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# *Reducing Stiffness After Knee Replacement:* *Development of an optimal physiotherapy intervention for arthrofibrosis following knee replacement.*

## BACKGROUND:

Arthrofibrosis following knee joint replacement is a pathological condition characterised by excessive scar tissue formation due to dysregulated inflammation[1]. It leads to severely restricted range of movement (ROM) that impedes function. Physiotherapy is the first-line treatment but there are no guidelines as to what this should include or how it should be delivered. Patients who do not improve often undergo manipulation under anesthetic (MUA) which can improve ROM but increases the risk for revision surgery[2].

The purpose of this study was to develop an optimal evidence- and theory-based intervention to improve outcomes for people with arthrofibrosis in line with MRC guidelines for intervention development[3].

## METHODS:

Four work-packages were undertaken:

1. ***Qualitative interviews*** to understand the impact of arthrofibrosis on patients and the challenges for therapists in delivering care.
2. ***Systematic review*** to evaluate the effectiveness of non-surgical interventions and examine content and delivery of interventions
3. ***Delphi survey*** to gain consensus on the most important items to include in an optimal intervention
4. ***Intervention workshop*** to refine a protocol for the content and delivery of the intervention

## RESULTS:

1. a) Patients told us of the devasting consequences of arthrofibrosis on their physical, mental and social wellbeing. They were frustrated by inconsistent messages and approaches from healthcare professionals. Manipulation under anesthetic (MUA) was sold as a last resort but the outcome was often unsatisfactory.

   b) Therapists reported several barriers to providing optimal care including knowledge gaps, a lack of clinical guidelines, system issues and perceived patient factors.

2. Evidence from 15 studies (n=321) showed that exercise, manual therapy device, and splinting can improve ROM. Interventions were poorly described (particularly exercise). There was a lack of patient-reported outcomes and longer follow-up including MUA and revision arthroplasty.

3. There was agreement that an optimal intervention should include consistent advice and education, tailored exercise and manual therapy. HCPs did not reach a consensus on the use of devices or splints but patients felt that they may be important to include.

## FINAL INTERVENTION:

The final intervention was developed in a series of workshops to increase acceptability and feasibility. The protocolised intervention promotes early identification and adopts a holistic approach to the patients with arthrofibrosis. It includes: a personalised exercise and manual therapy using a traffic light system to monitor response and progress rehabilitation.

# "Patients with arthrofibrosis after knee replacement need a tailored intervention that addresses their needs holistically"


# What Next?

## Feasibility testing of intervention for future RCT

Scan for copy of poster and references.

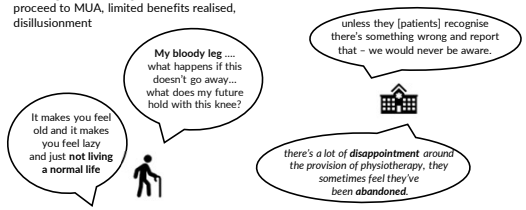
## *Themes from Qualitative Interviews*

14 Patients

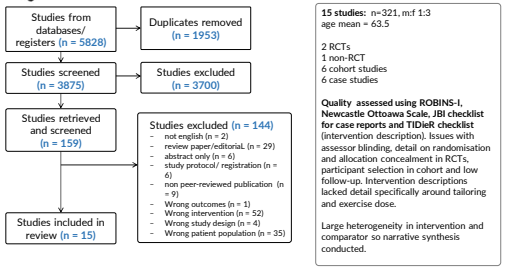
**Biopsychosocial impact-** significant functional limitation, impact on social and mental health, vulnerability
**Communicating with HCPs-** variable experiences, information availability and inconsistency, lacking [person-centred approach
**Sense making-** emotional labour in quest for understanding, frustration, resigned acceptance
**Commitment to exercise-** awareness and seeking alternative approaches
**"Nothing to lose"-** pragmatic decision to proceed to MUA, limited benefits realised, disillusionment

11 HCPs

**System issues-** Communication between staff; Accessibility to rehab; NHS pressures
**Difficulties in identifying "knee stiffness"-** Complex phenomenon; Gaps in knowledge;
**Perceived patient factors-** Patient engagement and adherence; Information needs; Lifestyle factors
**Treatment/intervention options and effectiveness-** Timing of intervention; Acknowledging shortcomings; Poor provision of effective analgesia




## *Summary of Systematic review*




**Interventions:**

Complex, multi-component.
Key components:
- Exercise
- Manual therapy
- Mechanical devices/splints
- Other adjuncts including information/education/ muscle stimulation.

**Assessed outcomes:**

- Range of movement (15)
- Function (5)
- MUA (3)
- Global rating of change (1)
- Adherence (2).

**Conclusions:**

1. Some available evidence that exercise, manual therapy device/splinting can improve ROM.
2. Quality of the evidence was low.
3. Poor descriptions of the interventions particularly tailoring of exercise components , details of information and guidance for participants was lacking.
4. Lack of patient-reported outcomes and longer follow-up including MUA and revision TKR.

## *Summary of Delphi Survey*

**Panel:** 26 Physiotherapists, 3 OTs, 2 Orthopaedic Surgeons, 8 patients

3-round online survey, consensus threshold 70%

**Round 1:** generated 96 components of items to be included in optimal intervention. Categorised into - Advice & Information, Exercise, Manual therapy, Mechanical devices/splints, Other aspects of care.

**Round 2:** participants rated each items on Likert scale. Not important >>> Very important Consensus for 33 items to be included (very important) and 1 rejected

**Round 3:** Items not reaching consensus for sent out for voting again. Further 6 items included and 2 rejected

| **Final consensus:** | **HCPs** | **Patients** |
|---|---|---|
| **Advice & Information** | 12 items | + 2 additional |
| **Exercise** | 10 items | + 7 additional |
| **Manual therapy** | 3 items | + 3 additional |
| **Mechanical devices and splinting** | 0 items | + 4 additional |
| **Additional components** | 14 items | + additional 11 |

Excluded items: Use of a foam roller, Instruments soft tissue release - ASYTM©, Delay focus on flexion in favour of extension , Kinesiotape, Use of compression bandage, TENS, NMES.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