The focus of this clinical pathway is spondylosis, also described as intervertebral disc degeneration with or without myelopathy or radiculopathy. These diagnoses refer to conditions of the intervertebral discs caused by degenerative changes associated most commonly with the natural consequences of aging (primary) but also occasionally with post traumatic degeneration (secondary). Most studies suggest no causative relationship between the development of spondylosis and factors such as lifestyle, height, weight, body mass, physical activity, cigarette and alcohol consumption, or reproductive history. The effects of heavy physical activity are controversial in a purported relationship to disc degeneration. It is extremely common in the population. In the US, more than 80% of individuals older than 40 years have lumbar spondylosis, increasing from 3% of individuals aged 20-29 years.

As the intervertebral disc ages, its hydrophyllic properties decline with resultant loss of disc height and increased mechanical instability. This results in greater tensile forces at the junction between the vertebral body margin and the outer margins of the disc and intervertebral ligaments. This in turn causes the formation of new bone excrescences seen at x-ray examination and described radiographically as osteophytes.

Often referred to as degenerative disc disease and spinal osteoarthritis, it is neither uniquely pathological nor inflammatory. By itself, spondylosis (or disc degeneration) is most likely not a cause for clinical concern. For example, lumbar spondylosis is present in 27-37% of the asymptomatic population and there is no greater frequency of signs or symptoms among individuals with osteophytes than among those without them. However, spondylosis is often seen with more morbid conditions such as acute and chronic pain, myelopathy and radiculopathy.

It has been long observed that a diagnosis of “spondylosis, disc degeneration opr arthritis” is not without consequence for patients. “The patient hears that there is a long-term structural difficulty with their spine or, even worse, is given a diagnosis of arthritis. Consequently, the patient takes care of his or her back and limits physical activity, which is a natural response to damage to an organ. This response runs directly contrary to current advice on the management of back pain, which emphasises active rehabilitation to prevent chronic disability, even in the face of continuing pain.”
Surgery is often recommended for patients with spondylosis in association with symptoms of disabling back or neck pain, radiculopathy, lateral or central stenosis. The evidence supporting surgery for degenerative lumbar stenosis is of variable quality and shows conflicting results with regard to a preferred surgical technique and patient centered outcomes. Given the uncertainty of invasive procedures, consideration of non-surgical alternatives seems warranted.

**Subjective Findings and History**
- Past medical history with documentation of diagnosis
- Age, family history
- Acute, subacute, or chronic spine pain. Often local, uni- or bilateral
- Referred limb pain and paresthesia

**Objective Findings**
- Loss of intervertebral disc integrity that is due to degenerative change associated with normal aging, immobilization or post-traumatic conditions
- Screen for “red flags”
- Radiographic examination: Evidence of degenerative changes on X-ray
- Loss of normal spinal ROM
- Palpation for tenderness
- Segmental joint dysfunction/subluxation
- Spasm of paravertebral muscle
- Orthopedic and neurological examination directed at differentiating scleratogenous from neurogenic pain
- Discogenic stress maneuvers often reproduce the patient’s low lumbar and referred symptoms.
- Provocative orthopedic tests MAY reproduce the pain (e.g. Straight leg raise and other tests that cause spinal motion may increase back pain)

**Assessment**
Disc degeneration should be considered a secondary diagnosis and may accompany an acute injury. The clinical impression should indicate the specific anatomical structures (spinal level) involved and clinically correlate them with the mechanism of injury, history, subjective complaints, and objective findings. Be alert to possible psychosocial and economic issues or personality disorders.

Kirkaldy-Willis described a pathophysiologic model that occurs in 3 phases of a continuum with gradual transition from one to the next. However, great variation of phases can be expected in different discs in any given individual and individuals of similar ages vary greatly.
- Phase I, the dysfunctional phase, is characterized histologically by circumferential tears or fissures in the outer annulus. Changes to the zygapophyseal joints during the dysfunctional phase may include synovitis and hypomobility. The facet joint may serve as a pain generator.
- Phase II may result from progressive loss of mechanical integrity of the trijoint complex. Disc-related changes include multiple annular tears (eg, radial, circumferential), internal disc disruption and resorption, or loss of disc-space height. Changes in the zygapophyseal joints include cartilage degeneration, capsular laxity, and subluxation. The biomechanical result of these alterations leads to segmental instability. Clinical syndromes of segmental instability, IDD syndrome, and herniated discs.
• Phase III, stabilization, is characterized by further disc resorption, disc-space narrowing, endplate destruction, disc fibrosis, and osteophyte formation. Discogenic pain from such discs may have a higher incidence than that of the pain from the discs in phases I and II;

**Plan**

Spondylosis by itself may not require treatment. Spondylosis however is often associated with symptomatic conditions, for example, axial spine pain, referred pain, intersegmental dysfunction or radicular syndromes, all of which may require therapeutic intervention. There is a growing body of evidence based treatment recommendations for conditions associated with spondylosis. An appropriate treatment plan should address the pathomechanics and clinical sequelae that attend each phase of disc degeneration as well as any associated disorder (e.g. pain, dysfunction, radicular syndrome).

**Passive Care:**
- Spinal manipulation and/or mobilization with exercises
- Physical therapy modalities low level laser therapy
- Medications: OTC NSAIDS, mild analgesics, herbal medicines
- Supplementation.

**Active Care:**
- Education is one of the most important components of any back-care program and should include an explanation of the natural history of acute, subacute, and chronic disc problems
- Weight loss when indicated
- Active exercise for mobility and strength
- Posture training
- Activity/work restriction, if appropriate
- Smoking cessation.

**Length of Treatment**
- Conservative therapy: 3-6 months.

**Referral Criteria**
- Referral to an appropriate non-surgical spine specialist if no improvement noted after 6-8 weeks
- Consultation with a spine surgeon may be appropriate for patients with intractable severe function-limiting symptoms, for those with symptoms lasting longer than 6 months who have had no relief from nonsurgical approaches, and for persons with abnormal neurologic findings.

**Resources for Clinicians**
eMedicine from WebMD. Lumbar spondylosis. Bruce M Rothschild, MD
http://www.emedicine.com/med/topic2901.htm

eMedicine from WebMD. Lumbar degenerative disc disease. Rajeev K Patel, MD.
http://www.emedicine.com/PMR/topic67.htm
The Evidence

Calliet R: Neck pain and disability. (incomplete)


Haughton, V.; Medical Imaging of Intervertebral Disc Degeneration: Current Status of Imaging. SPINE. 2004 DEC Vol. 29(23) Pgs. 2751-56


**Clinical Pathway Feedback**
CHP desires to keep our clinical pathways customarily updated. If you wish to provide additional input, please use the email address listed below and identify which clinical pathway you are referencing. Thank you for taking the time to give us your comments.

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