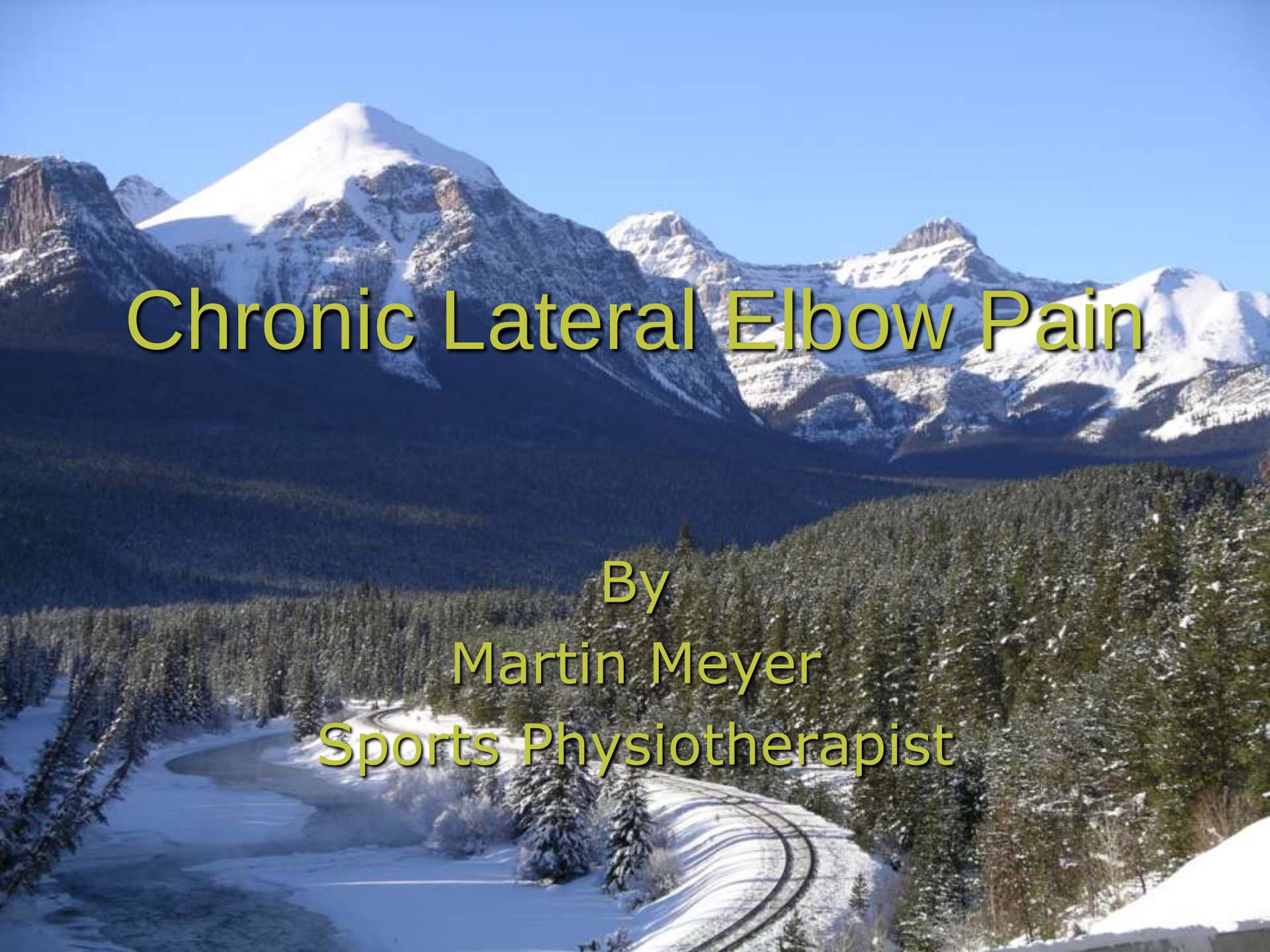


Chronic Lateral Elbow Pain

By
Martin Meyer
Sports Physiotherapist

My background

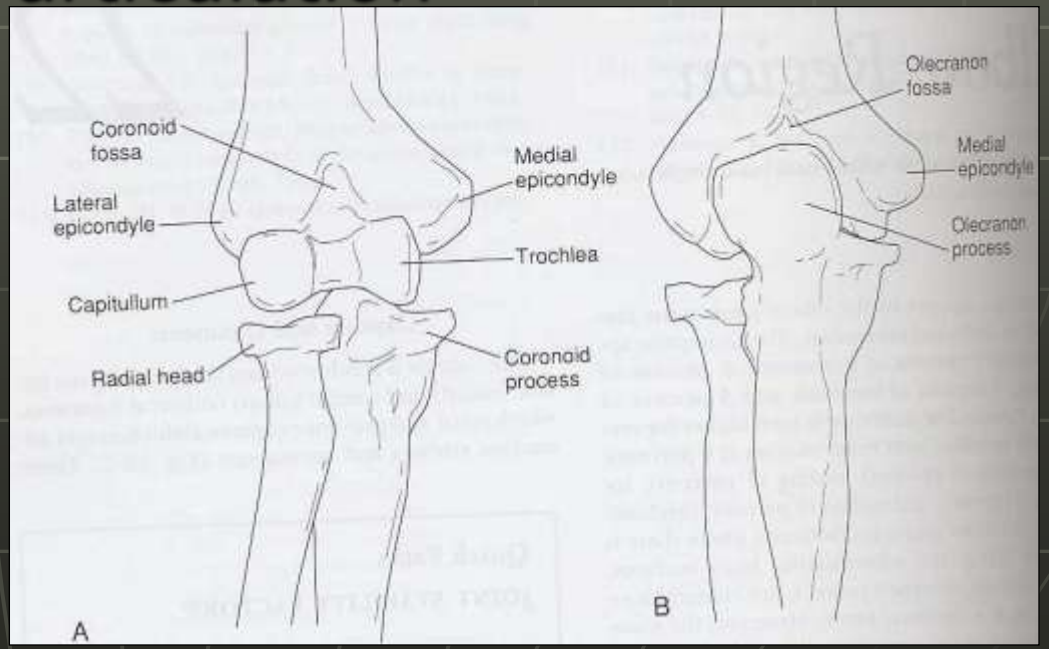
- Graduated in 1996 from Curtin
- Completed Masters in Sports Physio in 2000
- Last 2 years in Calgary, Canada
- Elbows, elbows, elbows….

Aims

- Briefly look at elbow anatomy
- Possible pathogenisis and patho-anatomy of chronic elbow pain
- Physiotherapy techniques
  - Manual Techniques
  - Therapeutic Exercise
  - Taping
- Practical Session

Elbow Anatomy

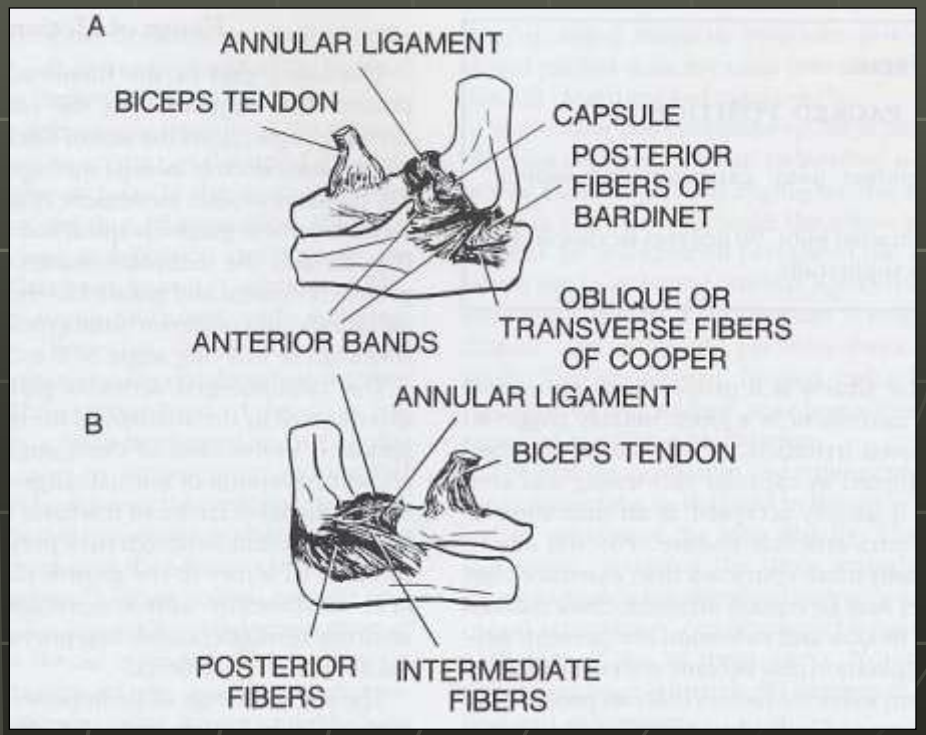
- Arthrology-
  - Multifaceted articulation
  - Humeroradial articulation
  - Humeroulnar articulation
  - Radioulnar



(Reid 1993)

Ligamentous Anatomy

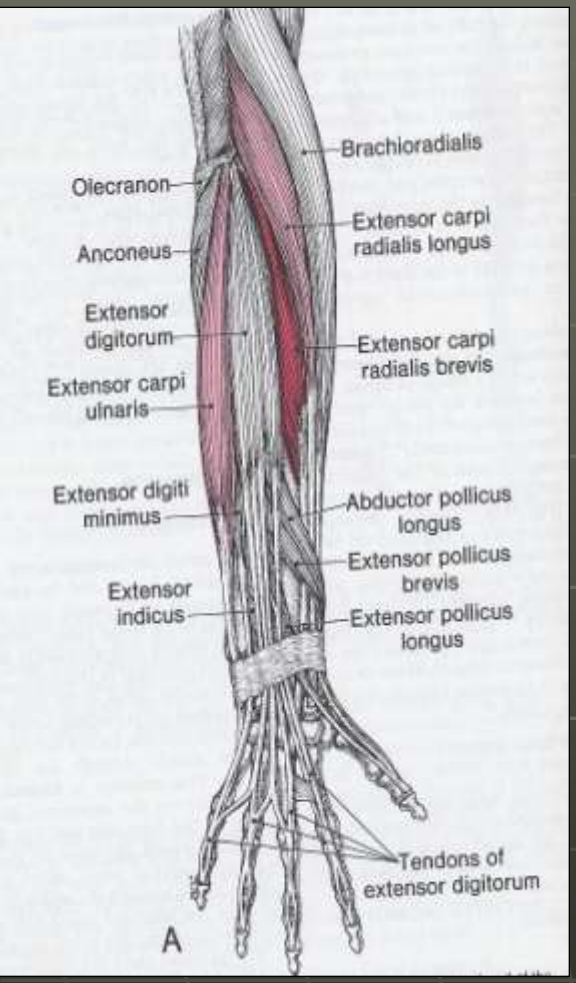
- Ligamentous Anatomy
  - Ulnar collateral
  - Radial Collateral
  - Annular Ligament

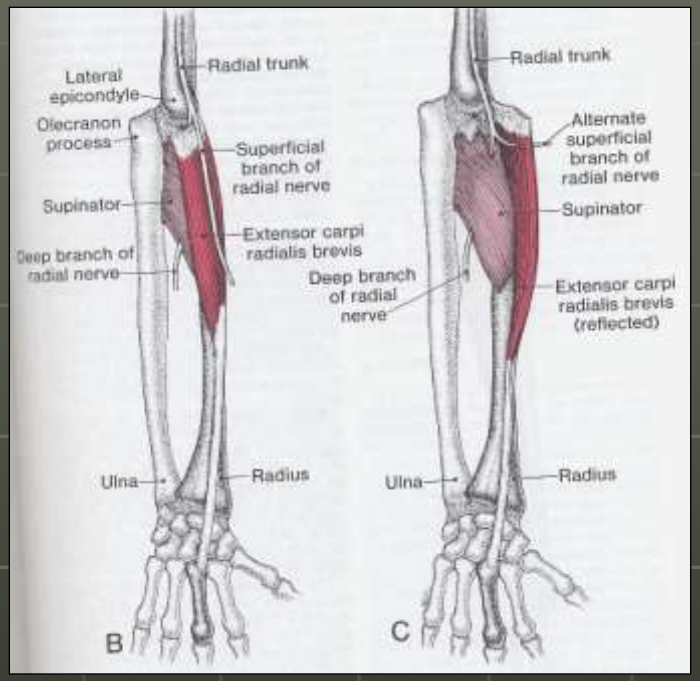


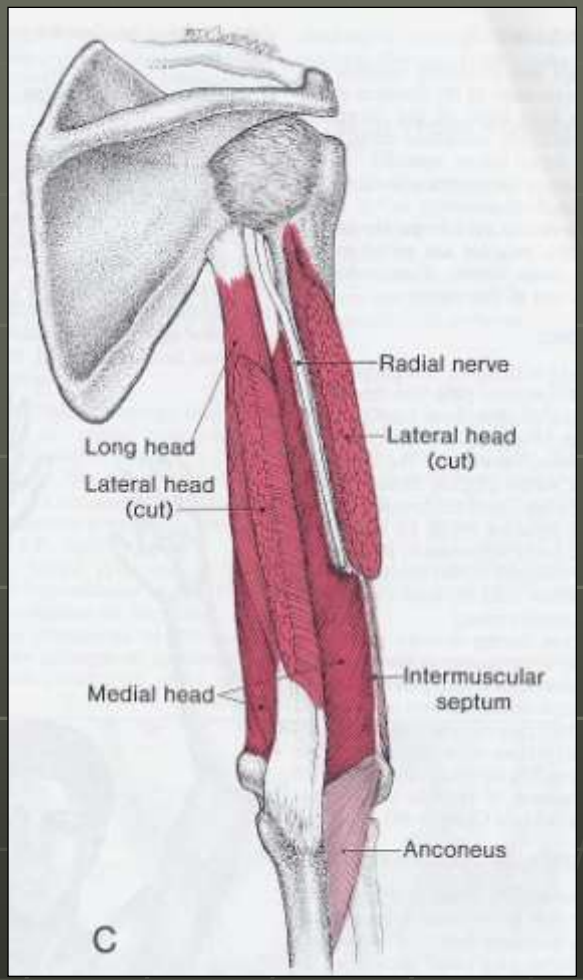
(Reid 1993)

Muscular Anatomy

- Supinator C5-C6
- Brachioradialis C5-C6
- ECRL C6-C7
- ECRB C6-C7
- Extensor Digitorum Longus C6-C8
- Triceps C7-C8
- Anconeus C7-C8







(Travell and Simons 1983)

Neural Anatomy

- Radial Nerve-
  - Between lateral and medial Triceps heads
  - Divides prox to elbow
  - Under fascial connections of ECRB
  - Pierces supinator head and continues to supply extenor musculature


Peyto Lake, Jasper

Lateral Elbow Pain

- Terminology - Tennis Elbow Vs Lateral Epicondilytis Vs Lateral Epicondylalgia
- Approximately 3% of population
- Accounts for 5-7/1000 GP visits
- 45% of elite tennis players
- Age- 35-50 years
- Males=Females

Etiology

- Becomes evident with repetitive loaded tasks
  - Tennis
  - Golf
  - Baseball
- Presents also with repetetive unloaded tasks
  - Sweeping
  - Computer workers ie desk jokeys

Common Symptoms

- Pain over lateral epicondyle radiating into forarm
- Pain on activities using the hands
- Weakness of grip strength
- Occasional night pain
- Possible soreness in the am
- May worsen thru the day

Sources contributing to Lateral Epicondylalgia

1. Common Extensor Tendon
2. Myofascial
3. Radio-humeral joint
4. Cervical and Neural Involvement
5. Central Sensitization
6. Elbow joint arthritis
7. Ligamentous

Common Extensor Tendon

- Tendinitis vs tendinopathy
- No findings of inflammatory cells
- Macroscopically-
  - Tendon is dull, brown and soft
- Microscopically-
  - Findings of disrupted collagen fibers
  - Increased cellularity-myofibroblasts but not inflam. cells
  - Neovascularization
  - Poorly organized collagen
  - Focal necrosis

Nirschl and Ashman 2003

Histology

Normal Tendon

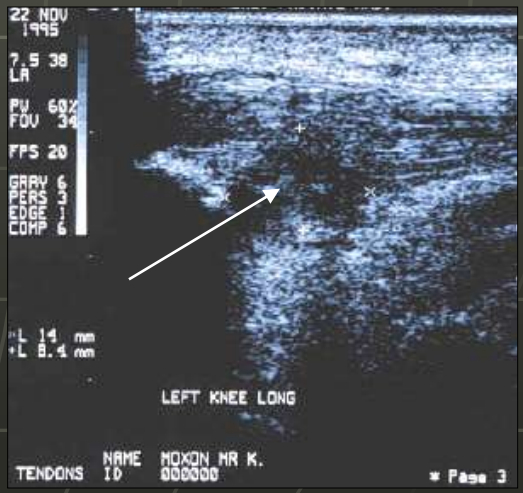
Tendinosis

Khan et al 2000

Imaging

- MRI
  - Increases in signal in affected tendons

- Ultrasound
  - Increase in hypo-echoic area in tendon



Khan and Cook 2004

Importance??

- Effect of medical anti-inflammatory treatments
  - NSAIDS
  - Cortisone injections
- Effect of physical anti-inflammatory treatments
- Outcome of injury
  - Time frames for rehabilitation
  - 3-6 months

Myofascial

- Travell and Simons
- Active trigger points through elbow musculature as causes of pain

Trigger points

- What are they?
  - Palpable tight and tender bands within muscle substance
  - Are normally found in muscle
  - When excessive can cause pain with referral
- Why are they??
  - Ca channel blockages
  - Tetonic muscular contraction
  - Avascular portion of muscle

Why they develop?

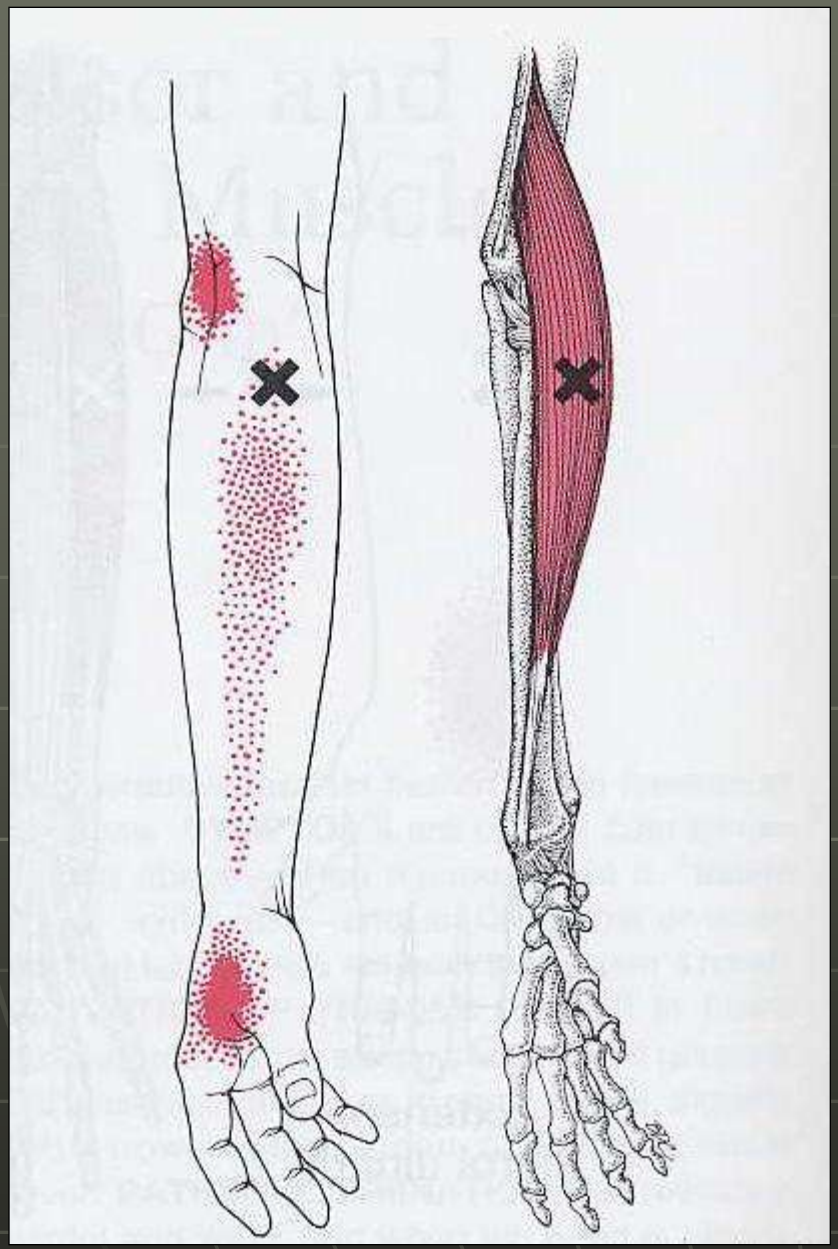
- Overuse
  - Repetitive action ie postural
  - Due to lack of local/deep muscle activity
- Protective response
  - neural system
- Neural driven
  - Radiculopathies
- Psychological
- Nutrition
- Sleep disturbances

Evaluation

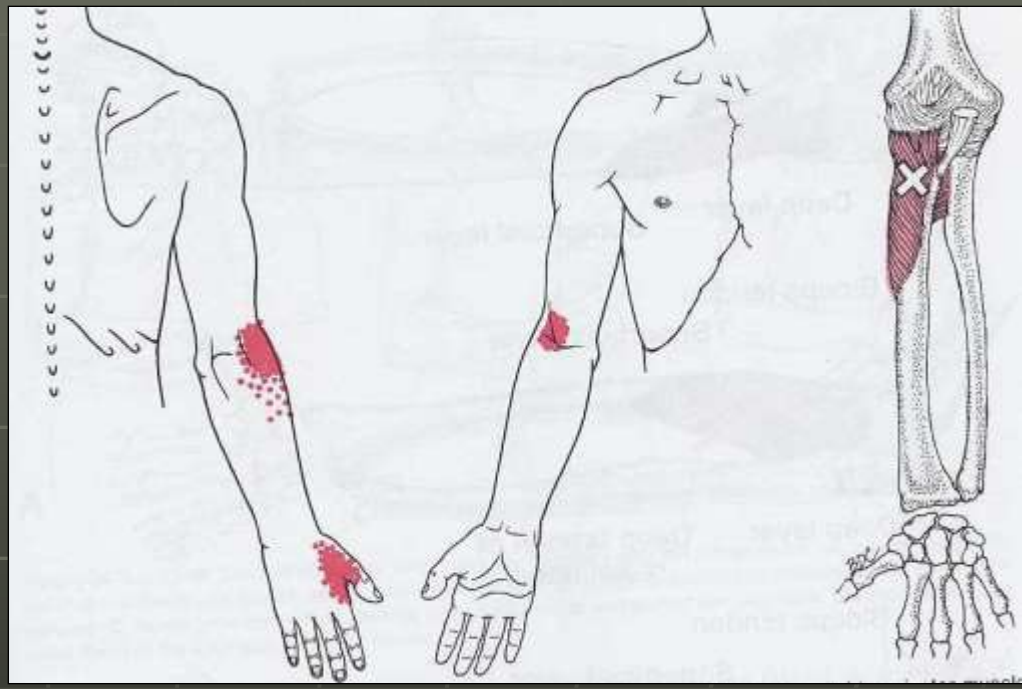
- Palpation of active trigger points through elbow musculature
- Palpate for active triggers through cervical and scapular musculature

Common trigger points involved in Lateral Epicondylalgia

- Brachioradialis
- Supinator
- Extensor Digitorum Longus
- ECRL
- ECRB
- Triceps
- Anconeus

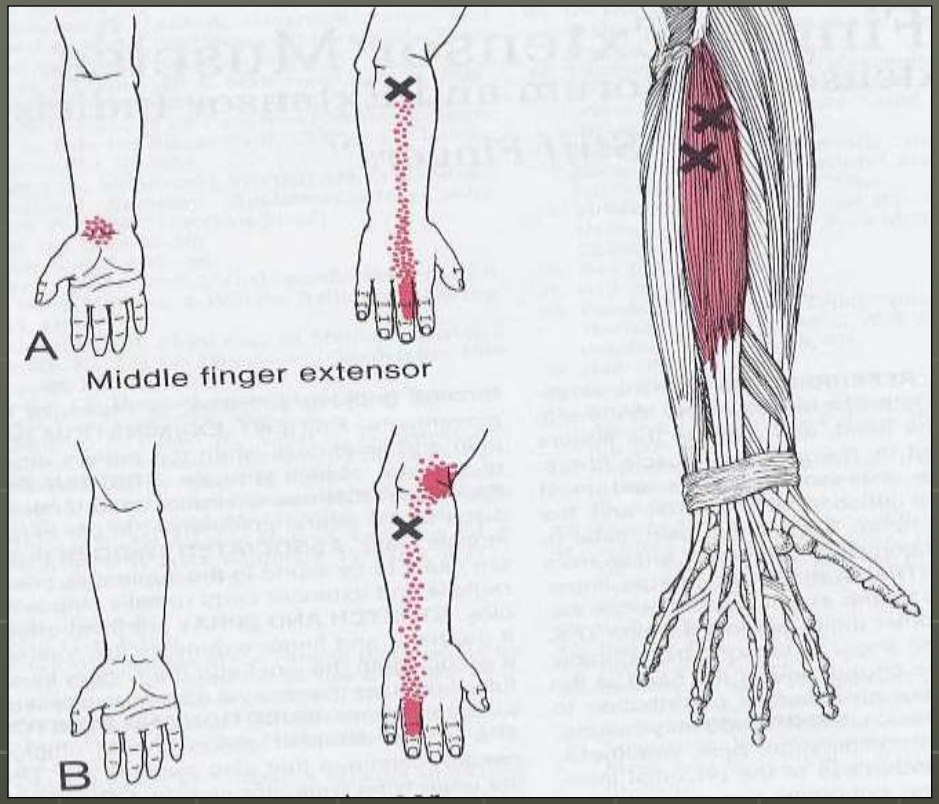


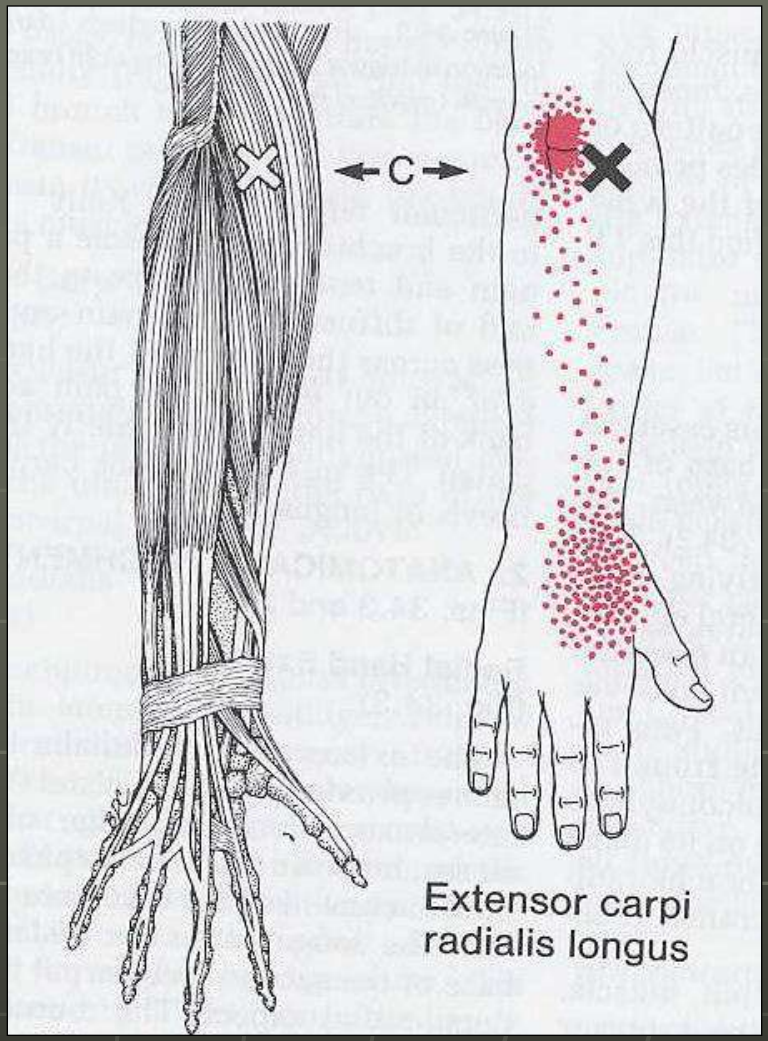
Brachioradialis

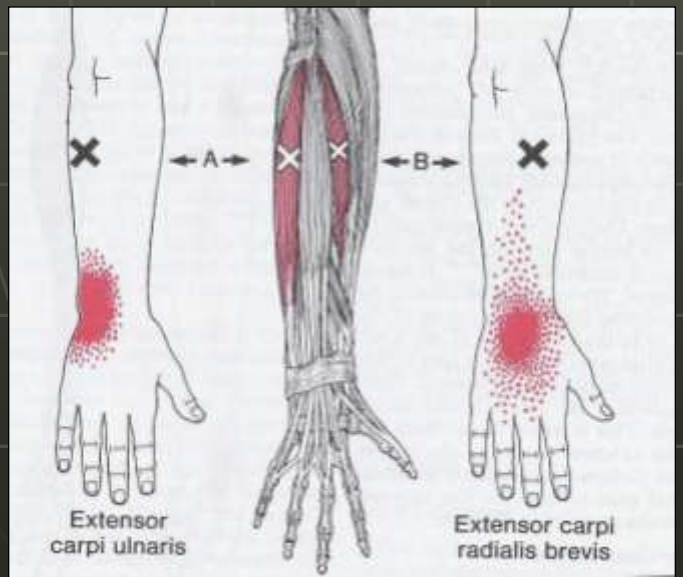


Supinator

(Travell and Simons 1983)



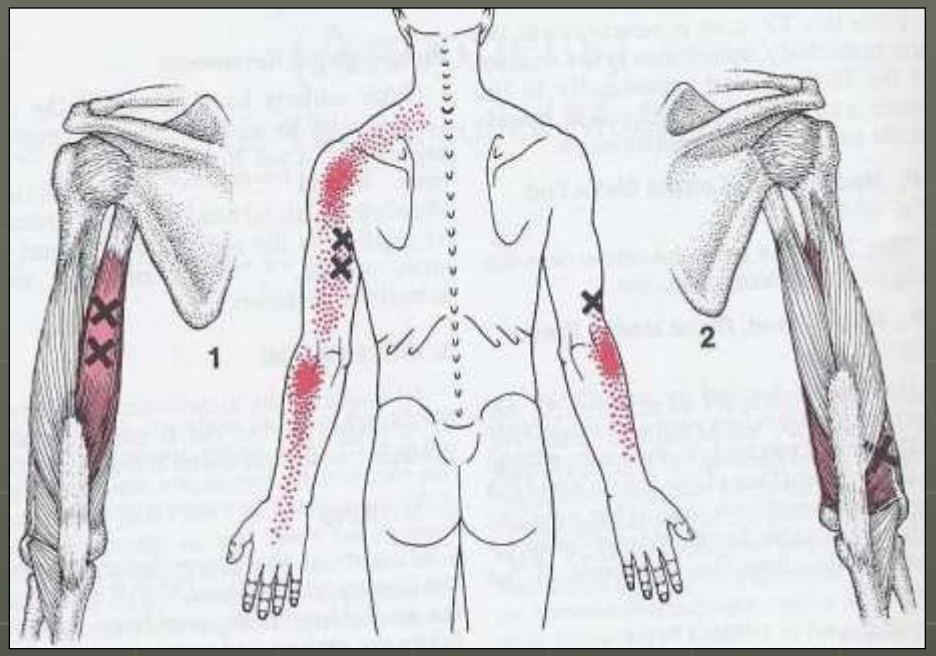




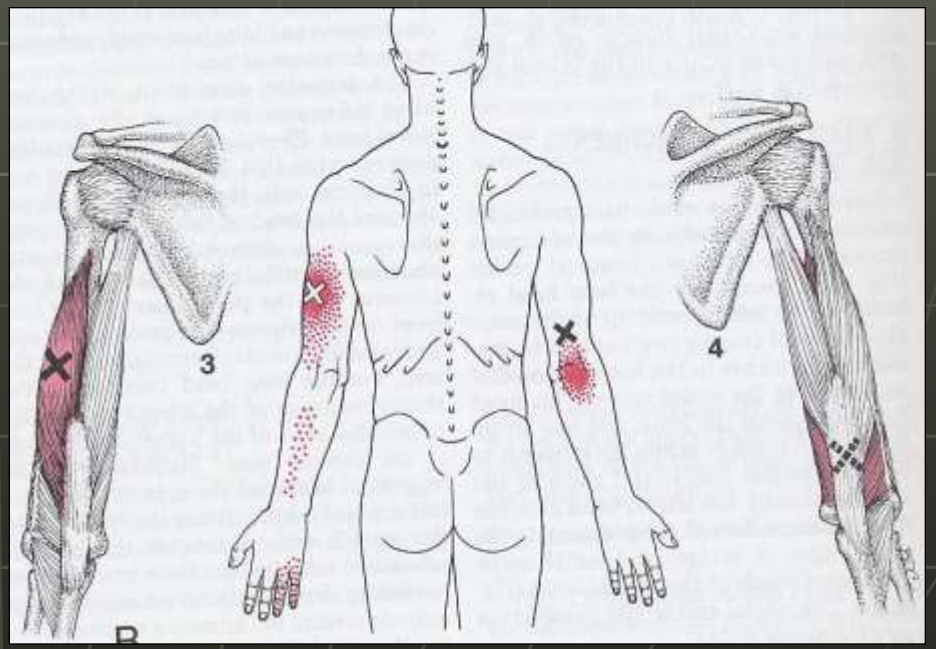
Forearm Extensors

(Travell and Simons 1983)

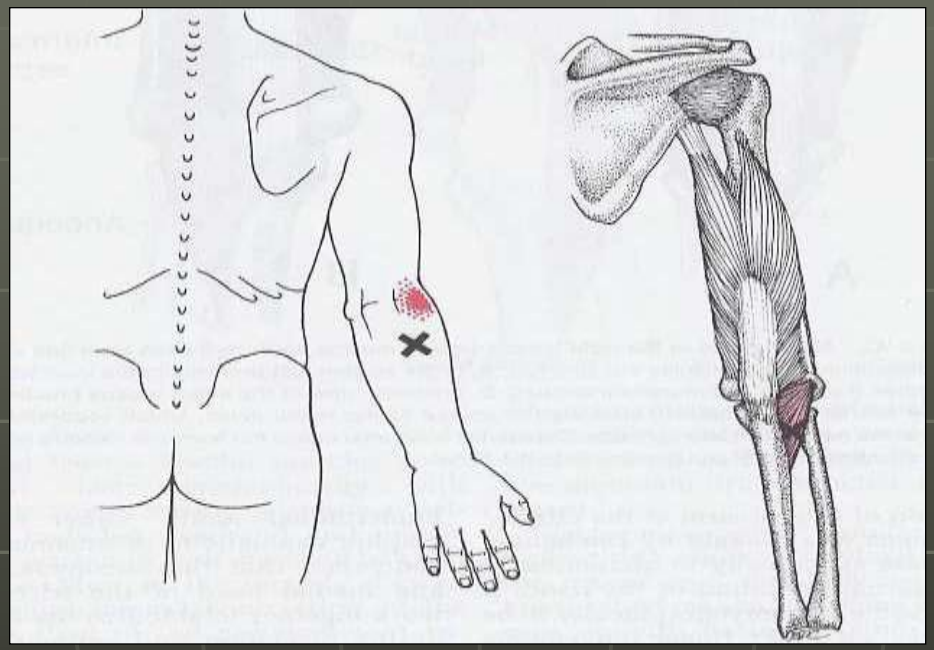
Triceps
Long head(1) and lateral Medial Head(2)



Triceps
Lateral Head(3) and Deep Medial Head(4)



(Travell and Simons 1983)



Anconeus

(Travell and Simons 1983)

Radio-humeral joint

- Radial head
  - "subluxes" in pronation
  - "reduces" in supination
- In sustained pronation postures, head of radius may sublux increasing load on CEO

  (Mack ??)
- Due to:
  - Lack of supination range
  - Poor eccentric control of supinator

Evaluate

- Joint play
  - Especially into supination
    - Lateral Glide
    - Accessory movement (Vincenzino 2003)
  - Only 20% of patients may have articular signs (Yaxley and Jull, 1993)
- Muscular control of supinator
  - Deep stabiliser of radiohumeral joint (Stroyan and Wilk 1993)

Neural and Cervical Involvement

- Most commonly C6-C7 spinal segments
- Upper limb neurodynamics altered
  - ULTT IIb-radial nerve

Evaluate

- Cervical Spine
  - PPIVMS- hyper vs hypo
  - PAIVMS
  - Possible direct referral to elbow
- Neural
  - ANT for radial nerve- ULTT IIb
  - Reactivity and tenderness on radial nerve palpation

Central Sensitization

- Secondary hyperalgesia
  - Represents disordered neural processing and central sensitisation
    - (Wright et al 1992)
- Examination of CEO-
  - Increased levels of glutamate, mediator in pain
  - Reduced levels of prostaglandin P2
    - (Alfredson, 2000)

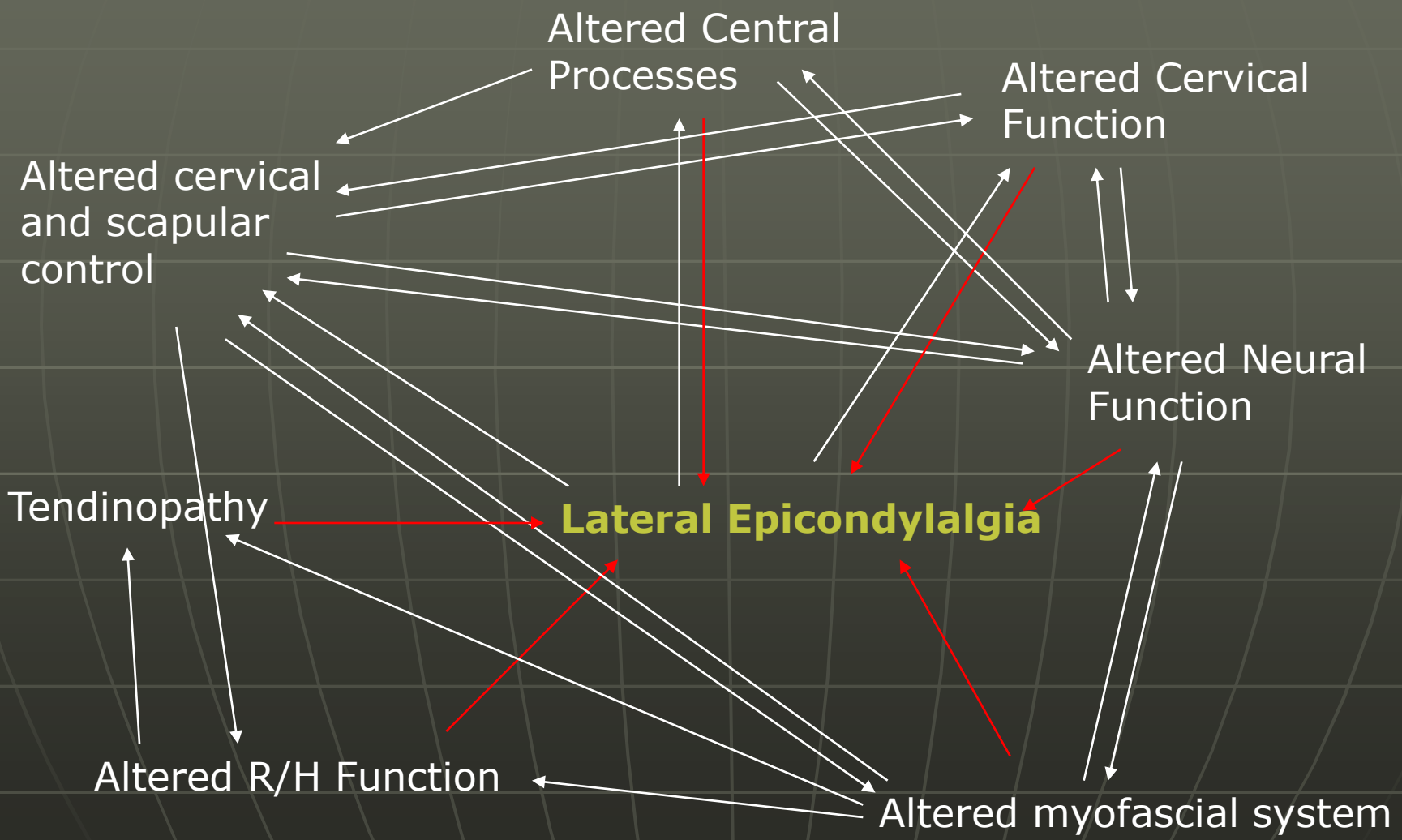
- Changes in sensory-motor system
  - Reduction in reaction time, speed of movement and co-ordination
  - Changes also evident in unaffected side
    - (Pienimaki 1997a)
- Abnormal postures and muscle activation
  - Studied in tennis players (Kelly 1994)
  - Clinically seen as poor scapulohumeral stability and poor postural positions

Evaluation

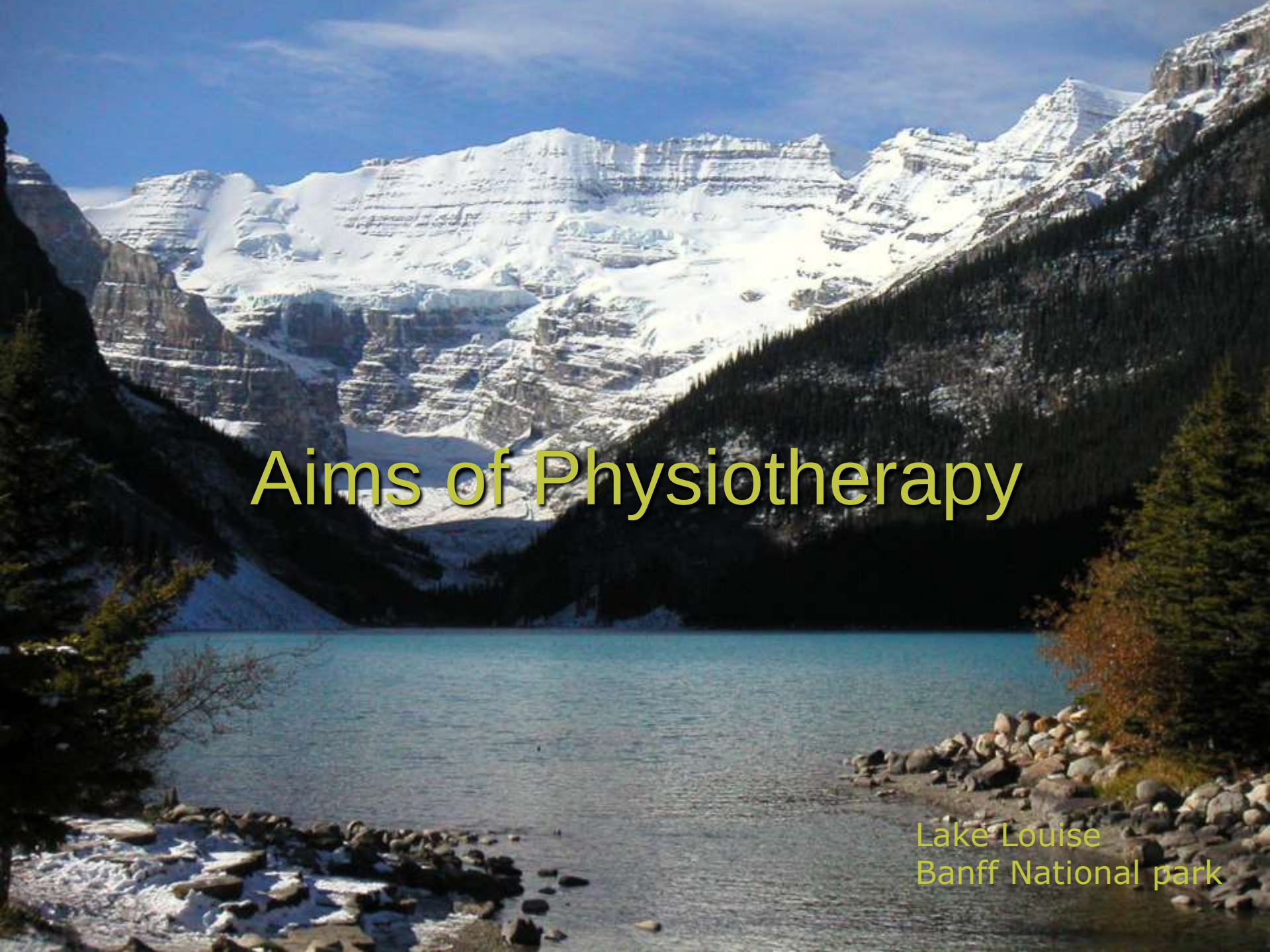
- Postural position
- Scapulohumeral stabilty and rhythm
  - Statically
    - Resting posture
  - Dynamically
    - Open kinetic movement
    - Close kinetic loading tests
    - Functional
    - Scapular slide tests


Putting it all together
Jasper National Park

How does it come together..



Aims of Physiotherapy



- Identify causative systems
- Use manual treatment techniques
- Therapeutic Exercise
- Progress above into functional tasks

Physiotherapy and Lateral Epicondylalgia

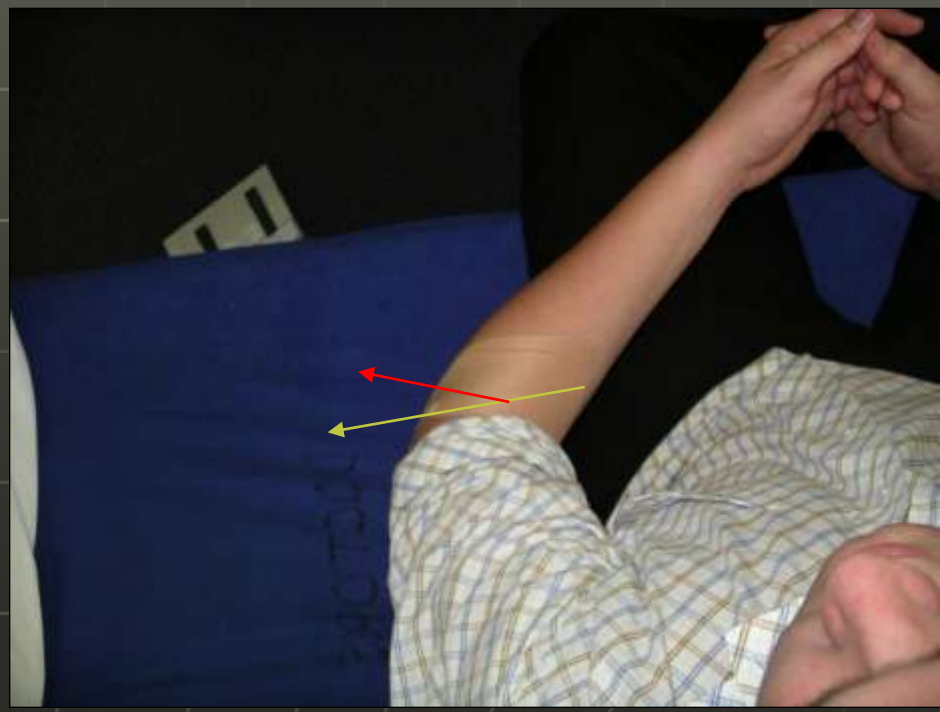
Jasper National Park

Treatment for Tendinosis

- Not a lot of supporting evidence for physical therapy modalities
  - Ultrasound
  - IFT
  - ICE
  - Frictions
- Best physiotherapy intervention
  - Eccentric wrist extensors exercise
  - Curwin and Standish type protocol
- Braces and taping
  - Unload forces in tendon

Tapings

UNLOADING and
RADIAL HEAD SUPPORT



MCCONNELL UNLOADING TAPE

Treatment for altered Myofascial System

- Release active trigger points
  - Soft tissue techniques
  - Spray and stretch
  - Ice release
  - Stretching
  - Trigger point injections
  - IMS- similar to dry needling, most effective
- Correct causative factors

Travell and Simons, 1983

Dry needling

- Most effective and least painful
  - ECRL
  - Brachioradialis
  - Supinator
  - Lateral head of triceps
- Painful
  - Anconeus
  - Extensor digitorum

Treatment for altered radio-humeral function

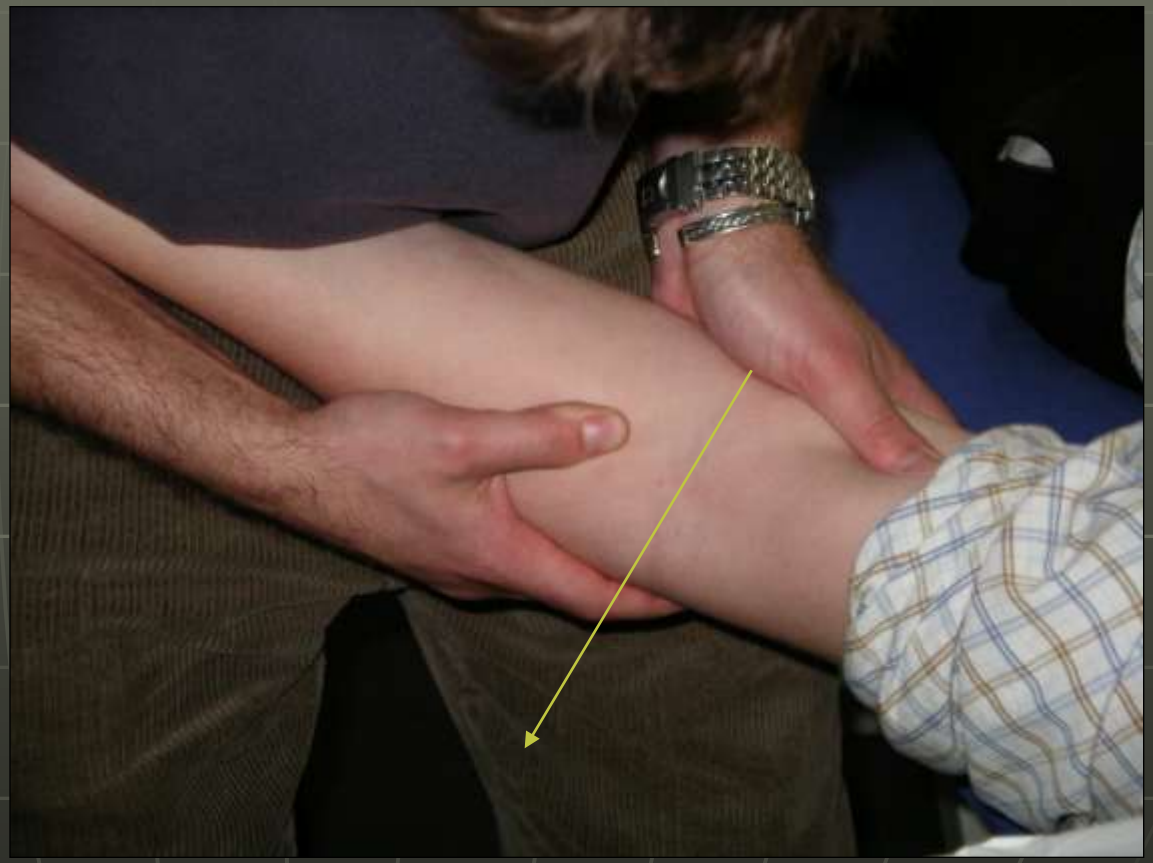
- Manipulation
- Radio-humeral joint mobilisations
  - p/a to improve supination
- MWM lateral glide of elbow
  - Manual treatment
  - Home treatment

(Mulligan 1999)

- Therapeutic Exercise
  - Eccentric Supinator control
    - Hammer
    - Theraband
  - Into ranges of elbow flexion
  - Progress to functional

Manipulation

- High velocity thrust
- Force in line with joint
- No muscle spasm



MWM elbow

- Sustained lateral glide
- Gripping
- Progress into elbow ext and pronation
- Pain free

MWM self treatment

Altered cervical and neural function and central processing

- Cervical manual therapy
  - Mobilisation
  - Manipulation
- Spinal/Neural manual therapy
  - Elvey approach
    - Lateral glides +/- neural tension (Elvey 1986)
  - Mulligan approach
    - MWM cervical spine- lateral glide or A/P

Elvey lateral glide

- Lateral glide to segment
- Oscillatory technique
- Progress into ANT

MWM with a/p glide

- Sustained a/p glide
- Gripping
- Progress into elbow ext pronation and ANT
- Pain free

- Effects may be more neurological than physiological
- Pathology Education- explain pain Butler
  - (Vicenzino 2003, Abbott 2001)

I FEEL GREAT!!


A guide for the use of
Manual Therapy (Vicenzino 2003)
Sunshine Village, Banff

1. Grip pain >> Palpation
   - MWM elbow and self treatment
   - Elbow manipulation
   - p/a radial mobilisations

2. Palpation>> Grip pain
   - Cervical lateral glide
   - MWM cervical spine- lateral and a/p

3. Grip pain=Palpation
   - Try 1 first…
   - May need to move then to 2

4. Past history of Cx dysfunction
   - Try 2

5. Night pain
   - As long as it is mechanical, use taping


A Guide to Therapeutic Exercise
Winter, Lake Louise

- Eccentric Exercise
  - Wrist extensors
  - Supinator
- Scapular Stability
  - Low traps
  - Serratus Anterior
  - Upper Traps??
- Cervical Stability
  - Deep neck Flexors

- Global Upper limb conditioning
  - Rotator cuff
  - Triceps
- Isolated and Functionally

Neuromuscular Connection

↓

Stability

↓

Dynamic

↓

Functional

(O'Sullivan 2000)

Practical Session

- MWM
  - Elbow lateral glide
  - Cervical a/p
- Elvey Lateral Glide
- Taping
  - Tennis elbow taping
  - McConnell Unloading

Three Sisters, Canmore