Muscle Tears Cheat Sheet

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Categorization

Grade I (mild strain): limited number of fibres, no decrease in strength, full AROM and PROM

Grade II (moderate strain): nearly half the muscle fibres torn, swelling, minor decrease in muscle strength

Grade III (severe strain): complete rupture, severe swelling and pain, complete loss of function

Healing Process

Inflammation Days 1-4	Necrosis/apoptosis of injured fibres, hematoma, phagocytosis, early fibroblast activity to form ECM
Proliferation Days 4-Week 4	Fibroblasts invade ECM. They stabilize tissues and create scaffold for new muscle fibres. Satellite cells activated which stimulate myoblast formation. Myoblasts build new muscle fibres (myotubes)
Remodelling Weeks 4-12	Disorganized matrix into organized matrix, revascularization and muscle innervation occur at later stages

Healing Timeline

MOI

High force or deceleration when in the stretched position

Repetitive or increased motions

Factors Predisposing Muscle Strain

Inadequate warm up

Insufficient joint ROM

Excessive muscle tightness

Fatigue/overuse/inadequate recovery

Muscle imbalance

Previous injury

Faulty technique/biomechanics

Spinal dysfunction

Subjective Questions

MOI?

Loss of sensation? Infection red flags?

What happened after injury? Swelling? Bruising? Redness?

Noise when it happened? Able to play on?

Changes in duration, intensity or freq of activity?

24 hour pattern? WB?

Objective Assessment

Observations	Swelling, bruising, or redness
Palpation	Painful to palpate, may feel tear
AROM/PROM	Pain with AROM but not PROM indicative of muscle injury
Strength	Decrease w movement (Grades II-III)
Functional Tests	Pick up mug, brush teeth, STS, Squats

Early Rehab (0-2 Weeks)

PEACE & LOVE

Immobilization (severity dependent). First few days after injury only.

Gentle mobilization and ROM (midrange), severity dependent. Avoid aggressive stretching.

Gentle massage for scar tissue (avoid for first 24-48hrs).

Isos are analgesic, as not lengthening or shortening but stimulating blood flow (Ferendez, 2015). 4-5x40-60s

Progress to middle stage: minimal pain, AROM 75% normal

Middle Rehab (2-6 Weeks)

Isos warm up into isotonics

Heavy slow resistance

Progress to late: Pain permitting, close to full ROM, strength testing, confidence

Late Rehab (6+ Weeks)

Sport specific & cardiovascular

Isokinetic and plyos

Resistance: 3x week w 24hrs rest and 48hrs within same muscle group, 2-4x8-12

Neuromuscular control: balance and proprioception on rest days

PATS (hammies)

Muscles at Risk

Biarthrodial muscles (greater contraction velocity and greater capacity to change length)

Muscles contracting eccentrically

Muscles with higher % of Type II fibres (fast twitch)

Examples: gastroc, hamstring, quads, hip flexor, hip adductor, erector spinal, deltoid, rotator cuff

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Not published yet.
Last updated 14th October, 2022.