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Chronic Low Back Pain:

Bio-psycho-social Model In The Physiotherapy Treatment

Low back pain is termed chronic when the pain lasts for more than 3 months. The literature and clinical practice show that chronic low back pain (CLBP) is a multi-faceted problem and requires a multi-dimensional approach in its treatment (Elvey and O'Sullivan, 2004; Mc Carthy et al, 2004; Waddell, 2004). The factors that require consideration when dealing with chronic low back pain include:

1. Patho-anatomical factors – structural pathology, indentify peripheral pain generator e.g. discs, z joints, neural tissues or myo-fascial
2. Physical factors- ergonomics, lifestyle, strength / conditioning, motor control, mechanisms of injury, adaptive/maladaptive motor response
3. Pain (Neuro-physiological factors)- peripheral sensitization, central sensitization, sympathetic nervous system activity
4. Psychological factors- personality type, beliefs and attitudes, emotions such as anger/fear/anxiety/depression and coping strategies such as being a confronter versus an avoider
5. Social factors- compensation- financial or emotional, relationships with family, friends and at work, cultural factors, support structure, work structure, socio-economic factors. (O'Sullivan 2005)

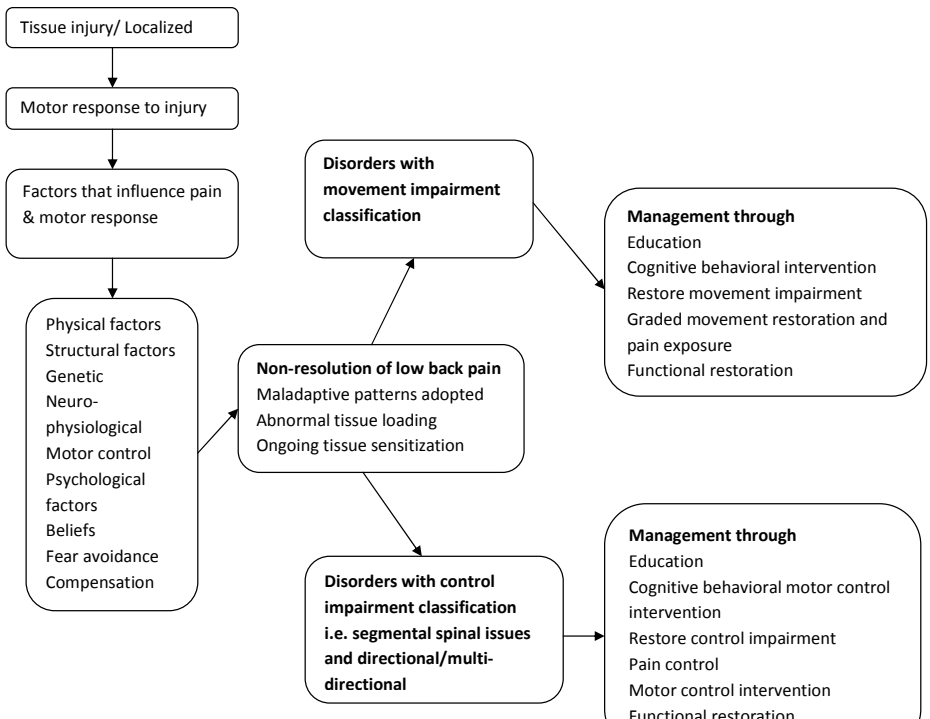
The relative contribution of the different factors and their dominance associated to CLBP will differ for each person. The role of the physiotherapist through clinical reasoning is to determine which factors are dominant in the patient, and whether the patient has adapted to the disorder positively or negatively.

A classification system of back pain disorder has been proposed by O'Sullivan (2005) to broadly categorize chronic back pain disorder. The classification indicates the possible mechanism of pain and hence a targeted approach in its treatment.

Only 15% of those suffering from CLBP have a specific pathology associated to their disorder (Nachemson 1999) and the remaining 85%have no radiological basis to their pain condition. This group represents a large group of "unresolved tissue strains and sprains". The challenge here is to identify the underlying pain mechanism and the diagnosis needs to be based on a different criteria other than radiology. It needs to be based on a bio-psycho-social model.

Most of the CLBP patients we see in clinical practice belong to the non specific low back pain subgroup with peripherally mediated pain. Within this subgroup, there are 2 types of impairment disorders 1) Control impairment disorder and 2) Movement impairment disorder.

Chronic Low Back Pain Caused Or/and Maintained By 'Movement' & 'Control' Impairments



Adapted from Elvey R.L., O'Sullivan P.B. A contemporary approach to manual therapy. Clinical Science and Practices of Manual Therapy.

Control impairment disorders. In this sub group, it is primarily a peripheral nervous system disorder resulting from a loss of functional control of a spinal segment in one or more directions. The loss of motor control can be in a flexion, extension, lateral shift or multi direction. In this newsletter, we will discuss the flexion pattern.

In the **flexion pattern**, the pain disorder is a result of a loss of motor control of the lumbar segment into flexion. This is associated with a loss of control of the segmental lumbar lordosis. This presentation:

- is more commonly found in men than women
- have a history of flexion injury and repetitive strain
- pain is provoked in flexion/rotational activities and postures
- pain is eased in a lordotic/extended postures

On objective assessment:

- there is a loss of segmental and regional lordosis in the lumbar spine in sitting, standing and bending
- Associated increased tone in upper lumbar and lower thoracic Erector Spinae muscles
- Pain is provoked by flexion loading and relieved by controlling segmental lordosis in a provocative task
- Generates extension through thorax

Treatment for the flexion pattern subgroup:

- To train and isolate anterior pelvic rotation. There are 2 aspects to this 1.Learning to dissociate the pelvis and the lumbar spine from the thoracic spine. Ensure isolated lumbar segmental extension without involvement of the thoracic erector spinae. 2. To train the localized lumbar spine extensors like the mutifidus.
- To identify and retrain the provocative postures and movement patterns. An example of this is to train neutral lordosis (with a relaxed thorax) with forward trunk control loading like in a functional task such as sit to stand. Ensure that the lordosis is maintained through out the movement. Need to look at training endurance of the lumbar spine extensors in static postures.
- Functional re-intergration. To increase the speed, load and complexity of the training as required which will depend on individual demands.
- Cardio vascular exercise to improve overall fitness.

In the **movement impairment disorder,** the disorder is derived from the peripheral nervous system associated with a painful loss of normal physiological movement of a spinal segment in one or more directions. In this group of clients, the history will support that normal movement was not restored following acute pain episode due to fear avoidance behavior, belief that pain is damaging and has been advised not to provoke pain. These are with people with insignificant radiological findings and are unable to differentiate a stretching discomfort from a physiological/structural pain. They present with muscle guarding in the direction of the pain and symptoms are relieved with gentle activity, heat and stretching. Again, this painful loss of normal physiological movement can occur in all directions. In this article we will look at the active extension pattern.

In the active extension pattern, the disorder is as a result of the lumbar segment "actively" held into extension.

This presentation:

- Found more commonly in women than men
- Injury is caused by extension or forward bending in the presence of hyperextension of the lumbar spine
- Pain is provoked with extension and forward bending activities and relieved with lumbar flexion

On objective assessment:

- Posture is hyper lordotic in sitting and standing
- There is no flexion relaxation of the erector spinae in late forward bending
- Segmental hinging in backward bending (usually found in L5/S1 region)
- Pain is provoked in extension loading
- Pain is relieved by reducing spinal lordosis

Treatment for active extension pattern:

- Reduce tone and train relaxation of the spinal extensors
- Focus on lower abdominals and gluteal control
- Train pelvic tilt to encourage lumbar spine flexion
- Train postures and functional activities with reduced anterior pelvic tilt and lordosis

These classification system and treatment approach is relatively recent, but there is evidence to support the effectiveness of this approach (O'Sullivan et al, 1997; Dankaerts et al 2006).

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