

The 4 Stages of Injury Management & Treatment

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When dealing with forms of sports injuries, I find it important that my clients understand injury management and the necessary stages in the tissue repair process, as well as treatment strategies. Having an understanding of how tissues heal greatly facilitates the client's recovery process. When injured, failure to act quickly and take the correct form of action could result in further injury and slowing down of the recovery process. It is easy to become complacent and think that injuries get better by themselves, or to think that an injury has totally healed. It is foolhardy to think this way, and is detrimental to effective recovery. This is why it is important to consider the information in the rest of this article.

There are two main types of injuries: Intrinsic and Extrinsic. Intrinsic injuries include muscle 'pulls' or 'tears', repeated excessive movements, or overuse/overload. Extrinsic injuries involve having a collision with external forces. This would include colliding with opposing team players at speed, or falling and colliding with the ground.

The stages in the healing process are as follows:

- The injury phase
- The acute/inflammatory phase
- The repair/regeneration phase
- The remodelling phase

There now follows a more detailed explanation of the 4 phases and timescales, together with a general treatment plan for how to treat

the injury in each of the phases. The timescales and treatment options may change slightly, depending upon the age of the person, severity of the injury, fitness levels and what the injured is actually doing in each phase in terms of their active daily lifestyles. Please note that this is a guideline only. For further advice specific to your problem, please call me to discuss..

The Injury Phase

When an injury occurs, muscles or ligaments are damaged. This causes disruptions of the blood capillaries running through them to also be disrupted and damaged. This causes blood to be released into and around the damaged area.

The first reflex action, lasting anywhere from a few seconds to 10 minutes, due to damage and pain at the damaged area, involves vasoconstriction, i.e. narrowing of the blood vessels in order to help reduce blood loss from the damaged vessels. The body does this automatically.

Damage to the blood vessels cuts off fresh blood from reaching the muscle tissues, therefore preventing oxygen and nutrients from reaching the muscles and cells. The result is that the cells begin to die due to oxygen starvation. An analogy would be a hosepipe which has been punctured, the water of which is therefore cut off from reaching the head of the hose. If the person continues to exercise the rate of tissue death will increase because the demand for oxygen will be high. It is therefore imperative that the injured person slows down and rests in order to slow down the rate of tissue death.

The Acute / Inflammatory Phase

Inflammation occurs following an injury and can last up to 4 or 5 days. Inflammation gives off four external signs: heat, redness, swelling and pain. Heat and redness are due to an increase of blood flow to the damaged area. Swelling is caused by the damaged blood vessels leaking blood into the tissues. The pressure of the swelling against nerves, as well as damaged tissues will result in pain.

Dying cells, due to direct tissue damage and lack of oxygen getting to the tissues, triggers a release of Hystamine, which causes blood vessels to expand (dilate), bringing an increased blood supply and nutrients to the area in order to repair and rebuild damaged tissues. As the pressure increases, plasma is forced through the capillary walls into the interstitial spaces of the areas of tissue around the injury. Specialised white blood cells migrate through the capillaries to the damage area to fight infection and ingest dead cells, in effect clearing the damaged area, in much the same way that a road sweeper clears the roads of debris. As the inflammatory phase continues Fibrin is laid down as a 'mesh' onto the damage area. This 'mesh-like' structure is referred to as a sticky matrix, entrapping debris (dead and dying cells) and platelets to form a blood clot.

Treatment During the Acute stage

The initial actions taken (or not taken) when an injury occurs has a bearing on how long it takes the person to recover. The speed at which bleeding is slowed down and the debris cleared will affect how quickly recovery takes place. The main aim immediately after injury is to aid the narrowing of blood vessels, slow the blood flow and reduce the amount of inflammation. The amount of swelling and blood flow leaking out may be reduced by applying ice. A good rule of thumb is to apply ice for 10 mins every 2 hours. Compression and elevation will also help this. The acronym used is 'PRICE', which stands for Protect, Rest, Ice, Compression and Elevation. Sports massage is not carried out at the acute stage. Sports massage can only be used in this stage in terms of lymphatic drainage in order to reduce swelling, however sports massage treatments are mainly carried out at the repair stage.

The Repair Phase.

The formation of new blood vessels to the injury site is required to supply oxygen and nutrients to the cells of the damaged tissues, with lymphatic vessels providing drainage. Collagen, produced by fibroblasts, begins to be laid down as scar tissue in a sticky mess over the injured area in a haphazard way unless there is enough tensile strength in the muscles so that the collagen is laid down in the direction of the muscle tension. This is why sports massage is so important, because using advanced sports massage techniques enables the scar tissue to be broken down and aligned in the direction of the tensile muscle strength.

Treatment During the Repair stage.

Because the injured area is weak it is important to stretch and strengthen the weak tissues. This may cause some inflammation, so it still may be necessary to apply ice to reduce any possible inflammation. The main aim during this phase is to restore strength to the repairing tissue. Sports massage at this stage is most useful, in terms of realigning the scar tissue and also in improving circulation, stimulating the healing process and reducing swelling.

The Remodelling Phase.

The remodelling phase, the final stage in the healing process, takes place from approximately 3 weeks after injury up to about 1 year. During this phase cell activity starts to return to normal, and scar tissue strengthens along the lines of mechanical stress. Tendons and ligaments have poorer healing qualities and blood supply than muscles and so may take longer to heal.

Treatment During the Remodelling Phase.

Deeper and firmer sports massage techniques are required in this phase in order to stretch the newly formed collagen fibres in the directional force of the muscle fibres. Strengthening exercises should be progressing in this stage because inactivity will lead to weakness, atrophy and loss of muscle strength.

To summarise, when experiencing an injury such as a muscle tear or strain it is important to cease activity to prevent further injury and cell death, apply ice to aid in the reduction of inflammation. After approx. 48 hours see a sports massage therapist in order to begin aligning the scar tissue, increase blood flow and then to begin stretching and strengthening the tissues.

It is also important to consider how the injury occurred in the first place. If muscular imbalance was a factor then it will be a very good idea to find out which muscles are weak so that they can be strengthened to reduce the possibility of further injury in the future.

Moving into the repair and regeneration phase, strengthening of the injured tissues is important as well as sports massage in order to facilitate the healing process, stimulate circulation and realignment of the scar tissue fibres.

For further information, advice and appointments then contact Mike Bell on 07754 937341.

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