WESTWOOD MASSAGE

What factors may influence soft tissue repair?

The Connective Tissue Healing Process

The healing process in connective tissue has four components, the protection phase, the repair phase and the remodelling phase. This last step, the remodelling process, when left on its own can take as little as 3 days, but typically takes 30 days to 2 years, and in some cases never truly reorganizes in a proper pattern.

Soft tissue injuries are commonly categorised depending on the time frame since injury and the healing processes that are occurring at that time.

Acute - Protection Phase

A soft tissue injury is termed as acute from the initial time of injury and while the pain, bleeding and swelling is at its worst. Your body's aim at this point is to **protect** your injury from further damage. The usual time frame for your acute symptoms to settle is two to four days post-injury, but this can vary depending on how you treat your injury.

Sub-Acute - Repair Phase

A soft tissue injury is termed as sub-acute when the initial acute phase makes a transition to repairing the injured tissues. This phase commonly lasts up to six weeks post-injury when your body is busy laying down new soft tissue and reducing the need to protect your injury as the new scar tissue begins to mature and strengthen.

Late Stage - Remodelling Phase

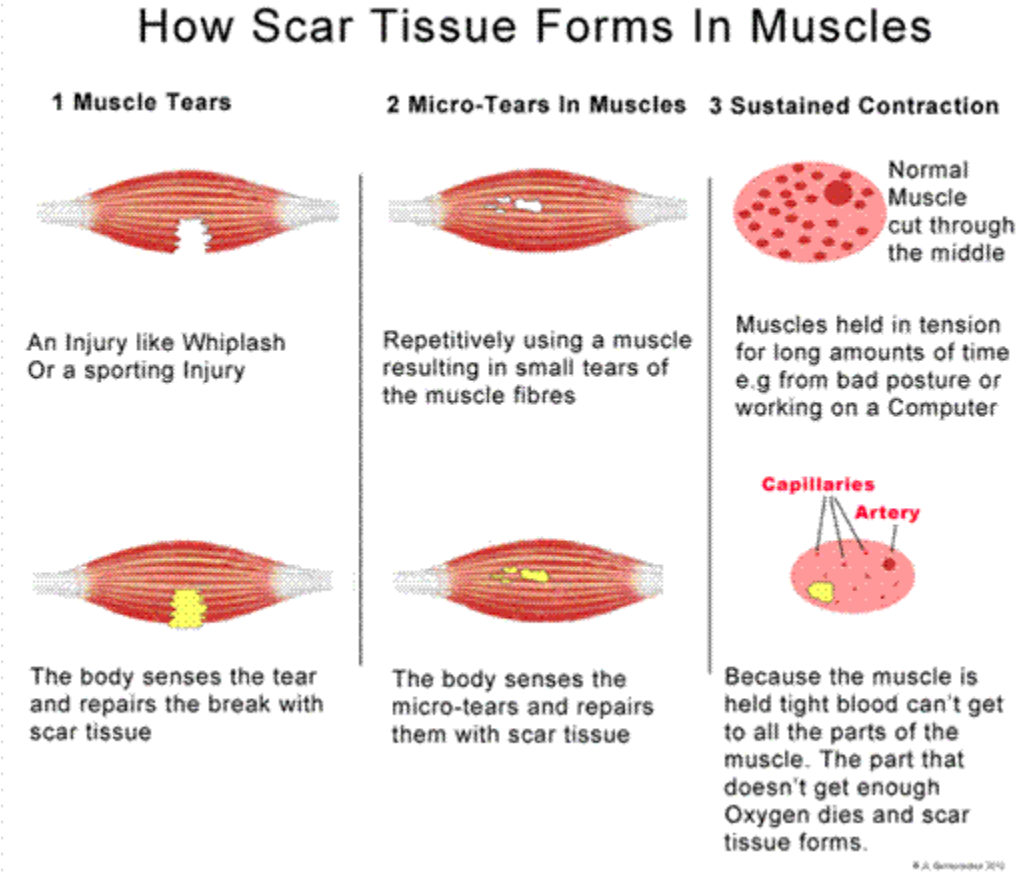
Your body does not magically just stop tissue healing at six week post-injury. Healing is a continuum. At six weeks post-soft tissue injury your healing tissue is reasonably mature but as you stretch, strength and stress your new scar tissue it often finds that it is not strong enough to cope with your increasing physical demand.

When your body detects that a repaired structure is still weaker that necessary, it will automatically stimulate additional new tissue to help strengthen and support the healing tissue until it meets the demands of your normal exercise or physical function.

The period between six weeks and three months post-injury is commonly referred to as the remodelling phase.

Chronic Phase - Ongoing Repair and Remodelling

Beyond three months is referred to as the chronic phase and probably refers mainly to pain that lasts more than 3 months. However, your soft tissue is constantly being injured by your daily activities and workouts, only to magically repair and remodel the tissue to meet your specific exercise demands.



Adhesions

When the phrase scar tissue is mentioned, most people think of external scarring or scars formed from surgery, when this is only a specific type of what could more generally be termed as adhesion formation. Scar tissue or adhesion is most commonly recognized as the fibrous connective tissue that is formed over a damaged area as the body attempts to repair this damaged tissue. The more commonly overlooked sources of adhesion, beyond acute injury, are micro-trauma and hypoxia (lack of oxygen)

Many things will influence **the repair of soft tissue** following injury, these will include:

- The type of treatment received both in the early and later stages

- How much or little rest, active rest activity and stretching has taken place

- The type of rehabilitation programme that has been followed

- Nutrition

- Age

- General health and any underlying pathological problems

- Lifestyle factors

The importance of the inflammation process

Inflammation is a defensive process, caused by the leakage of blood plasma and the migration of immune cells into the area of damaged tissue. All bodily damage, whether caused by injury or infection, consists of broken cells, and when the walls of a cell rupture, an array of molecules which would not otherwise be released, spill out into the surrounding tissue. Some of these molecules trigger the sensory nerves to produce the ongoing, second type of pain just described. The sensory nerves also react by causing the blood vessels to widen, increasing local blood flow (Redness), and making the walls of the blood vessels more permeable. With greater blood flow, more white blood cells, the infantry of the immune system, can be carried to the site of the injury. The greater permeability of the blood vessel walls enables the white blood cells to flow out of the arteries and veins into the surrounding tissue to defend against possible bacterial invaders. If no bacteria have found their way into the wound, particular white blood cells known as macrophages clear up the debris of the chattered cells by engulfing and digesting it. If bacteria have gained a foothold and started to multiply, the white cells form a barrier to create a pus-filled abscess in which the blood fluid, the serum, plays a key role in healing.

Besides clearing up the debris and attacking bacteria themselves, the macrophages also release a number of chemical messengers. These signalling molecules, or cytokines, play a vital role in co-ordinating the acute phase response by facilitating both short-distance communication among the immune cells themselves and long-distance communication between the immune cells at the injured site and the brain.

Signs of inflammation
- Pain
- Redness
- Swelling
- Heat
- Loss of or impaired function

Whilst some swelling is good and is your body's natural way of healing itself too much swelling will push the torn fibres further apart and that will create more scar tissue as it heals. If the swelling is removed, then the fibres will stay closer together, less scar tissue is formed and the injury will heal quicker and better.