

# No need for outpatient physiotherapy following total knee arthroplasty

## A randomized trial of 120 patients

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**Background** We have not found any reports on the effect of physiotherapy after knee replacement.

**Patients and methods** In a prospective randomized controlled trial, we randomized two groups to receive or not receive outpatient physiotherapy following total knee arthroplasty. 120 patients were recruited over 2 years, each followed up for 1 year. Inclusion criteria were age between 55–90 years, less than 40 degrees of fixed flexion contracture and the ability to walk at least 10 meters unaided preoperatively with monoarticular arthrosis.

**Results** We found no statistically significant benefit of outpatient physiotherapy at any of the three times measured. After adjusting for baseline differences between the two treatment groups, the mean difference in knee flexion 1 year postoperatively was only 2.9 degrees. This mean difference is of no clinical significance.

**Interpretation** We concluded that in a preselected group of patients following primary total knee arthroplasty, inpatient physiotherapy with good instructions and a well-structured home exercise regime can dispense with the need for outpatient physiotherapy. ■

We have not found any papers on the benefits of outpatient physiotherapy following total knee arthroplasty (TKA). Even continuous passive motion (CPM) and manipulations following TKA have at best shown no difference (Fox and Poss 1981, Romness and Rand 1988, Johnson 1990, Daluga et al. 1991, Pope et al. 1997, Esler et al. 1999).

Therefore, we set out to determine whether or not outpatient physiotherapy gives any benefits in the short, medium and long-term. We tried to predict which subgroup of patients would not require outpatient physiotherapy following TKA. We hypothesized that most patients after TKA would need only inpatient physiotherapy, good instructions about their new total knee arthroplasty and a well-structured home exercise regime.

### Patients and methods

The target population consisted of patients who required a TKA and were admitted for this procedure in Lincoln County Hospital. The study was carried out prospectively. It was approved by our Medical Ethics Committee and all patients gave their written consent.

All patients with monoarticular arthrosis between the ages of 55–90 years who had less than 40 degrees of fixed flexion contracture, walked at least 10 meters unaided and had undergone a primary TKA were included. Patients with a concurrent hip or ankle problem were excluded.

They were then randomized, using a random number table, into one of two groups, namely, those who had inpatient physiotherapy and outpatient physiotherapy, and those who had received inpatient physiotherapy only. All patients were given a home exercise regime to follow on discharge.

Outpatient physiotherapy is usually given, on average, 4–6 times after discharge from hospital.

Table 1. Demographics

	Outpatient PT <sup>a</sup> (n = 56)	No outpatient PT (n = 60)
Male / female	20 / 36	23 / 37
Mean age (SD)	69 (9.3)	68 (10)
Mean preoperative ROM (degrees) (SD)	98 (13)	96 (9.0)

<sup>a</sup> PT physiotherapy

The patients were then seen at 3 months, 6 months and 1 year to record the range of motion of their knees. A blinded observer was employed to reduce inter-observer error.

To detect a clinically significant difference of 10 degrees (estimating a within-group standard deviation of 12 degrees) at 95% power and with a 5% significance level, a sample size of 39 patients in each arm of the experiment was required. Patients were recruited over a 24-month period between January 1998 and December 1999. Sufficient numbers were entered into the trial to allow for drop-outs.

120 patients were recruited. We had 59 patients in the outpatient physiotherapy group. One patient had no outpatient physiotherapy, one transferred to a different area and one had an infection requiring a revision total knee arthroplasty. This left 56 patients in this arm of the study (36 women). In the group that did not receive outpatient physiotherapy, there were initially 61 patients. However, one of them died leaving 60 for analysis (37 women).

The analysis was carried out on an intention to treat basis. Analysis of covariance (ANCOVA) was

used to compare the range of knee motion between the two treatment groups at 3 months, 6 months and 1 year. Baseline measurements (taken as the range of knee motion at discharge) was fitted as a covariate in each model, to adjust for any baseline differences between the two groups. All analyses were done using the software package STATA 7.

## Results

Patients in the two groups were similar in their baseline characteristics for age and gender (Table 1). The outpatient physiotherapy group had a slightly higher mean range of movement pre-operatively and at discharge. This was adjusted for in the analysis by including the range of movement at discharge as a covariate. We found no statistically significant difference in the range of movement between the two groups at any of the three examinations (Table 2).

The largest difference occurred at 6 months, when the adjusted mean difference between treatment groups was 2.82 (95% CI: -0.19, 5.83,  $p = 0.07$ ). Although no significant differences were found at each examination, the outpatient physiotherapy group performed slightly better, even after adjusting for baseline differences. However, differences between the two groups were small and of no clinical significance.

## Discussion

We found no clinically important difference in the

Table 2. Range of motion in degrees

	Outpatient PT <sup>a</sup> (n = 56) mean (SD)	No outpat. PT (n = 60) mean (SD)	Adjusted mean difference <sup>b</sup> (95%CI)	P-value
At discharge				
(baseline)	92 (7.7)	90 (4.5)		
3 months	95 (8.5)	92 (8.2)	2.3 (-0.59 to 5.2)	0.1
6 months	97 (9.0)	93 (7.9)	2.8 (-0.19 to 5.8)	0.07
1 year	98 (8.1)	96 (7.1)	2.2 (-0.47 to 5.0)	0.1

<sup>a</sup> PT physiotherapy  
<sup>b</sup> Adjusted for baseline measurements using ANCOVA

ultimate range of movement following total knee arthroplasty with or without outpatient physiotherapy. Laubenthal et al. (1972) showed that 90 degrees of flexion was sufficient for most activities of daily living. The mean range of flexion of our patients in both groups was 92 degrees. Hence the few degrees more gained with outpatient physiotherapy would not have affected their activities of daily living.

The gains of not having to undergo outpatient physiotherapy are considerable. First, there is the inconvenience to the patient since many have to rely on the use of hospital transport which may take several hours for a short trip as patients are collected from various parts of the county.

There is also the effect on the outpatient physiotherapy resources and waiting list. Since total knee arthroplasty patients can be shown to fare just as well with a well-structured home exercise regime, which dispenses with the need for outpatient physiotherapy, the limited resources can be directed to areas of greater need.

Lastly, there is the effect on costs. Savings can be made on the hospital transport system, which can then be streamlined. There are also costs that

directly affect the physiotherapy department and the allocation of staff for more effective use.

No competing interests declared.

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