

## **Study Inclusion and Exclusion Criteria:**

### Target Population

Appropriate study subjects will be identified upon initiation of care (MD evaluation and/or physical therapy). They will have pain of less than or equal to two months duration, within the current pain episode. This may be the initial pain episode or the onset of a most recent episode of pain, preceded by at least a six month pain free interval. They will have focal disc protrusion with correlating radicular symptoms and possible radicular/neurological deficits. These radicular symptoms/signs are defined as pain or paresthesias below the knee, pain reproduction with straight-leg-raising and/or extension or quadrant maneuvers, and radicular pattern sensory, reflex or strength changes. These symptoms will be consistent with the level of nerve root impingement. Only subjects with radiculopathy primarily at L5 and/or S1, due to pathology at L4-5 and/or L5-S1 disc levels will be included. Those with canal and foraminal compromise due to disc protrusion at L4-5 with L5 > L4 signs and symptoms WILL be included. Those with predominantly degenerative stenosis, degenerative spondylolisthesis, or spondylolysis will be excluded. Subjects also need to have an eleven point Likert pain scale score greater than or equal to four. They will not have a history of prior epidural steroid injections within the prior year or prior lumbar surgery.

### Inclusion Criteria:

1. Low back pain episode less than or equal to 8 weeks in duration.
2. Visual analog score (VAS) or screening Likert pain scale score three day average and present pain of at least four/ten at baseline.
3. Age 18 to 64.
4. Subjects will have focal disc protrusion with unilateral radicular/neurological deficits or correlating radicular symptoms. These radicular symptoms/signs are defined as pain or paresthesias below the knee, pain reproduction with straight-leg-raising and/or extension or quadrant maneuvers, and radicular pattern sensory, reflex or strength changes. These symptoms will be consistent with their level of nerve root impingement and will primarily involve the L5 and/or S1 roots.
5. Those with canal and foraminal compromise due to disc protrusion at L4-5 with L5 > L4 signs and symptoms WILL be included.

### Exclusion Criteria:

1. Litigation.
2. Workers compensation.
3. Those receiving remuneration for their pain, e.g. disability.
4. Back pain greater than leg pain.
5. Significant scoliosis of > 10 degrees
6. Those unable to read English and complete the assessment instruments.
7. Spondylolysis, with or without spondylolithesis, degenerative spondylolithesis, or stenosis due primarily to degenerative bony or soft tissue changes.

8. Systemic inflammatory arthritis (e.g. rheumatoid, lupus).
9. Addictive behaviour, severe clinical depression, or psychotic features.
10. Significant lower extremity pathology that effects gait.
11. Sustained cervical or thoracic pain that is present at a level  $\geq 2/10$  on VAS.
12. Possible pregnancy or other reason that precludes the use of fluoroscopy.
13. Prior lumbar surgery
14. Prior epidural steroid injections for treatment of current episode or within the prior year
15. Bilateral radicular signs/symptoms (< 90% laterality of pain intensity or bilateral neurological signs)
16. No more than 2 PT sessions (2 if no direction specific exercise program given and centralization has not occurred) for current episode