

It is time to stop causing harm with inappropriate imaging for low back pain

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Inappropriate imaging for low back pain (LBP) can cause harm in three ways:

1. Misinterpretation of results by clinicians resulting in unhelpful advice, needless subsequent investigations (downstream testing) and invasive interventions, including surgery;¹
2. Misinterpretation of results by patients resulting in catastrophisation, fear and avoidance of movement and activity, and low expectations of recovery;²
3. Side effects such as exposure to radiation.³

Problems associated with excessive imaging for LBP are well recognised (<http://www.choosingwisely.org>) and useful evidence-based guidelines have been developed to help clinicians determine when investigation is appropriate.³ However, currently, 42% of patients with LBP receive an X-ray, CT or MRI within 1 year of diagnosis, and of these, 80% receive imaging within 1 month of presentation.⁴ The uptake of imaging guidelines is likely to be similarly insufficient among the sports medicine community, where lumbar imaging is frequently used.

As well as recognising when imaging is appropriate, evidence-based reporting and interpretation of imaging findings is critical. The contents of imaging reports strongly influence clinicians' beliefs, the advice they provide patients and the clinical management decisions they make, which in turn impact on patient beliefs and behaviours. While imaging provides a detailed description of a person's spinal structures, so-called abnormal findings are increasingly prevalent with age in asymptomatic populations⁵ and correlate poorly with a person's level of pain and

disability.⁶ Early use of MRI for LBP results in increased disability, poorer perceived prognosis and a greater chance of back surgery.¹ Patient interpretation of images, the accompanying report and explanation of their meaning can lead to beliefs that their spine is damaged and structurally vulnerable, resulting in fear and subsequent avoidance and protective behaviours.² As patient portals develop, allowing patients increased access to their reports, this effect is likely to further increase.

LET US MAKE IMAGING REPORTS CLEAR FOR CLINICIANS AND PATIENTS

Consistent language

The myriad of terms used when reporting on lumbar imaging is confusing both for patients and for clinicians. For example, the distinction between a disc protrusion, extrusion or herniation is often unclear and interpreted variably by different radiologists. Many terms, such as degeneration, annular tear, disc bulge and herniation, can enhance threat and contribute to negative beliefs that are potential barriers to recovery. It is time for consistent, patient-focused terms to be developed which communicate investigation findings in a clear and minimally threatening manner. Consistent language could be organised in a standardised, checklist like fashion (as is the case with synoptic reporting) to enable better use of data for clinical research.⁷

Epidemiological information

Mandatory reporting of age-matched prevalence rates of imaging findings for asymptomatic populations has the potential to educate clinicians and patients while decreasing the threat associated with these findings. Simply including an epidemiological statement with MRI reports has been found to decrease the use of narcotic medication for patients with LBP or radiculopathy.⁸

Assessment of relevance

The differentiation between normal age-appropriate imaging findings and those which may be clinically relevant is largely

unknown. Therefore, only reporting findings that *may* hold clinical relevance will make reports more meaningful and less threatening. For example, fractures, stress reactions, severe disc degeneration, end plate changes (modic type 1) and disc herniations with nerve compression are more strongly correlated with LBP and/or leg pain, and should be reported within the context of the clinical situation. However, the fact that these findings generally have a positive natural history should be made clear in reports. In contrast, moderate disc degeneration, disc bulges and protrusions, annular fissures, disc space narrowing, low-grade spondylolisthesis and facet joint arthrosis correlate poorly with LBP. Reporting that these findings may not be clinically relevant due to their prevalence in asymptomatic populations should be considered.^{5, 6}

Radiologists will be better placed to provide meaningful interpretations if referrers provide comprehensive information about the patient, their presentation and the reason for the investigation. This would help radiologists to prioritise findings which are relevant to the clinical context and the patient's age.

THE WAY FORWARD

Sports medicine professionals are high users of imaging and quick adopters of innovation. The latter provides an opportunity to lead the way in reducing the harm associated with inappropriate imaging referrals and threatening imaging reports, which can lead to the misconception that LBP is always caused by structural pathology. An important first step would be referrers demanding clear, evidence-informed and clinically relevant reports which include age-specific epidemiological information based on radiological studies of asymptomatic individuals.^{5, 8} Work needs to be undertaken to develop a taxonomy of appropriate report terms which are acceptable, informative and helpful for radiologists, sports medicine professionals and patients alike. In addition, imaging appropriateness can be improved by point-of-care decision support which embeds red flag symptom recording in electronic referrals.⁹ Together, these measures may lead to a reduction in the disability burden and distress related to LBP.

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