Physiotherapy Management Of Muscle Patterning Instability

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What is muscle Patterning?

- Innappropriate activation, commonly of the torque producing muscles of the shoulder.
- Lattissimus Dorsi
- Pec Major
- Deltoid

- Disruption of normal compressive forces
- Creates a destabilising shear force across the joint
- Uncontrolled translation – subluxation/dislocation

(Gibson & Elphinstone 2005)
Clues to confirm muscle patterning

- Look – Postural alignment/antalgic positioning/weight bearing/bony contours

- Feel – Muscle tone/resting position humeral head

- Move – Quality/Reluctance/Control/Fear/Muscle balance/Timing/Scapula dyskinesis/palpatate translation hh with elbow flex/ext or ghj ER.

- Balance – single leg stance eyes open/closed

- Beighton Index

- Proprioception – jps/match positions/target
Balance & Proprioception

Screening tests of balance control and integration of the kinetic chain

- Single leg stance – eyes open/closed
- Overuse of righting reactions – Significant loss of balance with eyes shut
- Single leg squat
- Poor rotational control of the lower limb
- Ability to maintain segmental alignment in the trunk
- Tendency to fix the shoulder complex with the patterning muscle
- Injury
- Disruption to mechanoreceptors
- Partial deafferentation of glenohumeral joint
- Inhibition of normal neuromuscular/joint stabilisation/feedback loops to rotator cuff
- Altered muscle sequencing
- Increase in instability

(Reimann & Lephart 2002)

Mechanism – injury to altered muscle sequencing
Strengthening

- Increases the strength of all muscles thus increasing/maintaining discrepancies.

- Retraining addresses muscle dominance/recruitment
Rehabilitation Tools

- Reassurance
- Reassurance
- Reassurance
Education

- Determine patients understanding their expectations
- Shoulder models/pictures/
- Role of physiotherapy
- Positive approach/realistic
- Develop common goals
- Liaise with parents/teachers/carers
Rehabilitation

- Reassurance
- Inhibit overactivity in patterning muscle (Latts/Pecs/Deltoid)
- Develop control of humeral head translation
- Assist integration of sensory & motor systems
- Restoration of Normal Movement Patterns
Inhibition of Patterning Muscle

- Palpation
- EMG
- Biofeedback – Mirrors/Taping/Support
- Heat
- Contract/Relax
- Rotator Cuff recruitment through range of motion
- Sequencing patterns
- Gymball – weight transfers/dissociation activities
Glenohumeral Joint Neutral
(Magarey & Jones 2003)
Scapular Assistance Test

- Assist the scapular retract and upwardly rotate as the arm is elevated
- +ve pain diminished +/or increased ROM
- Indicates improving scapular motion may reduce symptoms
  - Kibler & McMullen
  JAAOS 2003
Scapular assistance test

Patient will often pull down against therapist’s hand during examination of mobilization.
Posture

• Tendency to weight bear away from problem shoulder

• Difficulty with lateral weight transfer under the affected shoulder without trunk shortening

• Unable to dissociate the pelvis from thorax

• May observe side flexion or protraction of the SG

• Gait – reduced arm swing
Kinetic Chain
Posterior Oblique Sling

- Lattissimus dorsi
- Thoracolumbar fascia
- Glut max

- Inhibition in gluts, increase activity in latts – hh pulled postero-inferiorly, eccentric overload on glenoid.
- Utilise this in reverse to restore normal movement patterns

Bullock & Saxton (1994), Myers TW (2001)
Patient may side flex trunk or attempt to adduct the arm in response to resistance.
Facilitating Movement
Movement Patterns

Flexion dominant pattern – s.ant is inhibited, pecs/rectus fix trunk– poor dissociation of Thorax & pelvis, limits trunk segmental extension

Creates anterior inferior translation shear in the glenohumeral joint.
Weight Transfers
Balance Monitor
Gym ball
Combining facilitation & kinetic chain
Sensorimotor System

- Proprioception –
  - joint position sense (space)
  - kinaesthesia (Joint motion), and
  - Sensation of resistance (force generated within a joint)
- Neuromuscular control

(Myers, et al 2006)
Proprioception
Flexi bar
Co-ordination & endurance
Rhythmic stabilisations & vibration plate
Developing control in combined positions
Specifics
Developmental sequencing
Angels
Laterality Testing
Summary

- Classification system
- Do not look at the shoulder in isolation
- Core stability
- Ensure correct movement pattern prior to strengthening
- Restore dynamic stability
- Return to function
Thanks for listening

Any Questions?