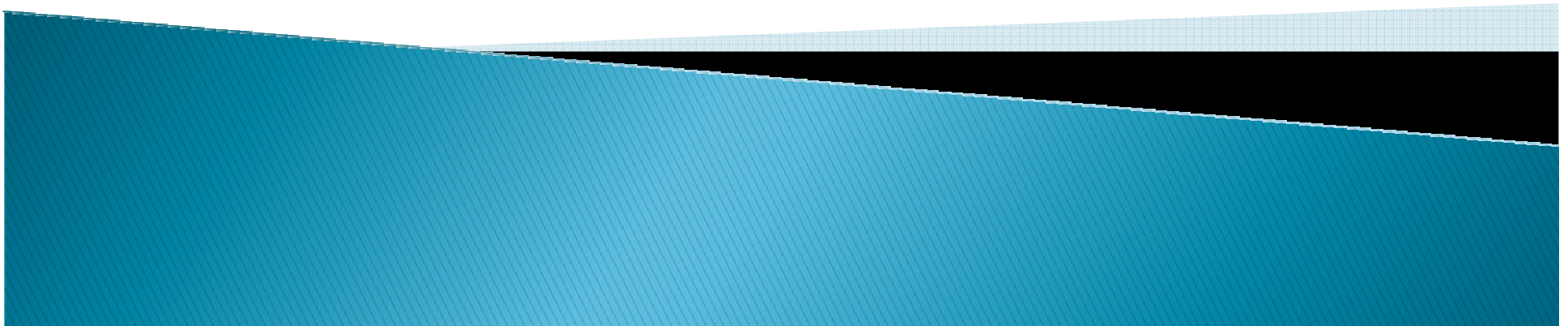
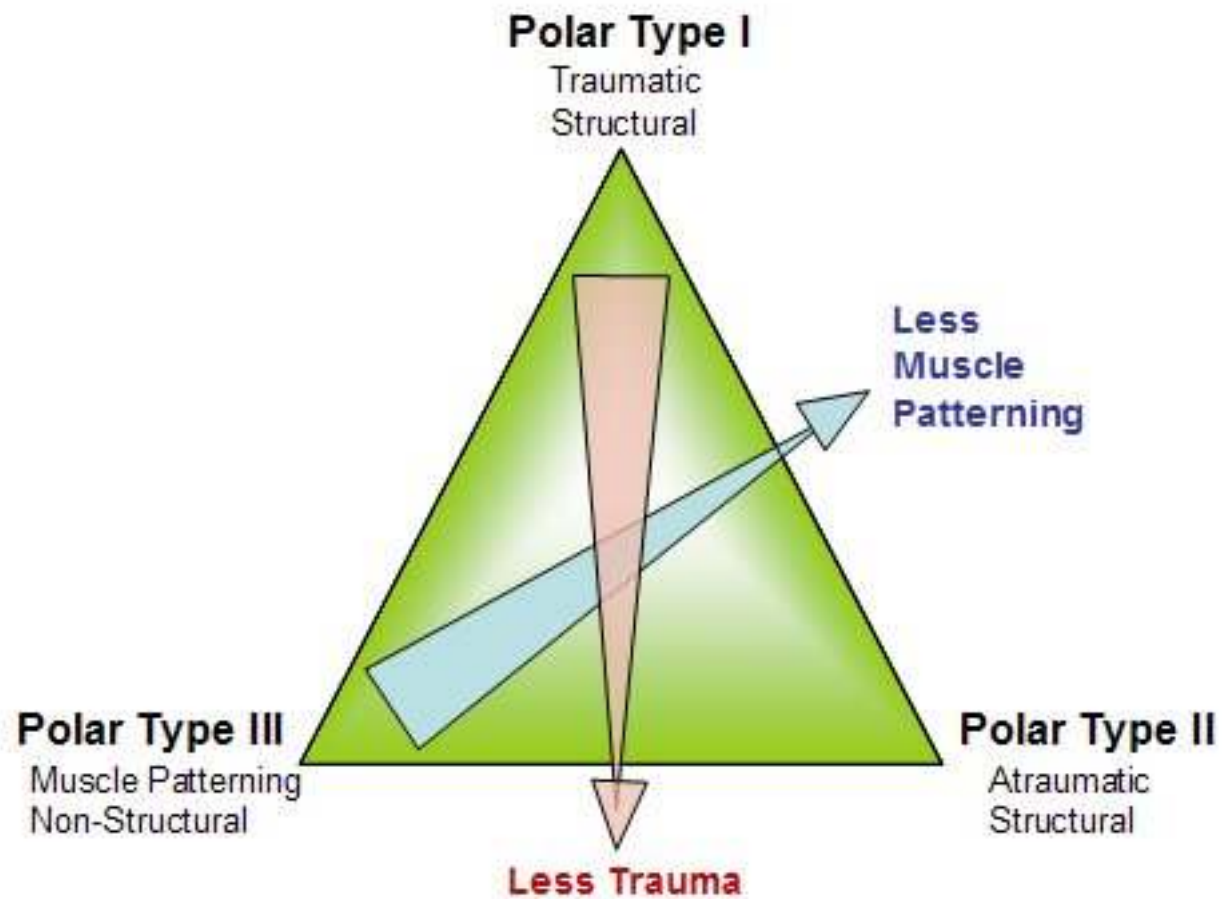


Physiotherapy Management Of Muscle Patterning Instability

Lorna Goodchild
2010

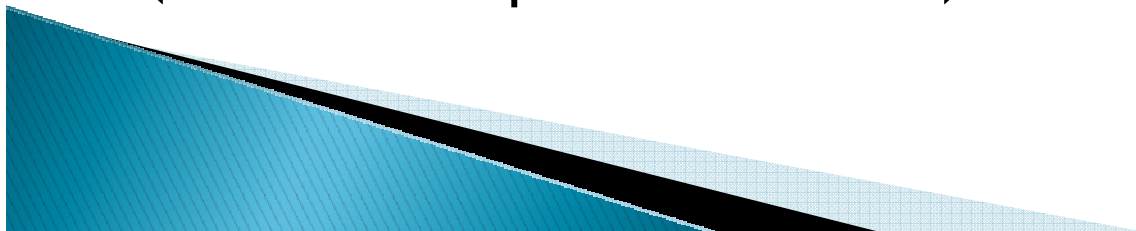




What is muscle Patterning?

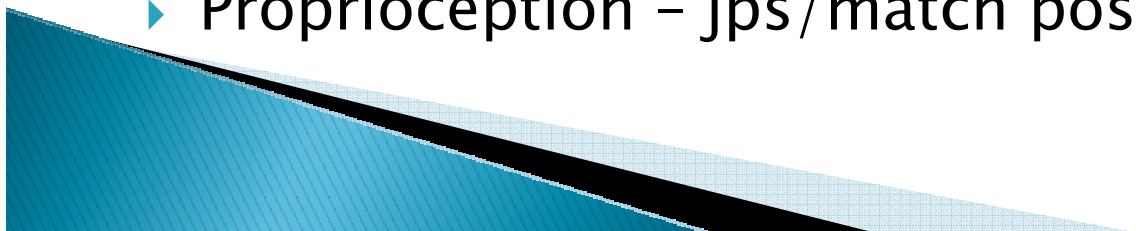
- ▶ Innappropriate activation, commonly of the torque producing muscles of the shoulder.
- ▶ Lattissimus Dorsi
- ▶ Pec Major
- ▶ Deltoid
- ▶ Disruption of normal compressive forces
- ▶ Creates a destabilising shear force across the joint
- ▶ Uncontrolled translation – subluxation/dislocation

(Gibson & Elphinston 2005)



Clues to confirm muscle patterning

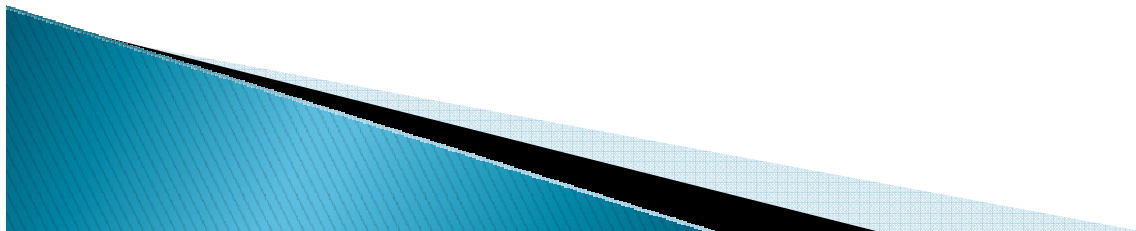
- ▶ Look – Postural alignment/antalgic positioning/weight bearing/bony contours
- ▶ Feel – Muscle tone/resting position humeral head
- ▶ Move – Quality/Reluctance/Control/Fear/Muscle balance/Timing /Scapula dyskinesis/palpate translation hh with elbow flex/ext or ghj ER.
- ▶ Balance – single leg stance 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



Causes



- ▶ 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

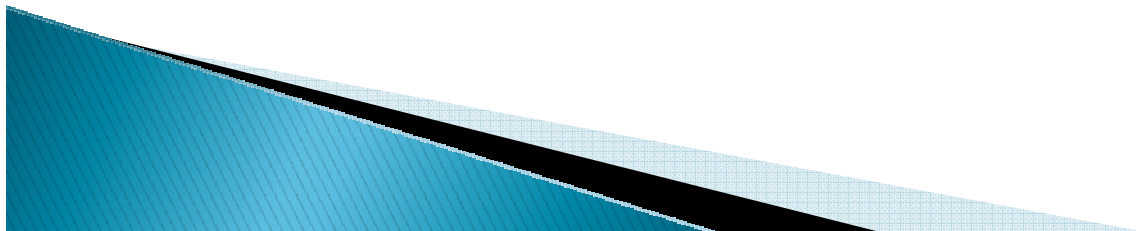
(Reimann & Lephart 2002)

Mechanism –injury to altered muscle sequencing



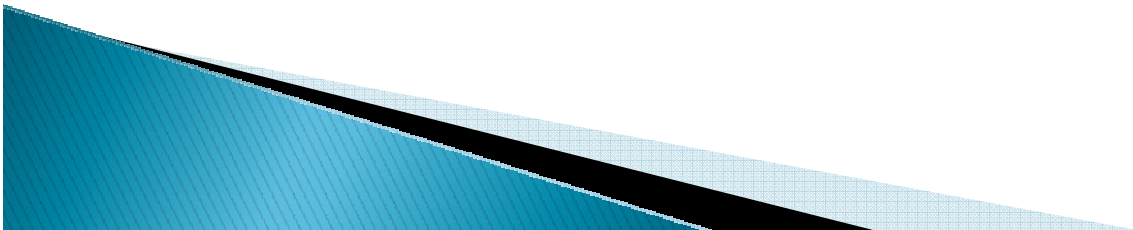
Strengthening

- ▶ Increases the strength of all muscles thus increasing/maintaining discrepancies.
- ▶ Retraining addresses muscle dominance/recruitment



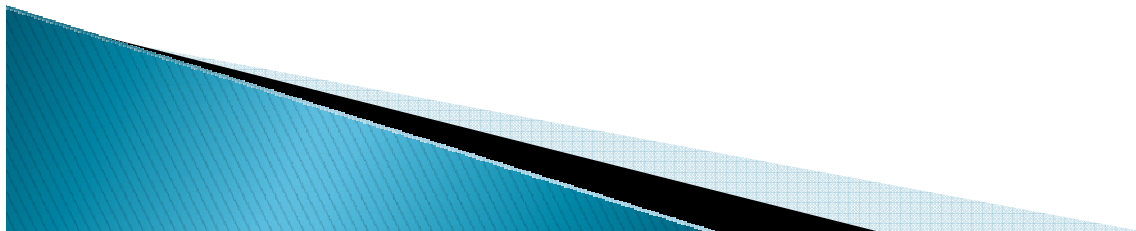
Rehabilitation Tools

- ▶ Reassurance
- ▶ Reassurance
- ▶ Reassurance



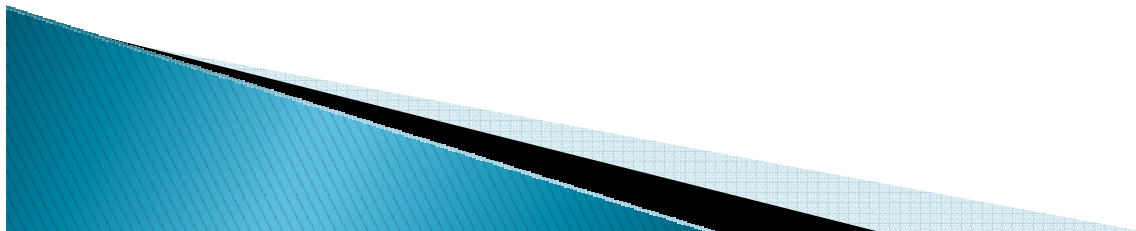
Education

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



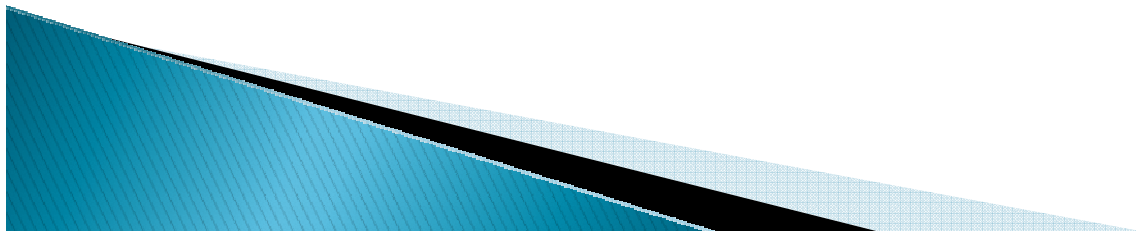
Rehabilitation

- ▶ 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 +/- increased ROM
- ▶ Indicates improving scapular motion may reduce symptoms

– Kibler & McMullen
JAAOS 2003

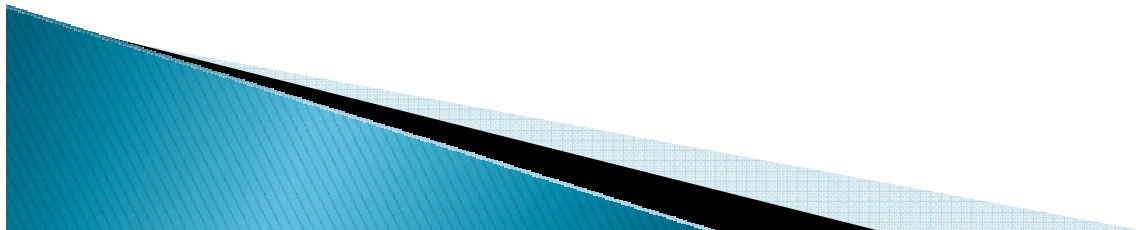


Scapular assistance test

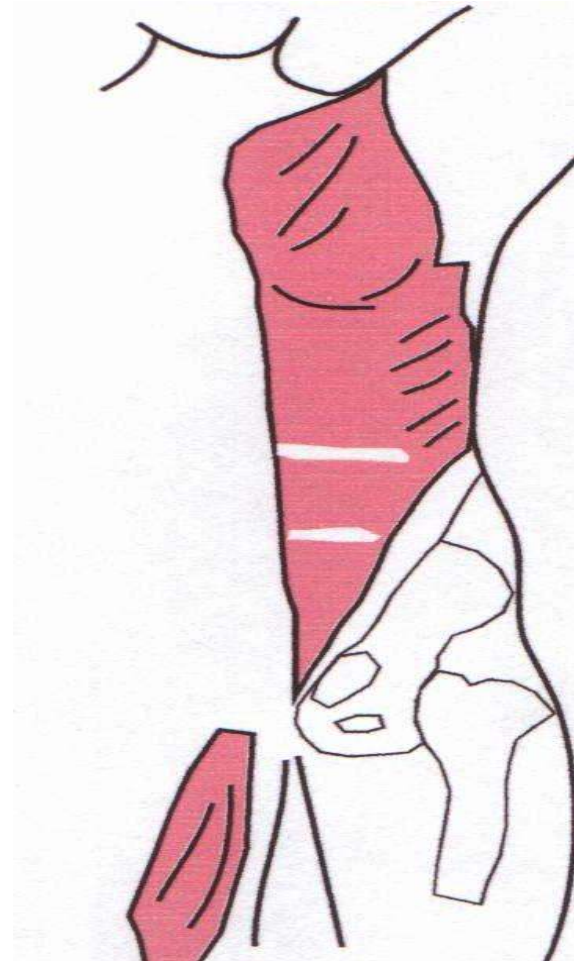
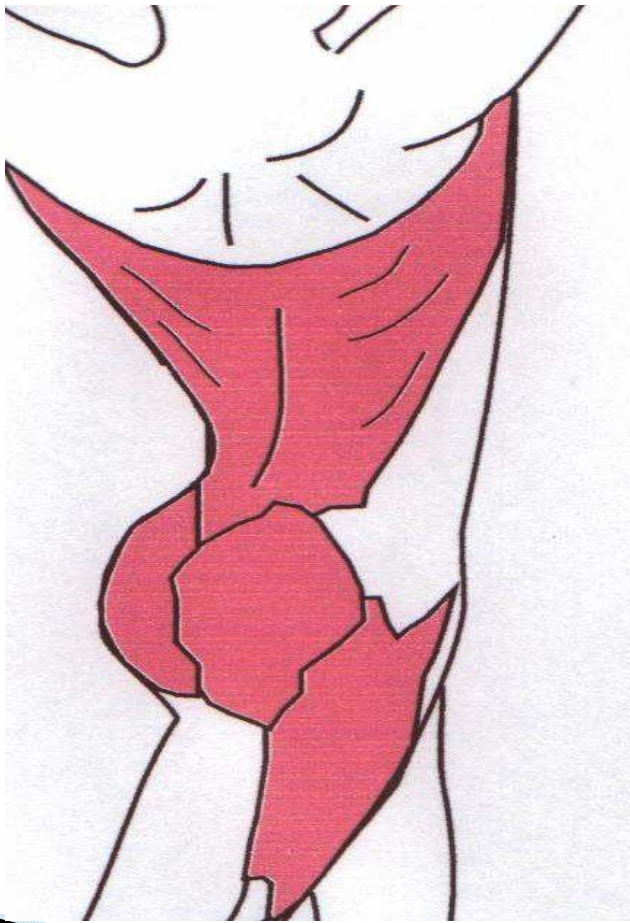


Posture

- 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

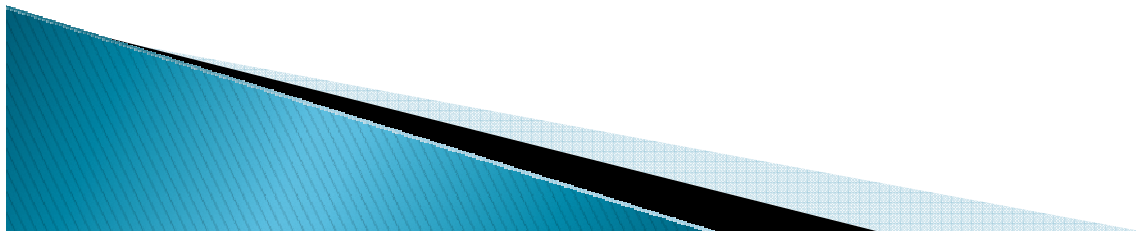


Posterior Oblique Sling

- ▶ 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)





Resisted ER >>

Patient may side flex trunk or attempt to adduct the arm in response to resistance.

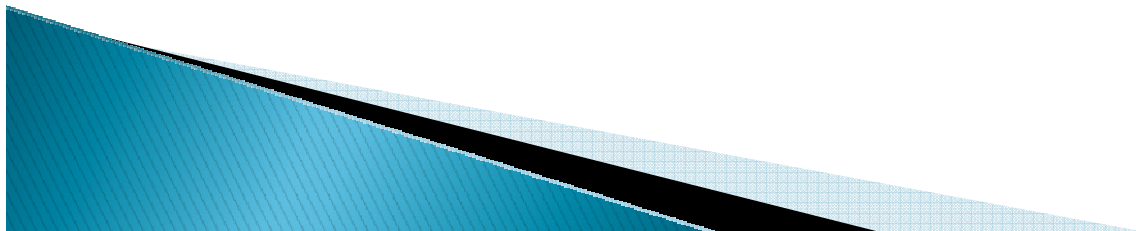
Facilitating Movement



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

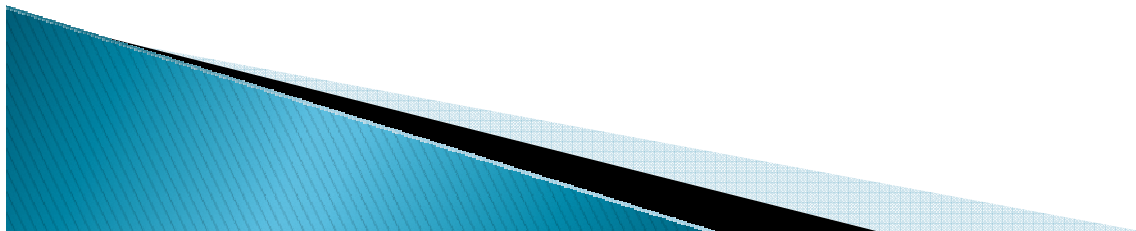


Combining facilitation & kinetic chain



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

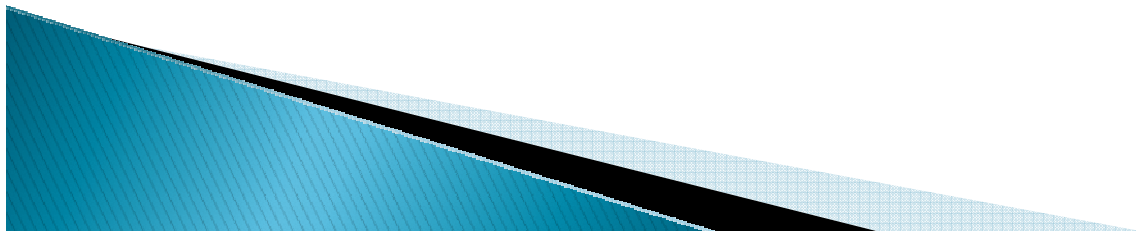


Laterality Testing



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?

