

Personalised Care for Low Back Pain

Top 10 Things to Know

1. Everyone with back pain is different.
2. Not all back pain is the same.
3. Treatment should relieve suffering, and aim to achieve functional goals.
4. Different treatments work for different problems, at different times in different people.
5. Some people are more likely to have side effects than others.
6. Not all treatments can be accessed and not all are acceptable to all people.
7. Predicting what will happen to an individual is an imprecise science.
8. Personalised and stratified care are different things; stratified care may be cost effective, personalised care might increase satisfaction.
9. Treatments only work if they are used; shared decision making can be motivating.
10. Informed treatment choice requires personalised information addressing individual perspectives on benefits and risks.

Low back pain is a complex problem driven by multiple biological, psychological and social mechanisms. A range of pathologies might be associated with pain, although pain's precise drivers in an individual at any given time can be difficult to define, and structural pathology might be absent. In children, structural pathology such as spondylolysis might be detected, but is often absent. Complex radiographic changes of spondylosis, including disc space narrowing or reduced signal on T2 weighted MRI images, disc bulging or prolapse, end plate sclerosis and Modic changes, marginal osteophytes and facet joint osteoarthritis might each indicate pathologies associated with pain. However, these radiographic changes are frequently found in people without pain from late childhood, and are only weakly associated with pain severity. Radiographic findings change little despite widely fluctuating pain. Much low back pain may result from muscle spasm or peripheral neuronal sensitisation. Augmentation of pain by neuronal processing within the spinal cord and brain (e.g. central sensitisation) may contribute to pain severity or widespread localisation, and changes in brain functional connectivity may contribute to emotional, cognitive and motor difficulties in low back pain. Mechanical stimuli trigger back pain during movement, and pain may flare following acute injury or for no apparent reason. Pain may be localised to the spine, radiate or be referred to non-spinal regions, for example where nerve roots are irritated or compressed, or due to the imprecise somatotopic representation of deep spinal structures. Low mood, anxiety, fear avoidance, catastrophizing, cognitive interference, beliefs and other psychological factors are components of the pain experience. Symptoms and signs may reflect pain mechanisms, changing during the day, from week to week or over longer time periods. Each individual may present with their own comorbidities and risk factors.

Evidence-based guidelines support treatments that are effective for patients grouped according to common diagnosis. Diverse treatments are available for low back pain (medical, physiotherapeutic, psychological, etc). Although exercise and activity should be encouraged for all people with low back pain, few specific interventions display unequivocal benefit in high quality randomised controlled trials. Individuals who present to health care professionals represent only the tip of an iceberg of a back pain epidemic, sometimes reflecting a presumption that healthcare will not meet their individual needs. Stratified and personalised care attempts to more closely match relevant treatment to the individual, and thereby improve outcome.

Attempts to stratify homogeneous subgroups likely to benefit from specific interventions for low back pain have been widely adopted. For example, decompressive surgery may be indicated if magnetic resonance images display pathology concordant with neuropathic symptoms and signs. Patient stratification by detecting modifiable risk factors for poor prognosis in people with acute low back pain has been popularised with the STarTBack questionnaire [1]. Patients at their first point of healthcare contact during an episode of back pain may be allocated, based on questionnaire responses to simple advice, supervised physiotherapy or more intensive (and expensive) physiotherapist-delivered cognitive-behavioural-based intervention. This might help avoid costly and intensive treatments for those likely to improve spontaneously [2]. More widespread use of STarTBack for people with subacute or chronic low back pain in secondary care settings awaits clear evidence of benefit.

Personalised care recognises that no two individuals are the same, even within stratified subgroups, and requires shared decision making between patient and clinician. Treatment choice depends on not only likely benefit, but also risks of adverse events and the patient's personal perspective, values and understanding. Low back pain with its multiple treatment modalities is an ideal candidate for personalised care. Sharing information to enable patients to make fully informed decisions can be time consuming. Written and web-based information (e.g. <https://www.eurospinepatientline.org/>, <https://www.versusarthritis.org/about-arthritis/conditions/back-pain/>) and multidisciplinary teams support personalised care and patient involvement in decisions, and can facilitate self-care. Personalised care and patient choice should always reinforce core advice on movement and activity, and discourage exclusive focus on less effective treatment options.

Provision of personalised care requires an informed clinician who can help a patient to reformulate unhelpful beliefs, and choose appropriate treatment. Important considerations when choosing between treatments include efficacy (will it work, when and how much?), and risk or nature of adverse events. Organisational factors include convenience and treatment accessibility. Individuals of different ages, sex, ethnicity and educational background balance treatment characteristics differently and make different choices. Treatment responses and adverse events might differ according to the patient's genetic constitution, comorbidities or concurrent treatments. For example, non-steroidal anti-inflammatory drugs (NSAIDs) might be effective in randomised controlled trials, but fewer than half of trial participants gain clinically important benefit above placebo. NSAIDs might work better in people without central sensitisation [3]. Gastrointestinal adverse events may be more common in those over the age of 50 and not taking a proton pump inhibitor, and cardiovascular risk is greatest in those with

hypertension, hyperlipidemia or previous cardiovascular events. Individuals with low back pain are heterogeneous. Pain relief may be deemed the most important characteristics of a medical treatment [4], whilst achievable functional goals are key for those whose pain cannot be relieved.

Predicting benefit and harm from individual treatments for chronic low back pain is an imprecise science. Mechanistic stratification based on diagnosis, clinical, imaging or laboratory tests makes intuitive sense, and creates a treatment context that might motivate adherence and facilitate both specific and placebo responses, and improve patient satisfaction. If one treatment fails, another may be tried, and if pain mechanisms or patient perspectives change, then treatments that have failed might later be successful. However, this 'try it and see' approach might itself cause harm if it discourages treatment persistence or self-care, if failures encourage despondency, or have financial and personal burden. More effective prediction tools are needed to help people reliably choose treatments that will best provide timely benefit. Randomised trials should confirm patient benefit from stratification and personalised care by comparison with other ways of allocating treatments. For the present, matching investigations and explanations to available evidence-based treatments can help people with chronic low back pain.

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