

Cost-Effectiveness Analysis and Clinical Trial Investigating the High-Intensity Stretch Device, the STAK Tool, in Knee Arthrofibrosis Patients.

Stennett R Oral Presentation at Scandinavian Sports Medicine Congress 2020

Introduction: Knee arthrofibrosis is a complication following a joint trauma which limits function and significantly impairs patient quality of life. Subsequent strain is placed on health care providers with regards to finance and staffing.

Objective: To compare the clinical- and cost-effectiveness of an at-home medical stretch device to the usual care (UC) provided by the National Health Service.

Materials and Methods: Clinical outcomes were knee range of motion, the Oxford Knee Score, Western Ontario and McMaster university score and the EuroQol-5 Dimension (EQ-5D) questionnaire. Patients who did not respond to prolonged physiotherapy were referred by orthopaedic consultants. The study utilised a block allocation design with patients either entering the Self-Treatment Assisted Knee (STAK) group (n=31) or a UC group (n=16). Incremental cost-effectiveness ratios (ICER) were calculated to demonstrate additional cost required to gain one Quality Adjusted Life Year (QALY).

Results: The STAK group demonstrated significant improvements from baseline to immediately post-treatment and to long-term follow-up (mean, 52 weeks), for all measures. The UC group demonstrated far smaller improvements and lost improvements at the long-term follow-up (mean, 45 weeks). The ICER for improvement in QALYs was 48.8 and the probability that the STAK tool was cost-effective 96% at a ceiling ratio of £1200 per QALY improvement.

Conclusions: The STAK tool demonstrates significant benefit to patient populations and demonstrates overwhelming cost-effectiveness following National Institute for health and Care Excellence guidelines.

Economic Evaluation summary and Implications

- Arthrofibrosis: Severely limits patient joint function and QoL AND puts a huge strain on the NHS due to it being a **lifelong** condition.

- **STAK Tool** - new, unique, self-directed High-Intensity Stretch device that can be used at home.
- **Results** - Significantly more effective than the current Usual Care. The STAK Tool improved knee joint flexion by 30.4° vs to 7.7° for Usual Care over an 8-week intervention and maintained after 12-months. Statistically and clinically significant improvements in knee ROM, function and patient QoL.
- **Cost Effectiveness** – would require an investment of £48.8/QALY, which is significantly below the £20,000/QALY NICE Guidelines threshold for consideration.

Future savings - cheaper than extensive physiotherapy and Manipulation Under Anaesthetic
When knee ROM <90° £4300 per MUA
- **Conclusion** - reduces cost of patient treatment, especially considering surgery and physiotherapy, and falls well within NICE price per QALY thresholds.

Further cost savings not captured by the Economic evaluation

- Manipulation Under Anaesthetic (MUA), surgery and extensive physiotherapy patients received prior to entering the study was not analysed as the aim was to compare 2 interventions over 8 weeks.
- 7 patients prior to commencing the Clinical Trial had undergone MUA (cost £4300 each) which failed ROM 65° (44-78).
- 5 of these patients went on to use the STAK achieving mean ROM 93° (62° - 110°).
- 4 of these patients had ROM well above the threshold for MUA (90°) a saving of £17,200

(4 x £4300).

Results and Cost-Effectiveness

The STAK Tool offers extremely positive results – **statistically and clinically significant** improvements of **30°**.

Also hugely improved patient QoL for a **small investment** of **£48.8/QALY** by health care providers.

- **SAVINGS**
- **The additional cost of using the STAK Tool would soon be surpassed by the Usual Care costs. UC is ineffective, causing prolonged and expensive treatment.**
- E.g. Manipulation Under Anaesthetic costs £4300 [10]. Patients with less than 90° flexion are considered for the procedure.
- Average STAK group ROM >90°, UC group <90°.
- Without STAK treatment there would be huge treatment costs per patient soon overtaking STAK investment cost

