The effects and implications of using ergogenic aids for exercise and sports perf...

Health & Medicine

Throughout the history of sport, ergogenic aids have always been taken to enhance performance at sport. However, in more recent times physiological knowledge has improved and there are many more ergogenic aids becoming available for athletes. Some of these aids are legal and some are illegal. Therefore, when working as a coach, it is important to know which are legal and which are illegal so that you can avoid any risk of your athlete being prosecuted.

One ergogenic aid that is prohibited is blood doping. This practice involves the athletes taking a certain amount of blood out of their body and frozen. Their bodies will then make up for this blood loss and after that process is complete, the blood that they took out is injected back into them. This process has a positive effect on sports performance as the number of red blood cells in your body is increased. Blood doping is most commonly used by endurance athletes, such as distance runners, skiers and cyclists. By increasing the number of red blood cells within the blood, higher volumes of haemoglobin are present. Haemoglobin binds to and carries Oxygen from the lungs and to the muscles where it can be used for aerobic respiration. Blood doping therefore allows extra Oxygen to be transported to the working muscles, resulting in a higher level of performance, without the use of the anaerobic energy systems.

However, there are also many side effects to blood doping. Re injecting blood can cause many problems. Firstly it can easily cause infection to the athlete which can result in heart problems such as a heart attack. It can also cause blood clots in the body which can be fatal, jaundice which is the skin, eyes and body fluids turning yellow.

One example of blood doping being used was at the winter Olympics. Six Austrian skiers had all been found to be using to using blood doping in an attempt to improve in the cross country skiing event. The skiers were called Wolfgang Perner and Wolfgang Rottmann and the cross-country skiers Martin Tauber, Jurgen Pinter, Johannes Eder, Roland Diethart and Christian Hoffmann. This particular event is an aerobic event as it lasts for a long time, with the competitors covering huge distances. Therefore the extra red blood cells in their bodies would have meant that they were able to go on much longer and faster than they would normally be able to. As a punishment, all six skiers were banned for life from the Olympics

A second example of a prohibited ergogenic aid in sport is diuretics. Diuretics are banned in sports because they can help with weight loss and could also be used to speed up the elimination of drugs from the system. This can be very helpful to athletes competing in many different sports such as boxing, horse racing or rowing. One example would be a boxer that has put on weight between fights and is therefore too heavy for the weight category they are fighting in. Diuretics would help them to lose weight much more quickly than by natural means and they would be able to pass the weigh in.

They help the sportsperson lose weight by increasing the volume of urine produced by promoting the excretion of salts and water from the kidney. This results in them losing a lot of water through urine, which causes them to lose weight very quickly. The second reason they are banned is, if you take a banned substance that is excreted through urine, it could speed up the elimination of drugs from the system. If it is being used in this way, it is not

so much an aid to improve performance but could cover up for another prohibited aid.

There are two main side effects to diuretics that damage a persons performance levels in sport. The first of these is dehydration. Diuretics work by removing all excess water and this means that dehydration often occurs. This will immediately have an effect on sports performance. Firstly, blood will become thicker and therefore more difficult to pump around the body, resulting in less oxygen being carried through the blood to the muscles. The body will then overheat due to an inability to sweat because of dehydration. Finally, Waste products such as lactic acid are not discreeted due to water conversation. A second effect on sports performance is muscles weakening, which is very important for sports people such as boxers. This is due to the poor blood supply to muscles.

An example of the consequences that diuretics can cause is in boxers. They used to have the weigh in on the day of the fight. This meant that any boxer using diuretics would have to use them on the same day as they were fighting. The diuretics would get rid of any excess water in the body but the problem was that it took away the layer of water between the skull and the brain. This layer of liquid protects the brain from hitting the side of the skull when knocked. Therefore, without this protection, many boxers developed brain damage after years of boxing.

Another prohibited ergogenic aid is beta blockers. Beta blockers are banned in many sports due to their ability to slow the heart rate. It is precision sports

such as snooker, darts and diving that they improve performance in as they give you more control over slight movements.

Beta blockers are normally given for the treatment of angina, high blood pressure, irregular heart beats or following a heart attack. They act by interfering and inhibiting certain nerve impulses being transmitted through the nervous system. They act by reducing the demand of oxygen required by the heart, lower heart rate and reduce the production of adrenalin.

There are many possible side-effects of these drugs, but some people may not suffer from any. Possible effects include dizziness and fainting caused by the medications lowering heart rate too much and blood vessels can narrow causing cold and pale fingers and toes.

On the other hand, there are also permitted ergogenic aids. This means that they can improve sports performance, but are still allowed by governing bodies of sports. One example of this is altitude training. Altitude training is very useful to any sports people that are competing in aerobic events. Many long distance runners either come from countries at high altitude or move there to train.

Altitude training works because when the athlete trains at high altitude, there is very little oxygen in the air. The body soon adapts to this change of oxygen available and produces more red blood cells than normal. This means that there is increased haemoglobin levels in the blood that aren't lost when the athlete returns back to lower altitude to compete. These

effects usually last for about two weeks after altitude training and result in much better endurance levels.

There are very few side effects to altitude training as long as athletes do not over train themselves at altitude. It has been scientifically proven to have positive effects on performance.

Altitude training is proven to have a positive effect on sporting performance b the Kenyan long distance runners. For years they have dominated all long distance running events. Kenya is at a very high altitude and the effects that the athletes get from training in their home country is proven in the times on the track.

Another permitted ergogenic aid is psychological techniques. The increasedstressof competitions can cause athletes to react both physically and mentally in a manner that can negatively affect their performance abilities. They may become tense, their heart rates race, break into sweat, worry about the outcome of the competition or find it hard to concentrate on the task in hand.

There are many different psychological techniques that can be used to combat these effects on the body. These include imagery techniques, relaxation techniques and goal setting. There are three psychological factors which athletes must have control over to improve performance. These are confidence, control and commitment.

Confidence is improved through mental imagery. Using imagery, the athlete is able to imagine a previous good performance, remembering how they felt

and acted. It also allows you to imagine yourself winning at the end, feeling like you have already been in the same situation and improving confidence. Control is improved through relaxation techniques. An example of a relaxation technique is through meditation. If athletes complete meditation before competing, they will be able to be much more relaxed and have control over what they are doing. The final technique that athletes can use is goal setting, which can improve commitment in sport. If they are given something to aim for, with multiple small aims along the way, they are more likely to complete any objectives they have.

There are no side effects to psychological techniques as long as they have the necessary skills to complete them.

An example of psychological skills improving performance in sport is through Johnny Wilkinson. Whenever he is kicking a conversion, he pictures an elderly woman standing at the other side of the goal posts that catches the ball. This improves confidence and concentration as it makes the task at hand seem much simpler.

One of the very few drugs that is allowed my governing bodies of all sports is paracetamol. These have been seen to not improve sporting performance and therefore are not banned. However, they could be used to help a performance in certain sports.

Paracetamol work as pain killers. Therefore, any sport that requires its participants to go through pain may benefit from paracetamol. One example of a sport where athletes go through pain in is boxing. If boxers took some

paracetamol before going out to fight, it is possible that it will help cover some of the pain when they are getting punched. They are most commonly used for aches such as head aches so they may also stop the boxers from getting head aches after being punched.

It is not just contact sports however that deal with aches and pains. Nearly all sports at the top level require its participants to push their bodies to their absolute limit and through the pain barrier. A sport such as long distance running for example will cause a lot of aches on the athlete's body and paracetamol will help cover these.

There are very few side effects to paracetamol as they are widely used by everyone to stop pains. This means that we know more about the dangers than we would of a new drug that may be illegal, as it is used by less people. The only danger would be if the athlete took an overdose which could cause serious problems or be fatal.