










Rapid magnetic resonance of the lumbar spine was not better than radiographs for evaluating low back pain

Jarvik JG, Hollingworth W, Martin B, *et al.* Rapid magnetic resonance imaging vs radiographs for patients with low back pain: a randomized controlled trial. *JAMA* 2003;**289**:2810–8.

Clinical impact ratings GP/FP/Primary care ★★★★★☆☆ Rheumatology ★★★★★☆☆

Q In patients with low back pain (LBP), are there clinical or economic consequences when replacing lumbar spine radiography (LSR) with rapid magnetic resonance imaging (MRI)?

METHODS

	Design: randomised controlled trial with 12 months of follow up.
	Allocation: concealed.*
	Blinding: blinded (outcome assessors.)*
	Follow up period: 12 months.
	Setting: 4 imaging centres in Western Washington State, USA.
	Patients: 380 patients >18 years of age (mean age 53 y, 56% women) who had LBP with or without radiating leg pain referred for radiographs of their lumbar spine. Exclusion criteria included lumbar surgery within 1 year before enrolment, history of acute external trauma, metallic implants in the lumbar spine, any contraindications for MRI, lack of a telephone, pregnancy, and inability to speak English.
	Intervention: 190 patients each were allocated to lumbar spine evaluation by MRI or LSR.
	Outcomes: back related disability (0–23 point modified Roland questionnaire with higher scores indicating worse function) measured at 3, 6, and 12 months of follow up; patient reassurance; and costs (2001 US dollars).
	Patient follow up: 89%.

*See glossary.

MAIN RESULTS

At 12 months, the groups did not differ for back related disability (table). The study had 80% power to detect a difference of 2 points on

the modified Roland Scale. However, patient reassurance was greater in the MRI group than in the LSR group (table). The groups did not differ for total societal costs (table).

CONCLUSION

In patients with low back pain, replacing lumbar spine radiography with rapid magnetic resonance imaging did not have clinical or economic consequences.

Commentary

MRI is an attractive alternative to LSR for investigating LBP. It provides more diagnostic information and avoids unnecessary radiation exposure. The study by Jarvik *et al* is the first to compare these 2 approaches in a randomised controlled trial of patients attending a variety of physicians working in primary and secondary care.

A possible limitation of the study is that only patients referred for LSR were included. These results might not be generalisable to those referred directly for MRI by their physicians. Additionally, the use of spinal imaging varies internationally so these results, especially the cost findings, might not be generalisable to other healthcare systems.

The groups did not differ for back related disability. The limits of the 95% CI for the difference in the modified Roland score were less than the pre defined smallest clinically important difference of 2. Although this study was not designed as an equivalence study, this narrow confidence interval suggests that clinicians could refer their patients for either MRI or conventional LSR without affecting clinical outcome. It is also noteworthy that patients randomised to MRI were substantially more reassured by the test. However, this study was not large enough to draw firm conclusions about other important outcomes, such as cost. The tendency for higher costs in the MRI group may reflect additional interventions for abnormalities identified by MRI. Overall, this study does not support replacing LSR with MRI for patients with simple back pain. MRI does not improve clinical outcome and may be more expensive. It also might result in more patients having surgical procedures.

However, it is not clear whether patients with simple back pain benefit from any imaging procedures. Other studies suggest that LSR does not improve outcome.¹ In this study, no participants in either group had malignancy or infection. Based on data from this study, routine use of MRI for patients with simple LBP cannot be recommended. It did not improve clinical outcome, may increase costs, and did not identify any occult serious pathology.

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1 Kendrick D, Fielding K, Bentley E, *et al.* Radiography of the lumbar spine in primary care patients with low back pain: randomised controlled trial. *BMJ* 2001;**322**:400–5.

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Sources of funding: Agency for Healthcare Research and Quality and National Institute for Arthritis and Musculoskeletal and Skin Diseases.

Lumbar spine evaluation by rapid magnetic resonance imaging (MRI) v radiographs in low back pain at 12 weeks*

Outcomes	Rapid MRI	Radiograph	Difference (95% CI)
Back pain related disability (mean MRS score)	9.3	8.8	0.59 (–0.87 to 1.70)†
Patient reassurance (mean of 5 point scale)	3.2	2.5	0.68 (0.35 to 0.99)††
Total societal costs/patient (2001 US dollars)	2380	2059	321 (–458 to 1100)

*MRS = 0–23 modified Roland Scale (higher score indicates worse health).

†CI (defined in glossary) from analysis of covariance adjusted for baseline score and study site.

††Significant difference favours rapid MRI (higher score indicates greater reassurance).