Rehabilitation of the Cervical Spine

Cervical Spine Motor Control
- Those suffering with neck pain often display altered motor recruitment patterns at the cervical spine
- Over active superficial flexors and extensors inhibit deeper musculature
- Without stabilisation from the deep musculature faulty movement patterns occur, causing buckling stress through the spine and high work-loads of the superficial muscles
- Exercise protocols to retrain the motor control deficits of the cervical spine have shown significant improvements in those with neck pain, cervicogenic headaches and whiplash associated disorders.
- The muscles targeted as those that control cranio-cervical flexion and scapular stabilisation.

Cervical Flexion Test
- This is a quick screen to check for any muscular imbalance
- Poking forward of the chin would indicate poor motor control of the deep cervical flexors
- Shaking of the head would indicate reduced endurance of the cervical flexors (deep and superficial)

Cranio-cervical Flexion
- Gently and slowly nod the head as if saying “yes”. Hold for 5 seconds. Do NOT retract the cervical spine.
- Can be done in sitting
- Can be held for longer as a progression
- Can be broken into increments of nodding
- Can be held during cervical flexion and head being lifting off the bed- this can also be done eccentrically

Scapular Positioning- Lower Trapezius
- In prone position, palms facing the ceiling
- Pull shoulder blades back and down. Maintain scapular position and raise hands off bed
- Progression- palms facing the bed
- 90 degrees shoulder abduction
- 90 degrees shoulder abduction plus external rotation
- Plus Cranio cervical flexion AND cervical retraction
- 120 degrees abduction so humerus is in line with fibres of lower trapezius
**Scapular Positioning - Serratus Anterior**

- **Supine pushes** - With the client supine encourage shoulder protraction with the arm at 90 degrees of flexion. This will help the client understand the movement of the shoulder blade that is required.
- **Wall slides** - Forearms on a pillow against a wall. Protract and activate serratus anterior to prevent scapula winging. Ensure there is minimal upper trapezius activation. Maintaining a good scapulohumeral rhythm, with correct scapula upward rotation, slide the arms up the wall.
- **Push up plus** - Push ups with serratus anterior protraction at the end

(Ask et al., 2009; Falla et al., 2007; Jull et al., 2004; Jull et al., 2002; Jull, 2000; Jull et al., 2009)

**Cervical Spine Strength and Endurance**

- Due to faulty movement patterns the superficial flexor and extensors often show poor strength and endurance.
- Exercise programmes to retrain the strength and endurance of the superficial flexor and extensors and axialscapular musculature has also been shown to give benefits in those with neck complaints.

**Upper Trapezius**

- In 4 point kneeling maintain a neutral cervical spine with craniocervical flexion. Hold this position for 5-10 seconds. This encourages eccentric control of the upper trapezius.

(Ask et al., 2009; Ylinen et al., 2010; Ylinen et al., 2003)

**Shoulder Girdle Stability/Motor Control and Shoulder Strength**

- Many programmes have also incorporated exercises to regain shoulder girdle stability and shoulder strength.
- Authors have theorized that if the shoulder girdle is unstable cervical musculature will contract to act as prime movers for the cervical spine and stabilise the shoulder girdle.
- This again will lead to faulty movement patterns, mechanics and joint buckling with the majority of the superficial muscles being over worked.
- Scapular motor exercises should be used to encourage scapular upward rotation, external rotation and posterior tipping.

(Andersen et al., 2011; Cook, 2010; Sahrmann, 2010; Ylinen et al., 2007; Ylinen et al., 2003)

**Kinesthetic Sense, Proprioception and Hand Eye Co-ordination**

- Exercise programmes directed at retraining proprioception and hand eye co-ordination have demonstrated improvements in those with whiplash associated disorders.
- The mechanism of this is not yet fully understood.

(Jull et al., 2007; Madeleine et al., 2011; Revel et al., 1994)


