

Title: Back pain: a target for reducing hospital admissions?

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The issue of low-value back pain care in primary care has been widely discussed, particularly around the liberal use of imaging and opioid analgesics. Much less consideration has been given to hospital admissions, which account for half of the healthcare costs attributable to back pain and are often unnecessary. Since *The Lancet* Low Back Pain Series was published in 2018, new evidence has emerged on the drivers for admitting patients with back pain, harms of hospitalisation, and potential alternatives, such as hospital in the home and virtual care models.

In England, back pain was the primary reason for 456,193 Emergency Department (ED) visits and 133,317 hospitalisations in 2021–22.¹ In Australia, a third of people attending an ED with back pain are admitted to hospital and the rate of hospitalisation has increased for the tenth consecutive year, currently at 664 per 100,000 people.² In the US, back pain is the primary diagnosis for over half a million inpatient admissions and a secondary diagnosis for a further 2.7 million – these admissions account for 15 million hospital days, which is 8% of the total for all causes.³

Many of these hospital admissions are potentially preventable. A study at three large, public hospitals in Sydney, Australia found that 57% of 1,982 people with back pain admitted via ED had a discharge diagnosis of non-specific or radicular back pain,⁴ which suggests a lack of medical urgency surrounding these admissions. Only 14% were diagnosed with serious spinal pathology (such as vertebral fracture) and 24% with pathology outside the lumbar spine, such as urological or gastrointestinal conditions.⁴ Although differential diagnosis can be challenging in patients with back pain, these findings suggest that many hospital admissions could have been avoided through appropriate community-based management and alternate care pathways.

Back pain admissions can last for several days and so can be extremely costly. The median length of stay in Australia is six days and the mean cost per admission is AUD14,949 (GBP8,310) or AUD392.9 million (GBP218.1 million) per year.⁵ In the US, the mean length of stay for a back pain admission is 3.1 days leading to USD78,151 (GBP63,471) in hospital charges per stay or USD40 billion (GBP32.5 billion) in total annually.³ This prolonged hospital stay does not come without harms and can lead to hospital-acquired complications such as infections and falls.^{4,6} Considering that many back pain admissions are potentially avoidable, alternate care pathways could result in improved patient experience, reduced risk of harm and substantial health resource savings.

Opioids and sedatives are commonly administered to inpatients with back pain. In an Australian study of 712 admissions, opioid-based analgesics were almost universally administered (97%), with a quarter (23%) reporting an opioid-related complication.⁶ A 2022 study of 1982 admissions across three Sydney hospitals found that opioids in combination with sedatives (including antidepressants, anticonvulsants and benzodiazepines) were given to one-third of inpatients with back pain.⁴ Although many of these patients were admitted

principally for pain management, a judicious approach to opioid use is required given lack of evidence of benefit in this population and clear evidence of harms, particularly if combined with other sedatives or continued long-term.⁷

Diagnostic work-up such as lumbar imaging and laboratory tests is another potential reason for back pain admission. The two Australian studies reported that three-quarters of people admitted with back pain undergo plain radiographs and 36% receive advanced imaging, such as CT and/or MRI.^{4,6} Blood tests are performed in 84% of these patients with the top five orders being full blood count, urea and electrolytes, liver function, c-reactive protein, and minerals involved in bone homeostasis (calcium, magnesium and phosphate).⁴ These tests can however be safely performed in the outpatient setting and do not themselves require hospitalisation.

Despite evidence that most people with back pain who are admitted do not require treatment in hospital, some will benefit from admission. People with a suspected underlying serious pathology and those with progressive neurologic deficit may require admission to allow more diagnostic work-up than is possible in a busy ED setting. Inpatients with back pain are generally older and around 78% have other comorbidities,⁶ with the most common being psychiatric problems, diabetes, and cardiovascular diseases. Some may also have pre-existing functional limitations that – in the presence of severe back pain – prevent them from performing essential functions independently at home.

However, there is now evidence to help us identify potential treatments for back pain that can be delivered at home or in the outpatient setting, and so prevent hospital admission. A systematic review of hospital in the home for low-acuity or chronic conditions has shown early supported discharge or admission avoidance models can meaningfully reduce length of hospital stay (mean difference –6.8 to –4.4 days) and readmissions (relative risk 0.68 to 0.98), while achieving comparable outcomes to inpatient care.⁸ These models could be applied in back pain, for example, by implementing virtual hospital clinics that accept referrals directly from the ED and inpatient units. A recent trial in the US showed that a virtual hospital model resulted in 38% lower costs as well as fewer diagnostic tests and consultations.⁹ There is however a lack of evidence of these models specifically for people with back pain.

Most back pain admissions occur via ED. Although these consultations can be challenging, specific strategies targeting known barriers to community discharge can help prevent admissions. Some barriers reported by ED clinicians include fear of missing serious pathology, severe physical limitation, lack of physiotherapy staff in ED, lack of awareness or availability of alternate pathways, and performance-based targets such as the ED four-hour standard.¹⁰ People from minority ethnic groups, and those not fluent in the majority language have increased risk of admission and prolonged length of stay.⁶ Hospitalisation in these cases may be requested to obtain objective test results and screen for underlying serious condition, which suggests that clinician-patient communication plays a crucial role in this process.

There might be different challenges in different healthcare systems. For instance, financial incentives to admit patients in health systems supported by fee-for-service reimbursement.

A cultural shift is required to change ED and hospital care of people with back pain. Tailored education can help clinicians follow guideline recommendations and recognise that hospitalisation may not improve outcomes for most people with back pain. This must be implemented alongside rapid access to outpatient allied health services, translating and interpreting services to ease communication, health literacy programmes to address misconceptions, and alternate pathways (such as hospital in the home or virtual hospital care) to help reduce unnecessary back pain admissions.

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