

'Non-Specific' Versus 'Specific' Low Back Pain: A Neurosurgical Perspective on a Forensic Approach to Diagnosis and Causation in Spinal Medicolegal Matters

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1. Overview

Low back pain is recognised as a highly common symptom reported worldwide, with a prevalence correlated to a country's human development index. [13] 'Non-specific' low back pain has been defined as being without known pathophysiology, while its 'specific' counterpart has identifiable pathophysiology and is often taken to be reflective of a more serious condition.[6] However, in a medicolegal context, the presentation of low back pain (with or without related neurological symptoms) is typically associated with circumstances attributed to occupational duties and/or workplace spinal trauma. Here, categorizing between 'specific' and 'non-specific' low back pain is akin to distinguishing if an assessee's clinical presentation has a plausible and identifiable physiological and anatomical basis versus, for example, a psychogenic one influenced by the compensation/litigation umbrella itself, [2,16,19] or some biopsychosocial combination. To facilitate arrival at an accurate diagnosis with a sound understanding of causation, a forensic (that is, systematic, comprehensive, analytical, and impartial) method should be used by the expert assessor (Figure 1). As neurosurgeons who regularly undertake independent medical examinations (IMEs), the present Editorial summarises the authors' clinical approach in relation to spinal diagnostic and aetiological opinion, irrespective of perceived complexity.

2. Prevalence of 'Non-Specific' Versus 'Specific' Low Back Pain

The point-prevalence of low back pain in the general adult population is of the order of 10-20%,[6,13] while its lifetime prevalence is approximately 40%.[6] In 2016 *Lancet*[13] and 2022 *New England Journal of Medicine*[6] publications

reviewing the subject of non-specific low back pain, the authors state "low back pain is a symptom rather than a disease",[13] where 'non-specific' low back "is diagnosed on the basis of the exclusion of specific causes, usually by means of history taking and physical examination".[6] In relation to the role of imaging in individuals deemed to have 'non-specific' low back pain (i.e., around 90% of those reporting low back pain in the primary care setting),[13] it was proposed that "imaging is not routinely indicated",[6] and that "diagnostic investigations have no role in the management of non-specific low back pain".[13] On the other hand, 'specific' low back pain (i.e., around 10% of those reporting low back pain in the primary care setting),[13] was found to be from compression fracture (4%), spinal stenosis (3%), non-spinal visceral disease (2%), or neoplasia or infection (1%).[13] Independently lending substantial support to the aforementioned publications,[6,13] following a systematic review analyzing data from 33 journal articles reporting spinal imaging findings in 3,110 asymptomatic adults, almost all via magnetic resonance imaging (MRI), Brinjikji, et al.[4] reported that disc desiccation (loss of disc height and hydration) and/or disc bulging to be present in more than 50% of asymptomatic individuals between the ages of 30 and 39 years and in almost 90% of people over the age of 60 years. Between the ages of 20 and 80 years, linear increases in the incidence of most of the radiological pathology were noted along consecutive decades (more steep for disc desiccation and bulging and less steep for annular fissures and disc protrusions), although parabolic increases were noted for facet degeneration and spondylolisthesis. [4] Such findings indicate degenerative changes to be an integral part of natural ageing. However, the fundamental messages from the aforementioned publications [4,6,13] raise an

important question in the context of medicolegal matters. That is, how does one determine the anatomical origin of low back pain in symptomatic adults when a sizeable proportion of asymptomatic

adults have radiologically evident structural pathology in their spines? The answer probably lies in the application of a forensic approach to each and every IME involving the spine (Figure 1).

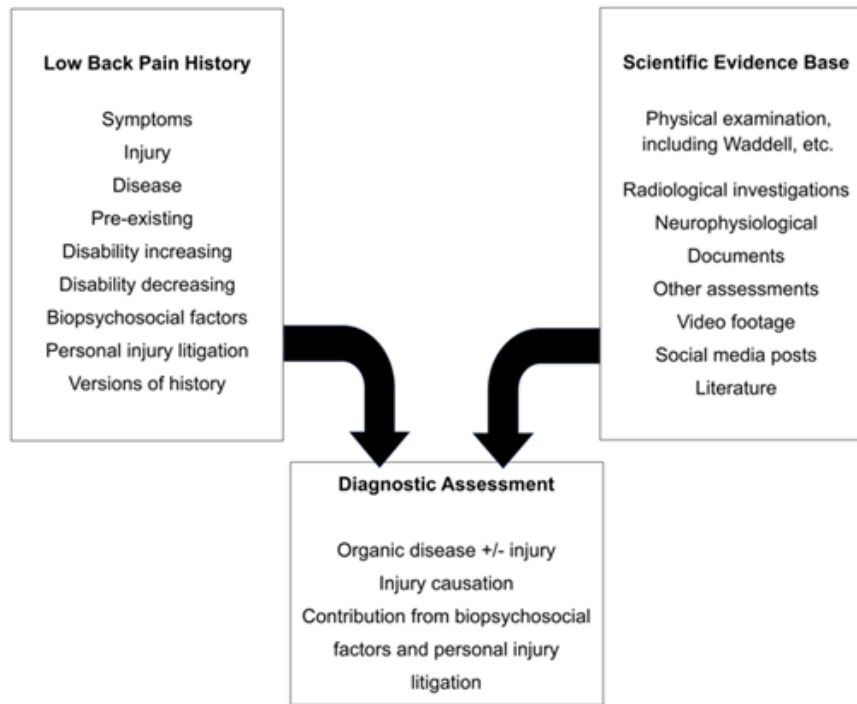


Figure 1: A forensic approach. ‘Non-specific’ versus ‘specific’ low back pain in the broader community takes on a somewhat different meaning in the context of a medicolegal matter involving potential compensation. For the latter, via IMEs, the methodology used to accurately diagnose the presenting condition and apportion the probable factors contributing to it[12] needs to be rigorous. This necessarily includes: (i) a careful and thorough history, comparing with versions which the subject may have recounted to other doctors and healthcare professionals; (ii) a careful and thorough physical examination (seemingly less common in today’s world), with one’s findings to be compared with those of other healthcare professionals; (iii) careful study (most powerfully, at a single sitting) of the actual images of all of the relevant radiological investigations which can be obtained (with consideration given to including annotated significant images with the report); and (iv) at least some acquaintance with the literature on learned pain behaviour.

3. A ‘Forensic’ Approach

3.1. Comprehensive History and Examination

The fundamental principles of history and examination are second nature to clinicians. In the special context of an IME, these have been described elsewhere. [12] What makes a diagnostic approach ‘forensic’ is the degree to which a combination of four key elements is applied by the examining specialist. These key elements, reflective of the scientific method, are being systematic, meticulous, analytical, and impartial. The antithesis of this would be a *prima facie* approach, omitting or minimizing such elements, thereby predisposing an opinion to a perception of dogmatism, bias and/or inaccuracy. In the setting of an assessee presenting with low back pain (with or without related neurological symptoms), the method of application of a forensic approach towards categorizing the presentation as ‘non-specific’ versus ‘specific’ based on history, passive observations, and physical examination are detailed separately. [1,12,19]

3.2. Multimodal Investigation Review

From the perspective of medical investigations, a forensic approach will involve the direct review and analysis of the assessee’s available imaging studies (now commonly accessible in electronic formats and archives), including a careful comparison between serial scans of a similar technological nature. The authors have found in a combined several decades of neurosurgical practice and medicolegal consulting, spinal radiological reports to be helpful overall, but at times insufficient to rely upon. Namely, in some instances where comparisons with previous scans that could have been made by the reporting radiologist were not made, or where certain diagnoses (e.g., from a list of spinal conditions tabulated elsewhere)[12] were missed or incompletely reported. In both a clinical and IME context, multiple imaging modalities would appear to be ideal given the different types of data that can be gleaned from various imaging sources. For example, standard computerized tomography (CT) and MRI provide valuable structural information regarding the anatomical state of spinal bony

and soft tissues (discs, facet joints, ligaments), as well as paraspinous musculoligamentous structures. However, an important nuclear medicine study such as regional or whole-body single-photon emission computerized tomography (SPECT) can add valuable physiological information such as blood flow (i.e., imaged tissue perfusion). In the context of the spine, SPECT is used to detect, with high sensitivity, a variety of pathologies such as infection, trauma, inflammation, active degeneration, and neoplasia. On the other hand, the utilization of flexion versus extension lateral spinal X-rays and even upright, multipositional MRI adds a dynamic dimension to knowledge of what spinal tissues are subjected to in a motion-dependent manner, versus the standard static and supine CT and MRI body position. Beyond imaging, at times there is need for objective electrophysiological clarification and confirmation of a clinical presentation, via comprehensive multi-limb nerve conduction studies (NCS) and electromyography (EMG). At other times, rheumatological and infective/inflammatory biomarker studies from blood samples are of added value. Together, the aforementioned investigations, especially in combination, can aid in establishing an accurate diagnosis, while patterns of radiological pathology (in, e.g., multiregional spondylosis, diffuse hyperostosis, Scheuermann's disease, kyphoscoliosis, spinal canal diameter anomalies, and isthmic spondylolisthesis) can augment an understanding of causation. [12]

3.3. Medical Records and Literature Substantiation

Beyond the value of an expert's personal training and experience, their meticulous review of the documentary file and thorough knowledge of the relevant medical literature are also prerequisites to a forensic approach. Serial records from medical and allied health personnel not only at and after the time of the reported 'index' injury (contemporaneous), but also well before it (i.e., pre-injury records, even temporally remote ones, if available) can shed valuable light on aetiology. To the authors, these appear to be more useful than a reliance on history obtained much later than the index event(s), which might be subject to inadequate recall or, at times, even embellishment. In considering matters where multiple medical practitioners have examined the assessee, looking for consistency versus inconsistency in documented history as well as in physical examination is integral to understanding whether an assessee's direct communication can be relied upon, and if there is active pain behaviour or 'functional overlay'[2,16,19] (indicated not only by the presence of certain anomalous observations, [12,19] but also by the presence of substantial interspecialist variations in observations and examination findings). [12] In the setting of less common spinal conditions, some named below, that might be missed by a clinician with a resultant erroneous 'non-specific' low back pain categorization (i.e., non-diagnostic), sound knowledge of the medical literature can be quite revealing and, where practicable, should be directly checked against the imaging undertaken (i.e., beyond pure reliance upon radiological reports).

As examples, see the papers pertaining to often overlooked yet aetiologically low back pain-generating spinal conditions including: scoliosis, [5] lumbar lordosis, [7] sacroiliac joint disease, [8] Baastrup's disease ("kissing" spinous processes), [9] isthmic spondylolisthesis [10], Bertolotti's syndrome, [17] diffuse idiopathic skeletal hyperostosis (DISH), [20] as well as the adverse spinal effects of obesity, [18] smoking, [11] and congenital spinal canal narrowing. [15] Furthermore, the role of genetic versus occupational factors in low back pain and spondylosis, [3,14] as well as non-organic [1,19] (non-physiological, non-anatomical) or psychogenic aetiology [2,16] needs to be part of a broad-thinking, biopsychosocial paradigm considered in IMEs.

4. Conclusion

In the context of spinal medicolegal matters, 'non-specific' versus 'specific' low back pain takes on a somewhat different meaning compared with the broader community. [6,13] The methodology used to accurately diagnose the presenting condition and apportion the probable factors contributing to it [12] needs to be rigorous in an IME (Figure 1). Applying a balanced and analytical (as opposed to *prima facie*) approach to the metadata should facilitate not only the establishment of the probable diagnosis and its causation, but also determination of appropriate medical management, prognosis and any due compensation.

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