STRAINS p.285

Definition: is an overstretched injury to a musculotendinous unit

Name and describe the 3 classifications of a strain.
Grade 1 – Mild or First degree Strain
- a minor stretch or tear in the musculotendinous unit
- minimal loss of strength
- person can continue activity with mild discomfort

Grade 2 – Moderate or Second degree Strain
- tearing of the musculotendinous unit
- the degree of tear is variable from several fibers to majority of the fibers
- may be a snapping sensation or sound at the time of injury
- palpable gap may be present at injury site
- person will have difficultly returning to activity due to pain and weakness

Grade 3 – Severe or Third degree Strain
- complete rupture of the musculotendinous unit or the boney attachment of the tendon is torn off while the unit remains intact
- there is a snapping sound or sensation at the time of injury
- palpable and often visible gap appears at injury site
- often the muscle shortens and bunches up
- person can not continue activity due to significant pain and weakness

State 2 causes of a strain
1. sudden overstretching
2. an extreme contraction against heavy resistance

4 Contributing factors in causing a strain are:
1. repetitive overuse or overstressing
2. inadequate warm up before activity
3. limited flexibility or fatigue
4. history of previous strains

Please list 3 specific questions you would ask relating to this injury
1. What were you doing at the time of the injury?
2. Is there any functional disability?
3. Have you consulted your family doctor?

What might your client present with? (physical observation)
- antalgic gait if the strain is in the lower limb
- affected muscle is supported by taping, bandages or splints
- antalgic posture
- edema at site of injury
- bruising or redness could be present at injury site
- **When Assessing AF ROM you what would notice with each classification.**

Mild strain – there will be little or no pain through entire ranges
Moderate strain – lengthening of the affected muscle will be restricted due to pain
Severe strain – a severe restriction of movement is likely, total loss of function of affected muscle could be present

List 3 S/S for each classification of a strain

Grade 1 MILD	Grade 2 MODERATE	Grade 3 SEVERE
*Muscle spasm *Point tenderness *Minor muscle weakness *Client may not notice discomfort immediately *Muscle will be stiff the next day	*Decreased function *Point tenderness *Extreme spasming *Rapid inflammation and edema *May be visible bruising *Palpable hollow *Can continue activity with discomfort	*Immediate loss of function *Extreme pain *Inflammation and edema *Visible bruising *Palpable gap in muscle *Snapping sensation at the time of injury

List the approximate healing times for each classification of a strain.

Mild Strain – return to activity with support (elastic bandage) after 2 days
Moderate Strain – several days to several weeks after injury
Severe Strain – immobilization is generally removed at four to eight weeks. Return to activity follows this and may be delayed for up to several weeks due to disuse atrophy

List any contraindication for this injury.

- Testing of grade 2 and 3 strain other than pain free active free range of motion is contraindicated to prevent further injury
- Avoid removing protective muscle splinting in acute stages
- Distal circulation techniques are contraindicated to avoid congestion
- Hot hydrotherapy
- Frictions if the client is taking anti-inflammatories

List the Treatment Goals for each Stage and How to Treat them

ACUTE

- Reduce inflammation
    - Muscle is treated with R.I.C.E.
    - Positioning depends on the area affected
    - Hydrotherapy is cold
- Reduce pain and decrease SNS firing
    - Accustom client to therapist touch
    - Begin on the torso with a relaxational focus to being
    - Client is encouraged to do diaphragmatic breathing
- Treat any compensating structures
    - Unaffected areas are treated first using effleurage and slow petrissage
- Reduce edema
    - Lymphatic drainage techniques to injured limb
    - Nodal pumping to proximal lymph nodes
    - Unidirectional effleurage, stationary circles and stroking are used proximal to injury site

- Maintain local circulation
    - Proximal limb is treated to reduce pain and hypertonicity
    - Effleurage and repetitive petrissage are used
- Reduce but do not remove protective spasm
    - Care is taken to not completely reduce the protective muscle spasm by over treating the tissue
- Maintain ROM
    - Mid range passive ROM is used on proximal joints
- Treat other conditions
    - Treat any other injuries that are present

SUB-ACUTE

- Reduce inflammation
    - Limb is elevated
    - Hydrotherapy is cold/cool
- Reduce pain and decrease SNS firing
    - Begin on the torso with a relaxational focus to being
    - Client is encouraged to do diaphragmatic breathing
- Treat compensating structures
    - Unaffected areas are treated first using effleurage and slow petrissage
- Reduce edema and prevent adhesion formation
    - Proximal lymphatic drainage techniques and proximal nodal pumping
- Maintain local circulation
    - Proximal limb is treated to reduce hypertonicity and maintain drainage
    - Effleurage and petrissage are appropriate
- Reduce spasm
    - Protective spasm is no longer important, GTO release on the affected tendon or agonist contract can be used
- Reduce tripper points
    - Trigger points is muscles that refer to the affected area can be treated with muscle stripping
    - With Gr1 onsite work consists of palmar and finger tip kneading with in clients pain tolerance
    - Gr2 &3 onsite work is restricted to light stroking and vibrations within clients pain tolerance
- Maintain ROM
    - Midrange passive ROM to the onset of pain is used on joints proximal and distal to strain
    - Distal techniques are limited to stroking and muscle squeezing

CHRONIC

- Reduce pain and decrease SNS firing
    - Rhythmic techniques to the trunk and unaffected areas are indicated
- Reduce any chronic edema
    - Fascial glide is used to assess the restrictions
    - Fascial technique is used to treat restrictions using cross hand or ulnar border spreading
    - Proximal lymphatic drainage is require once restrictions have been released

- Reduce hypertonicity and trigger points
    - Proximal limb is treated to reduce any remaining hypertonicity and TPs
    - Repetitive petrissage and effleurage is indicated along with muscle stripping and ischemic compressions
- Reduce adhesions
    - Cross fiber frictions to any remaining adhesions, muscle stripping and fascial techniques are beneficial
- Restore ROM
    - Passive relaxed ROM on proximal, distal and affected joints
- Increase local circulation
    - Distal limb is treated with effleurage and petrissage to increase venous flow

What hydrotherapy would you use in each stage of the injury?

Acute – ice to decrease inflammation

Sub-Acute – contrast to help increase circulation and drainage to reduce the inflammation (begin with small temperature differences)

Chronic – deep moist heat will prepare tissue for treatment and increase local circulation

What types of RemEx would you recommend for this injury?

Acute

Grade 1

- Rest with gentle pain free active ROM of involved joints as soon as possible

Grade 2/3

- Rest with no weight bearing
- Gentle pain free active ROM to distal joints
- Gentle pain free passive ROM to distal joints with caution not to lengthen the injured muscle

Sub-Acute

Grade 1

- Client may perform activities of daily living
- Passive ROM to full range pain free of all affected joints
- Careful isometric strengthening

Grade 2/3

- Active ROM within pain free ranges
- Careful midrange passive ROM, limited by pain level
- Gentle pain free active resisted isometrics

Chronic

Grade 1

- Fully active
- Full passive stretch to muscle
- Contract relax technique is indicated
- Active resisted strengthening exercises

Grade 2

- Careful passive stretches
- Isometrics to begin increasing full length and strength of muscle

List 3 recommendation for Home Care

1. appropriate hydrotherapy
2. self massage
3. appropriate remedial exercise