

**Title:** Mid-term follow up and analysis of the subsequent need for hip replacement following completion of the CHAIN (Cycling against Hip Pain) programme.

**Abstract:**

**Purpose:**

The CHAIN (Cycling against Hip Pain) programme is a six-week exercise and education treatment pathway for people diagnosed with hip osteoarthritis. It is designed to promote the self-management of hip pain based on the National Institute for Health and Care Excellence (NICE) guidelines that recommend education and advice, exercise (aerobic and local muscle strengthening) and weight loss where appropriate. It is a conservative treatment option designed to help patients avoid the need for, or to delay the need for hip replacement surgery.

Participants attend a local leisure centre for a thirty minute education session, delivered by a physiotherapist, followed by thirty minutes of indoor cycling led by a spin instructor. The sessions are progressive and supplemented with home exercises. Education topics include: the benefits of exercise for osteoarthritis, diet and nutrition, pain relief, pacing of activities and lifestyle change.

The short-term clinical results of the intervention have previously been published, with patients reporting improvements to pain and function; having an increased confidence in self-managing hip pain, and having increased motivation to exercise. However, a mid-term analysis on the subsequent need for hip replacement patients has not been completed.

Therefore, this follow-up analysis aimed to interrogate patient hospital records to establish the number of CHAIN participants that had returned to their local hospital for treatment of hip osteoarthritis with hip replacement surgery.

**Methods:**

One hundred and nineteen participants were enrolled onto the first CHAIN programme between October 2013 and February 2015. Of the 96 participants who completed the programme (Table 1), 95 patient records could be found on their local NHS Trust computer system in November 2018. These records were systematically reviewed, with any theatre admissions, orthopaedic outpatient appointments or radiology reports opened for investigation. Patients who had returned to their local NHS hospital for total hip replacement were recorded.

**Results:** Of the 95 records interrogated, 32 patients (33.7%) had returned to their local NHS hospital for total hip replacement surgery. At up to five year follow up (range: 3 to 5 years) thirty one patients received unilateral total hip replacement and one patient received bilateral total hip replacement. Sixty three patients (66.3%) did not return to their local hospital for surgical intervention. Of the hip replacements that were performed following

conservative treatment through the CHAIN programme, six were in 2014, eleven were in 2015, six were in 2015, five were in 2017 and five were in 2018.

**Conclusions:** Following conservative treatment of osteoarthritis through a cycling and education programme, 66.3% of participants had not returned for a hip replacement surgical intervention at the local NHS hospital from the region in which they were referred. This may have significant economic implications for practice, given the high cost of surgical interventions and the increasing numbers of people with osteoarthritis.

**Table 1: Characteristics of completed CHAIN participants (n =96)**

<b>Gender n (%)</b>	Male	44 (46%)
	Female	52 (54%)
<b>Primary Diagnosis n (%)</b>	No diagnosis	10 (10%)
	Osteoarthritis	75 (78%)
	Rheumatoid Arthritis	1 (1%)
	Post Traumatic	1 (1%)
	Other	6 (6%)
	Not stated	3 (3%)
<b>BMI n (%)</b>	Under 25.0	24 (25%)
	25.0 – 29.9	33 (34%)
	30.0 and over	24 (25%)
	Not stated	15 (16%)
<b>Age mean(SD)</b>		62.23 (9.27)
<b>Baseline Oxford Hip Score mean (SD)</b>		33.07 (8.18)