

STAGES OF HEALING AND IMPLICATIONS FOR EXERCISE

ACUTE STAGE

1. Inflammation, swelling, heat, altered function, redness, pain.
2. RICE, for the first 48 to 72 hours, but do **not** completely immobilize the injury.
The scar tissue will stick to the other tissues if the injury is completely immobilized.
3. Formation of a strong mobile scar at the site of the injury is the ultimate goal.
Use passive movements, (someone else moves the injured area).
 - The movements should be specific to the body part involved.
 - The intensity should be gentle enough not to cause re-injury.
 - Active movement is not indicated in severe injuries.
(active movement is when the injured person moves the joint.)
4. If movement causes increased pain or an inflammatory response, it is probably too great a dosage too early and it should not be performed.

TREATMENT GOALS

1. Reduction of pain, spasm, edema (swelling).
 - RICE for 48 to 72 hours.
 - Avoid stress to injured area.
2. Reduce scar formation and maintain mobility.
 - Passive movements within limits of pain.
 - Use muscle setting techniques. (concentrate on contracting the muscles surrounding the joint without moving the joint.)
3. Reduce soft tissue and joint swelling.
 - Compression and elevation
 - Electrical modalities, microcurrent, interferential
4. Maintain strength and mobility of the non injured areas as well as the rest of the body.
Use protective splinting as necessary.
 - Resistive exercise to patient tolerance.

STAGES OF HEALING IMPLICATIONS FOR EXERCISE

SUB-ACUTE STAGE

1. Healing progresses, pain and inflammation decrease, though the new tissue is easily injured.
 - Too vigorous of exercise or activities can re-injure the tissue and delay recovery.
 - Motion is necessary to prevent contractures (shortening), and adhesions (sticking), of scar tissue.
2. Atrophy (muscle weakness and wasting) from immobility begins within 72 hours after injury. Muscle strengthening can begin during the sub acute stage but must be within patient pain and tissue tolerance.
 - Sub-maximal isometric (muscle is not moved, just contracted, same length), or isotonic (same resistance to muscle through its range of motion) exercises may be started.
 - Care must be taken to avoid tissue injury.
3. Length of sub acute stage is variable.
Depends on:
 - Severity of the injury
 - Location and extent of injury.
 - Persons pain tolerance
 - Persons general health
4. The exercises must be specific to the type and severity of the injury.

Treatment Goals

1. Reduction of pain, spasm, edema (swelling).
 - Gentle resistive exercises
 - Monitor tissue response to exercise.
2. Increase ranges of motion.
 - Progress from passive to active and resistive range of motion within limits of pain.
 - Gradually increase mobility and resistance to increase mobility of the scar tissue and prevent adhesions.
 - Strengthen all muscles surrounding the injured site.

STAGES OF HEALING IMPLICATIONS FOR EXERCISE

CHRONIC STAGE

Clinical considerations

1. The orientation and tensile strength of the collagen is improved between the sub acute and chronic stages. To continue this improvement, resistive force must be used.
 - Use controlled forces that duplicate or moderately exceed the normal forces on the tissue.
 - Maximum strength of the collagen will develop in the direction of the imposed forces.
 - Abnormal or excessive stresses may re-injure and lead to chronic inflammation of the tissue.

1. Intensity of activity increases as the mobility of the tissue is improved.

2. Usually no pain is experienced with limited range of motion of the part and with mild to moderate loading.
 - Contractures need to be stretched and adhesions broken to avoid chronic pain.
 - Resistive exercise is used to strengthen muscles and restore normal neurological function.

Full functional activity is reached when full unrestricted joint play and adequate muscle strength is attained.

- Full unrestricted joint play is needed to avoid joint trauma in the future.
- Adequate muscle support is required for normal joint function to occur.
- Both joint play and muscle strength should be balanced to achieve full functional restoration.

CHRONIC RECURRING PAIN

If this pain is from an old injury it may be the result of:

- Return to full activity before proper healing has occurred.
- Slight tearing of old healed scar tissue from overexertion or improper healing.

Treatment approaches.

- Treat like a new injury with shortened stages.
- Evaluate the cause of the recurrence; faulty mechanics, technique, discontinuation of exercise program, etc.