## Rehabilitation Protocol

**Neurolysis of Long Thoracic Nerve for Scapular Winging**

### Phase 1

**Aims**
- Regain shoulder range of motion
- Restore normal scapulothoracic joint range
- Restore normal posture
- Restore normal breathing patterns

**Precautions**
- ROM exercises are gentle active or active assisted.
- Avoid strenuous activity
- No sling required
- Respect wound healing

**Treatment**
- Introduce postural awareness
- Deep breathing exercises
- Active range of shoulder motion if no scapular dyskinesis (Use active assisted if scapular dyskinesis present)
- Techniques can be used to restore normal flexibility of tissues/joints causing structural limitations (for example SC and ACJ mobilisation, release of subclavius etc. if necessary)
- Early kinetic stability exercises without resistance. Closed chain can be used in non-(arm)-weight bearing positions.

### Phase 2

**Aims**
- Regain and improve scapular muscular strength
- Scar tissue management and scar mobility
- Kinetic chain stability
- Maintain proper shoulder alignment

**Precaution**
- Guard against pathogenic activity

**Treatment**
- Active scapular stabilisation exercises
- Kinetic chain stability work
- Restore scar mobility
- If scar sensitive – desensitise program
- Progress shoulder program strength
- Proprioception and neuromuscular control
- Electrotherapeutic modalities: biofeedback electromyography or NMES can be introduced depending on therapist and patient choice

### Phase 3

**Aims**
- Increase strength power and endurance of scapular musculature and kinetic chain
- Gradually initiate sport activity

**Treatment**
- Proprioception and neuromuscular control drills
- Scapular muscle function
- Diagonal PNF patterns, with proximal stabilization
- Scapular retractors, posterior tilt, and upward rotation with resistance.
- Introduce upper limb weight bearing
- Introduction of weights to upper limb strength program if indicated

**Other**
- Sport specific or work simulated rehabilitation program