



Topic Exploration Report ¹

Spinal braces for mid-thoracic stable fractures

What is a Topic Exploration Report?

Topic Exploration Reports are not health technology assessments. These reports provide a high-level briefing on new topics submitted to Health Technology Wales and are not based on exhaustive or systematic literature searches. Instead, they rely on a focussed scan of key resources.

What evidence is used in a Topic Exploration Report?

Priority is given to summarising the most relevant or useful evidence, rather than covering all possible evidence. Information reported is typically based on abstracts and study authors' own conclusions, rather than detailed scrutiny of full texts.

What are the aims of a Topic Exploration Report?

Topic Exploration Reports offer an overview of the available evidence on a topic and aim to highlight any uncertainties or gaps in the evidence. These reports outline the quantity and type of evidence found, but no critical appraisal or formal evidence synthesis is conducted.

How should a Topic Exploration Report be used?

Topic Exploration Reports can be used to indicate what evidence may be available for a topic, and do not provide definitive guidance on how a technology should be used. The evidence presented within the reports should be interpreted with caution.

¹ [Cyfieithu dogfennau HTW wedi'u cyhoeddi o'r Saesneg i'r Gymraeg](#)
Translation of published technical HTW documents from English into Welsh

Topic exploration report number	TER635
Topic	Spinal braces for mid-thoracic stable fractures
Summary of findings	Spinal bracing is standard of care for conservative management of stable spinal fractures, but there is uncertainty around what level of coverage is best when selecting a brace for a mid-thoracic fracture. We searched for evidence that may indicate which level of brace coverage is most effective for this type of fracture. Four systematic reviews and one economic analysis were identified. Systematic reviews concluded that the evidence around bracing for thoracolumbar fractures is of low quality and bracing does not offer additional benefits over other methods, including compared with no bracing. The economic analysis concluded using postoperative bracing after pedicle screw fixation for thoracolumbar burst fractures was not cost effective. There is a lack of high-quality evidence on spinal bracing for mid-thoracic fractures. It is also not certain whether all of the studies identified are directly applicable to this research question and there is a lack of evidence comparing different types of orthoses to each other.

Introduction and aims

Spinal braces are widely used for the non-surgical management of spinal fractures. A wide variety of braces are available, and these are often categorised by the areas of the spine they cover. For mid-thoracic fractures, the possible options (in increase amounts of coverage) are cervical thoracic orthoses (CTO), thoracolumbar sacral orthoses (TLSO), and cervical thoracic lumbar sacral orthoses (CTLSO). As spinal bracing is already standard of care for conservative management of stable spinal fractures, and there is uncertainty around what level of coverage is best when selecting a brace for a mid-thoracic fracture, stakeholders are interested in identifying evidence that may indicate which level of brace coverage is most effective for these fractures.

Health Technology Wales researchers searched for evidence on the clinical and cost effectiveness of various types of spinal orthoses for stable mid-thoracic fractures.

Evidence overview

Secondary evidence

We identified four relevant systematic reviews. Pieroh et al. (2023) assessed the use of spinal orthoses to treat osteoporotic thoracolumbar vertebral fractures in the elderly. They included 13 studies (five randomised controlled trials [RCTs], three non-randomised controlled trials, and five single-arm prospective studies) and eight systematic reviews. The review reported non-comparative studies found improvements in pain, function and quality of life with spinal orthoses. Studies comparing various orthoses to each other were reported to favour non-rigid orthoses, and studies comparing to not wearing an orthosis varied between finding no additional benefits to significant improvements with an orthosis. The authors noted previous systematic reviews recommended using spinal orthoses despite identifying low quality evidence. The studies included in this review were considered low quality and the authors concluded they could not make any recommendations on the use of spinal orthoses for osteoporotic thoracolumbar fractures.

Karimi and Fallahzadeh Abarghuei (2024) carried out a systematic review of the use of orthoses for thoracolumbar fractures more generally. Twenty studies were included (five RCTs, one prospective study, 11 retrospective studies, three cross-sectional studies) and were generally ranked as low quality using the Physiotherapy Evidence Database (PEDro) scale (scores ranged from 1 to 6 out of 10). The review authors concluded orthoses are not necessary for stable burst and compression fractures, as they 'do not provide any benefits'. However, it is not clear what this is in comparison to. The authors recommend using a brace for burst fractures involving more than one column.

Two older systematic reviews, including meta-analyses of RCTs, were identified. Wallace et al. (2019) included three RCTs (n = 119) comparing bracing versus no bracing for thoracolumbar burst fractures. They found no significant difference in any outcomes in the short or long term. Linhares et al. (2020) included five studies reported across eight articles (n = 267) investigating acute traumatic thoracolumbar fractures in skeletally mature patients treated with orthosis versus no orthosis. Meta-analyses found a statistically significant increase in mean admission time in the orthosis group of 3.47 days but found no difference in radiological or clinical outcomes between groups. Both of these reviews, therefore, concluded that bracing for thoracolumbar fractures offers no benefit over not bracing.

Economic evidence

One economic evaluation was identified. Piazza et al. (2017) assessed the cost effectiveness of postoperative bracing after pedicle screw fixation for thoracolumbar burst fractures. The

Evidence overview

authors pooled the results from 48 articles, including 1,957 patients, and also added patients from their institution's own registry for a total of 2,081 patients. Patients who were braced had statistically significantly lower rates of reoperation for non-union or clinically significant hardware failure than non-braced patients. There was no statistically significant difference in operative wound dehiscence or infection between the two groups. Utility scores were not significantly different between the braced and non-braced groups, and costs were also not significantly different when excluding the cost of the brace. Therefore, the additional cost of the brace led the authors to conclude that bracing postoperatively was not cost effective.

Areas of uncertainty

- The identified systematic reviews rate the quality of available evidence as low, with one stating it is not possible to make recommendations based on this evidence.
- There is a lack of evidence comparing differing orthoses that cover different areas of the spine, but evidence comparing bracing to no bracing suggests it adds no benefit.
- The identified economic analysis is not directly applicable as it is not comparing between orthosis types.

Literature search results

Evidence reviews and economic evaluations	
Karimi MT, Fallahzadeh Abarghuei A. (2024). Evaluating the efficacy of orthoses in the conservative treatment of thoracolumbar fractures: a systematic review. Med J Islam Repub Iran. 38: 62. doi: https://doi.org/10.47176/mjiri.38.62	
Linhares D, Pinto BS, Ribeiro da Silva M, et al. (2020). Orthosis in thoracolumbar fractures: a systematic review and meta-analysis of randomized controlled trials. Spine. 45(22). doi: https://doi.org/10.1097/BRS.0000000000003655	
Piazza M, Sinha S, Agarwal P, et al. (2017). Post-operative bracing after pedicle screw fixation for thoracolumbar burst fractures: A cost-effectiveness study. Journal of Clinical Neuroscience. 45: 33-9. doi: https://doi.org/10.1016/j.jocn.2017.07.038	
Pieroh P, Spiegl UJA, Völker A, et al. (2023). Spinal orthoses in the treatment of osteoporotic thoracolumbar vertebral fractures in the elderly: a systematic review with quantitative quality assessment. Global Spine J. 13(1_suppl): 59s-72s. doi: https://doi.org/10.1177/21925682221130048	
Wallace N, McHugh M, Patel R, et al. (2019). Effects of bracing on clinical and radiographic outcomes following thoracolumbar burst fractures in neurologically intact patients: a meta-analysis of randomized controlled trials. JBJS Reviews. 7(9). doi: https://doi.org/10.2106/JBJS.RVW.19.00006	

Date of search	22 December 2025
Concepts used	Spinal bracing, spinal orthosis, cervicothoracic orthosis, CTO, thoracolumbar sacral orthosis, TLSO, cervical thoracolumbar sacral orthosis, CTLSO, full spine orthosis, fracture, stable, mid-thoracic

Proposed research question and evidence selection criteria (if selected)

Proposed Research question	What is the clinical and cost effectiveness of different types of spinal orthoses for stable mid-thoracic fractures?
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	Inclusion criteria	Exclusion criteria
Population	People with stable mid-thoracic spinal fractures	
Intervention	Spinal bracing/orthoses: - cervicothoracic orthosis - thoracolumbar sacral orthosis - cervical thoracolumbar sacral orthosis	
Comparison/ Comparators	Comparison of the different types of orthoses to each other	
Outcome measures	Radiological changes Functional outcome measures Need for surgery Length of hospital stay Patient-reported pain Complications Health related QoL Resource use Economic outcomes	

Proposed speciality	Musculoskeletal system
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