



Topic Exploration Report ¹

Controlled dynamic stretch orthoses for postoperative knee stiffness and arthrofibrosis

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	TER629
Topic	Controlled dynamic stretch orthoses for postoperative knee stiffness and arthrofibrosis
Summary of findings	<p>Postoperative knee stiffness and arthrofibrosis are common complications following knee surgeries. Controlled dynamic stretch (CDS) orthoses are devices worn around the knee that apply a prolonged, dynamic stretch to the knee structures in order to stimulate growth of the contracted tissue and increase range of motion.</p> <p>Only one randomised controlled trial examining this technology was identified. The study was in German with an English summary and the intervention group, which received CDS orthoses, showed a greater knee extension deficit reduction than the control group. No other details were able to be extracted.</p> <p>There is an overall lack of evidence on clinical and cost effectiveness for this technology.</p>

Introduction and aims

Postoperative knee stiffness and arthrofibrosis are common complications following knee surgeries, including total knee arthroplasty (TKA) and anterior cruciate ligament reconstruction. There is currently a range of conservative and surgical options for this, such as physiotherapy and manipulation under anaesthesia (MUA). Surgical options carry risks if they are performed too late after the initial surgery.

Controlled dynamic stretch (CDS) orthoses are devices worn around the knee that contain an adjustable, spring-loaded hinge that apply a prolonged, dynamic stretch to the knee structures in order to stimulate growth of the contracted tissue and increase range of motion. The combination of stretch and active movement stimulates blood circulation in the contracted tissue in order to return it to a normal level of mobility. The Brace Orthopaedic CDS brace and the Albrecht CDS knee brace are examples of CE-marked CDS devices. It is proposed that CDS orthoses could reduce the need for surgical interventions, lead to shorter rehabilitation times, reduce the number of outpatient sessions required, and are suitable for home-based rehabilitation. This differs from static progressive stretching, which involves holding the joint in a position of stretch for a period of time, gradually increasing this stretch, and does not allow active movement.

Health Technology Wales researchers searched for evidence on the clinical and cost effectiveness of CDS orthoses for postoperative knee stiffness and arthrofibrosis.

Evidence overview

Guidance

NICE guideline 157 covers joint replacement for the knee, hip and shoulder (NICE 2020). Recommendations are made on postoperative care, however, CDS orthoses are not mentioned in the guidance.

Primary evidence

Only one randomised controlled trial was identified (Dalaker et al. 2015). The study is in German with an English summary. Seventy-two patients with knee extension deficit were randomised to either the CDS orthosis group or the control group. The CDS group had their deficit reduced by 6.52 ± 3.88 angular degrees compared to 3.47 ± 3.45 angular degrees in the control group. No further details were available in the abstract of this study.

Areas of uncertainty

There is currently a lack of both clinical and cost effectiveness evidence for CDS orthoses that would make a full appraisal feasible.

Literature search results

Health technology assessments and guidance

NICE. (2020). Joint replacement (primary): hip, knee and shoulder. NICE guideline NG157. National Institute for Health and Care Excellence. Available at: <https://www.nice.org.uk/guidance/ng157> [Accessed 07 October 2025].

Individual studies

Dalaker N, Waibel C, Schneider S. (2015). Wirkung einer neuartigen Orthese zur Behandlung von Patienten mit Extensionsdefizit im Kniegelenk - Eine randomisierte Anwendungsbeobachtung in einer Rehabilitationsklinik. Sports Orthopaedics and Traumatology Sport-Orthopädie - Sport-Traumatologie. 31(2): 123-9. doi: <https://doi.org/10.1016/j.orthtr.2015.03.040>

Date of search	07 October 2025
Concepts used	Controlled dynamic stretch, CDS, brace, orthosis, knee stiffness, total knee arthroplasty, arthrofibrosis

Proposed research question and evidence selection criteria (if selected)

Proposed Research question	What is the clinical and cost effectiveness of controlled dynamic stretch orthoses for postoperative knee stiffness and arthrofibrosis?
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	Inclusion criteria	Exclusion criteria
Population	Patients with knee stiffness or arthrofibrosis after knee surgery	
Intervention	Controlled dynamic stretch orthosis	
Comparison/ Comparators	<ul style="list-style-type: none"> • Physiotherapy- including manual therapy, therapeutic exercise, and range of motion protocols • Manipulation under anaesthesia 	
Outcome measures	Range of motion Number of physiotherapy sessions required Requirement for surgical intervention Patient acceptability Patient adherence Health related QoL Resource use Economic outcomes	

Proposed speciality	Musculoskeletal system
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