may surface. In addition, contact sports increase the chances of accident-related injuries, while sports that involve overuse of a particular part of the body often lead to chronic injuries. Accidents, poor training practices, improper equipment, lack of conditioning, or insufficient warm-up and stretching can all lead to injuries sustained while indulging in one’s favourite sport.

It is through a disciplined regimen of exercise and by building up their bodies to stretch beyond limits and regular practice that sportspersons are able to make their presence felt at the highest level of sporting events. Yet, sports injuries are very much part of the game and could strike any sportsperson.

The world has not forgotten the riding accident that paralysed Superman actor Christopher Reeves in May 1995. His thoroughbred horse balked and pitched him forward.
Injury and Sports: Going Hand in Hand

Injury-rates, expressed as injuries experienced per hour of activity, are indicators of just how injury-prone a particular sport is. Rates above 5 injuries per 1000 hours of activity are considered high. According to reports, sports such as rugby and lacrosse result in about 30 injuries per 1000 hours of activity. About a third of all injuries suffered by rugby players are head and neck injuries, 59% of which are suffered while tackling or being tackled. Of course, injuries while playing rugby and lacrosse are often the result of impacts with other players – or with their equipment. Basketball and squash result in 14 injuries per 1000 hours. Running scores about 11 injuries per 1000 hours. A research paper in *Nature* on spinal injuries reports that injuries sustained as a result of horse riding are common with serious injuries to the nervous system being the most dangerous.

There also appear to be some differences between the injuries suffered by men and women participating in the same activity. A recent study in the US found that when it came to weightlifting, women were more likely to injure their feet and legs, while men’s injuries were more common in the trunk and hands; men had more sprains (overstretched ligaments) and strains (overstretched tendon/muscle), and women had more fractures (broken bones).

The risk factors that lead to injury are usually classified as: Extrinsic (outside the body) and Intrinsic (pertaining to the body).

Impact or traumatic injuries happen when there are collisions. Impact-related injury is called acute injury. Fractured bones are acute injuries. A cricket ball hitting the batsman may result in cracked ribs and a ricocheting squash ball may seriously hurt the eye on contact. In alpine skiing, collisions account for 90% of all fatalities; trees are the most commonly struck objects (~ 60% of all fatalities) and collisions with other persons account for ~10% of the fatalities. Weightlifters often injure themselves by dropping weights on themselves or crushing a body part between weights.

Accidents usually happen so suddenly and so swiftly that there is little a player can do to prevent them. For example, the racing car may spin out of control, hit a barrier, overturn and burst into flames. Brazilian racing car driver Ayrton Senna da Silva, one of the greatest drivers in the history of Formula One, died after sustaining severe injuries to the head in a crash while leading the 1994 San Marino Grand Prix. Tragically, the same event had also seen the death of his friend Roland Ratzenberger from skull fracture in another crash.
Signs of acute injury are:

- Sudden, severe pain accompanied by swelling
- Not being able to place weight on the affected body part
- Feeling of tenderness in affected area and/or inability to move a joint
- A bone that is visibly out of place; maybe even protruding out of the skin.

Overuse injuries occur over time, and are a result of identifiable reasons, and so can often be prevented. The injuries that a person may suffer while running, cycling, swimming, stair climbing, and walking are not due to impact, but usually, because of overuse.

Injury that manifests usually as pain over time is most likely to be overuse injury and is called chronic injury. Being “punch-drunk” an apt, if colloquial description of Dementia pugilistica, which is a type of neuro-degeneration (seen in boxers or athletes who suffer concussions), is an example of chronic injury. Archery is a non-contact sport that involves simple graceful movements, not violent impact (apart from the minimal risk of a stray arrow hitting someone). Yet, the archer needs to maintain a constant draw on the bowstring, putting the rotator cuff muscles under constant strain. The action of holding the string back puts additional stress on these muscles, leading to the potential for chronic strains.

An archer also needs to keep the aim steady and so the shoulder muscles tend to get stressed.

Signs of chronic injury are:

- Pain when playing/exercising
- Swelling

Vulnerable Areas

Usually, one tends to associate the back and the limbs with sports-injury. However, there is hardly a part of the body that is not vulnerable to injury if care is not exercised. Front teeth, for example, are particularly vulnerable to impact injuries in contact sports such as rugby, football, hockey and boxing.

Head and Neck Injuries

Head injuries, if severe enough, can kill instantly. In 1998, promising cricketer Raman Lamba died after being hit on the head with a cricket ball. In 2009, veteran cricket umpire Alcwyn Jenkins died after being hit on the head by a ball as he oversaw a match.

Injuries that “snap the neck” can have equally tragic results. The world has not forgotten the riding accident that paralysed Superman actor Christopher Reeves in May 1995. His thoroughbred horse balked and pitched him forward.
Reeves landed head first, fracturing the uppermost vertebrae in his spine. He was instantly paralyzed from the neck down. Only prompt medical attention saved his life. During the Seoul games in September 1988, Greg Louganis cracked his head on the diving board as he attempted a dive. He was lucky not because he came back to win two gold medals the next day but because he got off relatively lightly. Divers have been known to have died or rendered quadriplegics in diving-accidents that hurt their heads.

Hits to the head may lead to internal bleeding. Accumulation of blood or bleeding inside the brain tissues leads to hematoma. A violent hit to the head may even lead to concussion. If this injury is recurrent or severe, brain damage can occur. If the head experiences an abrupt jerking motion, a whiplash injury may result. Whiplash injuries are often seen in racing car drivers, divers, practitioners of martial arts and, sometimes, in football/rugby players.

Back Injuries
Injuries to the back usually happen when the back muscles are twisted or overexerted. Lifting or bending incorrectly leads to damage to the back. Traumatic fractures, stress fractures, sprains, contusions, and strains are all conditions that characterise back injuries. These injuries usually dog football/basketball/ice hockey players, gymnasts, figure skaters and weight lifters.

Arm, Hand and Wrist Injuries
Dislocations, fractures, and sprains result because of a fall that forces the fingers or hand backward. These may also be caused by a direct hit. Such injuries are often seen in contact sports, for example, lacrosse, football, and hockey. Cricketers may suffer impact injuries, such as broken fingers when taking a catch.

Tennis elbow is a painful condition that got its name from the fact that many tennis players were affected by it. It is caused by overuse/repetitive strain as a result of repeated extension (bending back) of the wrist against resistance and may affect non-tennis players too. A similar condition is called Golfer’s elbow. Badminton and squash players suffer from both the syndromes although the terms do not include them!

Archers experience “String Slap” when the bowstring is released and it slaps along the forearm on the way back. String slaps cause swelling and bruising because of bleeding under the skin. The constant strain placed on the tendons during archery can lead to inflammation specifically at the wrists, elbows, and shoulders.

Leg, Knee and Feet Injuries
Fractures account for one quarter of all football injuries requiring hospitalization and are almost always impact injuries. However, stress fracture of the lower leg, as seen in runners, is generally considered an overuse injury. Shin splints (pain along the tibia or shin bone, the large bone in the front of the lower leg) are common to those who run marathons.

Running, gymnastics, and volleyball all involve repetitive stress of the foot striking a hard surface. Running creates forces 2-3 times a person’s body weight on the lower limbs. This causes trauma and muscle fatigue; increasing the risk of stress fractures.

Achilles tendon injury results from a stretch, tear, or irritation to the tendon connecting the calf muscle to the back of the heel. It is a common injury among middle and long distance runners. Partial or complete Achilles tendon ruptures are seen in sprinters and those into racquet sports. Fast bowlers are always at risk of muscle strains particularly in the quadriceps and hamstrings. They are also prone to ankle and knee injuries from their run up.

Most sports injuries involving the feet include stress fractures, ligament strains, and heel bruises. The feet support the body’s weight and have to repeatedly absorb a lot of...
force leading to chronic injuries. Athletes who injure their feet often describe tingling, burning, numbness or pain under the heel. Ankle injuries are usually caused by stretching and tearing of the ligaments. Practitioners of martial arts are prone to ankle injuries. The toes seem to be insignificant body parts but Turf toe or pain at the base of the big toe can bring an athlete down. The injury usually results from excessive upward bending of the big toe joint and is usually the result of practicing on a hard surface. Sudden use of a muscle as when executing an overhead smash, in tennis or badminton, may result in the disruption of muscle fibres and lead to pain, swelling, and even loss of function for a while.

The knee is another vulnerable area. Pain in the knees is connected to overuse when repetitive small stresses are not allowed to recover adequately. Knees may suffer sprains, strains, damage to cartilage and of course, damage due to overuse. Any activity that calls for stopping, with quick changes of direction, puts the knees under pressure. Footballers therefore often suffer knee pain. In squash, for example, frequent twisting and lunging is required which places a lot of stress on the knees. Sudden twisting movement of the knee while playing badminton or tennis sometimes results in the tear of the meniscus. About one third of all alpine ski injuries affect the knee joint. Pain or tenderness close to or under the kneecap at the front or side of the knee is called Runner’s knee! It is clear from the name that long distance runners suffer chronic knee pain. Cyclists do too.

**Groin Injury**

The groin area involves the musculo-skeletal, gastro-intestinal, genito-urinary systems, and neuro-vascular structures. Pain in this area is called Athletic pubalgia, or sportsman’s hernia. Soccer and Ice hockey players often experience debilitating groin pain. Gilmore’s groin hernia (a sort of sports hernia) or groin disruption in athletes was recognized as a medical condition by Jerry Gilmore in 1980 and he developed a surgical procedure to treat it.

**Treating Sports Injuries—The RICE Way**

Rest, Ice, Compression, and Elevation (RICE method) is used to treat most sports-related injuries. In addition, non-steroidal anti-inflammatory drugs (NSAIDs) such as Aspirin, Ibuprofen, and Ketoprofen are prescribed to reduce swelling and pain. The injured limb is often immobilized using slings, splints or casts. Sometimes, surgery may be needed to take care of torn tendons/ligaments or broken bones.

Rehabilitation is an important part of recovery. It involves exercises that slowly encourage the injured area to get back to normal. Initially the injured limb is coaxed into exercising gently and passing through a range of motions. Later, weights may be used to strengthen the injured area. Care must be taken when scar tissue (normal healing process) starts to form.

**Prevention Strategies**

It is almost impossible to totally prevent all sports-related injuries. However, it is definitely possible to reduce the number of injuries and to minimise the damage caused.

Most contact games have evolved their own safety gear that is designed to protect. It is advisable to wear helmets, protective pads on knees, elbows etc.

Warming up before the actual game slowly acclimatises the muscles and tendons to the impending stress and strain. It is equally important to cool down after the game.

Apart from respecting the rules of the game, it is also important not to overdo it. Sportsmen should realize their body’s limits and gradually build up exercise level allowing the body adequate time to recuperate. It is also advisable not to play when injured/recovering.

Sports medicine is a sophisticated and specialized branch of medicine and most teams/individual players, irrespective of the sports, have their own medical advisors. On a lighter note, it can be said that perhaps chess is the only sports activity that is not plagued by injuries since it is largely contemplative in nature. Except for the odd broken nail once in a while and what is jocularly reported as temporary blindness leading to non-observance of the opponent’s winning move, the world of chess appears to be happily injury-free.

Of course, the sports fan must be prepared to face at least one virtual injury from time to time—a broken heart! It happens when the side supported, faces defeat. The way to prevent this is to cultivate sportsman’s spirit and learn to accept defeat with grace, not rage.

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