

Remedial/Rehabilitation - Spine

General advice

Do not work with any condition that you do not feel comfortable with - if in doubt, refer to a specialist and work under their guidance



- ❖ Work out susceptibility/what movement aggravates.
- ❖ Work away from pain and gradually into it.
- ❖ Observe movement patterns and articulation in the injured area ie spondylolisthesis – extension above the affected area is fine. With disc problems, no loading. Tests – core stability – to check multifidii, palpate L4 whilst walking or raising arm.
- ❖ Try to restore segmental movement of the spine at all levels. This restores equal distribution of forces throughout the spine.
- ❖ When rehabilitating your client, be aware that after injury, proprioceptive dysfunction sets in and will need to be changed.
- ❖ The intrinsic muscles around the injured joint tighten to protect. The VMO (Vastus Medialis) however will not contract if there is knee pain.
- ❖ Excess stiffness vs excessive movement – strengthen excessive movement first before mobilising the stiff area.
- ❖ Look at muscle length. If hyper mobile, strengthen. If tight, lengthen. Bad posture correct.
- ❖ Correct faulty movement patterns, habitual movements, and compensatory actions. Replace with correct movements.
- ❖ Age is a consideration. Older people's range of movement (ROM) is less.

Rule of Thumb: think do I need to stabilise, strengthen or mobilise?

Remember:

Start off with a low threshold and minimal movements. Stabilise and then gradually increase the setting (progression) ie strengthening deep neck flexors using this principle, one would start lying down supine to work these muscles, progressing to sitting with back against the wall and working these muscles so that one is working against gravity, and finally, using the cobra exercise to challenge.

Whiplash

- ❖ Sudden jolt from flexion to extension.
- ❖ Ask your client what position they were in when it happened. If it were a major trauma the damage would not show on a scan. It affects the facet joints.

- ❖ Symptoms - any of the following: inflammation, tingling, numbness, headaches (usually top of the head and over the eyes either uni or bi-laterally). Weakness, sensory loss and whiplash can cause nerve root damage, which in turn can cause peripheral damage.
- ❖ First step is to wait for the inflammation to go down and/or removal of neck collar. Once you have the ok from the doctor (physio), work core stability and the rest of the body. Stay away from flexion, head rolling, and neck exercises with resistance. Gradually progress to gentle neck exercises (which are usually prescribed by the physician). Objective is to gradually restore full ROM.

Laminectomy

When the arches of one or more vertebrae are removed exposing a portion of the spinal cord for removal of a tumour, relief of pressure due to a fracture or disc protrusion.

Discectomy

- ❖ Quarter of **discectomies** performed leave problems. The nerve is cut to multifidus, which is not good. To check this muscle, sit and dig fingers into the sides of the spine. Contract the pelvic floor and feel the multifidus contract. Or, palpate L4 whilst walking or raising arm. This is an important postural muscle.
- ❖ **Osteochondritis** - softening of the bone in adolescence. Sometimes pain but not always. Increased lumbar lordosis?
- ❖ **Sciatica** - pain down back of leg due to nerve root compression - ie herniated disc; weavers bottom (ischial bursitis); piriformis syndrome. When working with sciatica, and general back problems, keep the neutral zone to a reasonable amount.

Neutral Zone - the amount of play around a synovial joint. Muscle strain and degeneration increase the neutral zone. Increased movement in the facet joints leads to degeneration. Ankylosis spondylolithesis decreases the movement around the joint and therefore decreases the neutral zone.

- ❖ Hyper mobility - work for strength not stretch
- ❖ Hypertonic muscle - having excessive tone; hypotonic muscle - lacking normal tone.
- ❖ **Osteophyte** - in facet joints. Pain relief from anti-inflammatories and exercise. Nasty pathologies. Get referred pain. Symptoms: weakness and paralysis on motor nerve. Tingling, numbness of specific bands of dermatomes. Test by doing straight leg raises. In the acute phase, drugs, corset and gentle exercises (no stretching, concentrate on strengthening the multifidus, the nerve of which is segmentally enervated, the pelvic floor and core stabilisation), and taping by the physio to help off-load. Diagnosed by mini CT scans. There is a long-term weakness. Sitting for long periods should be avoided.

Herniated Disc

- ❖ Nucleos Pulposis (NP) squeezes through the outside of the disc (Annulus Fibrosis). Sometimes there are no symptoms. Inflammation is at the side and this is what causes the problems - usually in extension. (In adults in the mid-twenties range, the NP does not bulge out because there is not enough liquid. Causes: lifting and twisting.
- ❖ Wherever the protrusion is, the client will shift away and towards the pain.
- ❖ When acute no exercise, use pain relief and rest.
- ❖ Symptoms: hurts when coughing, deep breathing, might feel nauseous. Aggravated by sitting for a long time (flexion). Worse in the morning.
- ❖ Can show up on MRI scan.
- ❖ A big bulge is the disc narrowing.
- ❖ Pain is centralised and can lead from the site down the back of the leg.
- ❖ If there is numbness and tingling in the groin area and pain when on loo - 999!
- ❖ When acute, there is a decrease in leg movement and an increase in pain.
- ❖ Prolonged periods of standing can aggravate the problem and cause pain due to compression.
- ❖ Accidents like a chair being moved away on sitting, major traumas and road traffic accidents make the person more susceptible.
- ❖ Physio's job: get them moving, confidence. Mackenzie exercises good i.e back extension - cobra.
- ❖ Yoga teacher's job: most disc problems are not posterior therefore extension is good. Lateral flexion and twists should be avoided until trunk stabilisation is strong. To be on the safe side, avoid until given the go ahead by the physio and/or osteopath.

Scoliosis

- ❖ **Idiopathic scoliosis:** occurs during early teens. Females 5-1. Get a lot in the dance world. Gets worse until they stop growing.
- ❖ **Congenital scoliosis:** Homeo vertebra - one side of the vertebral body is narrower than the other.
- ❖ **Postural scoliosis:** causes uneven leg length and twisted pelvis. Sometimes there is a compensatory shift from the ensuing pain.
- ❖ Two types of curves: a 'C' and an 'S' curve.
- ❖ 3% of population have scoliosis
- ❖ **Structural scoliosis** - vertebra twists, ribs follow suit. Can be checked by getting the client to stand and then roll down slowly. If it's postural, there is no unevenness.
- ❖ Treatments vary. If severe, a leather brace with bars called a Milwaukee brace can be used. Another one is the Boston brace, which is moulded thick plastic brace.
- ❖ Remedial exercise: xtension exercises are good. Both passive and active. Core stabilisation work. Side bending stretches will facilitate rotation. The use of rotation discs and gymnastic balls are helpful. Whilst doing strengthening exercises, the brace should be kept on. Off whilst stretching.
- ❖ Avoid too much flexion as this could encourage excess curve. If used ie roll downs, do extension ex, flexion (roll downs), and extension ex.

- ❖ **Tips:** always check shoulder height, shoulder blades look for winged scapula. If injured, trapped nerve may occur. Check whether hips are level, crease of armpit, fold of glutes and knees. Check rotation in feet and fingers. Can also stand client in front of a white board or wall and observe the shadow.

Spondylosis

- ❖ More common in people over 50 due to wear and tear in the intervertebral disks and facet joints. Spondylosis tends to refer to the discs whilst osteoarthritis or degenerative joint disease tends to refer to the facet joints. Osteophytes (bony spurs) develop but this may be a normal part of the ageing process and does not necessarily cause the client pain.
- ❖ **Symptoms:** loss of movement and pain and stiffness in the cervical area. There may also be popping and grinding in the neck when moved. It can cause muscle spasms and headaches (originating in the neck). Sometimes, there is numbness and weakness in the arms, hands and fingers.
- ❖ Diagnosed from X-rays and scans
- ❖ Can be caused by poor alignment, trauma, and whiplash from a past injury or poor muscle patterning.
- ❖ **Treatment:** work to mobilise and stabilise within a pain free range at all times.
- ❖ Correct posture and biomechanics and avoid over-using superficial muscles. Concentrate on stabilising trunk and work out from there.
- ❖ Specific exercises for the neck would be to work the deep neck flexors.

Spondylolysis

- ❖ An acquired defect caused by fatigue fracture of the pars interarticularis. The defect is filled with fibrous scar tissue and is able to cause pain. It is usually unilateral but can be bilateral.
- ❖ **Diagnosis:** by X-ray
- ❖ **Treatment** pain relief and rest first, followed by stability work and then dynamic exercises to restore normal ROM.

Spondylolisthesis

- ❖ Instability around L5 due to bilateral defects in the pars interarticularis. The vertebra slips forwards on the sacrum. There are different grades of slip. It is rarely progressive in adults and teenagers.
- ❖ **Diagnosis:** by X-ray
- ❖ **Treatment:** stability dynamic work especially important.

Ankylosis spondylitis

- ❖ A chronic inflammatory disorder affecting the spine and sacro-iliac joints. It can also affect the hips, shoulders and TMJ's. Males are more affected than women.
- ❖ It is accompanied by low back and thoracolumbar pain, tiredness and stiffness after resting. The posture becomes stooped and they rely on diaphragmatic breathing.

- ❖ **Treatment:** maintain mobility and upright posture with minimal medication. Plenty of extension work.

Osteochondrosis

- ❖ Osteochondrosis (from the Greek "osteon" = bone and "chondron" = cartilage) is caused by changes to the disc's cartilage, with an accompanying reaction in the vertebral body.
- ❖ Degenerative changes can occur in any segment of the spine, i.e. in the cervical spine, thoracic spine or the lumbar spine. The height of the disc is reduced and the disc's physiological function is lost, resulting in instability and changes in the vertebral joints.
- ❖ This kind of back pain is very common and to a certain extent, is a normal sign of ageing.
- ❖ Possibly caused by an interruption of the blood supply to the bones of the vertebrae during early growth. The condition is common in adolescents.
- ❖ Basically, a degeneration of the vertebral joints which causes wear and tear to the cartilage on the joints and ultimately can lead to arthritis.

Osteoarthritis

- ❖ A condition where the joint cartilage wear and tear exceeds the cartilage replacement causing pain which restricts movement. Decreased joint lubrication perpetuates the problem. The inflammation and accompanying pain results in the client compensating their posture.
- ❖ **Treatment:** maintain range of movement; improve muscle strength and power, biomechanics, balance and diet.

Osteoporosis

- ❖ Decrease in bone density, which happens generally after menopause. 55% women have some degree on osteoporosis and 1 in 4 men. Depending on their T and Z scores limit flexion and work on trunk stability. Small extensions are fine.
- ❖ It is possible to reverse this degeneration.