

# Effect of GoKnee intervention on knee range of motion, pain, and functional mobility post total knee arthroplasty (TKA).

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## Introduction

The prevalence of total knee arthroplasties (TKA) is rapidly increasing. The procedure is projected to reach 3.48 million per year by 2030.<sup>1</sup> There is currently no standardized treatment approach post-surgery, nor is there one treatment which research has shown to be significantly better than others.

- The GoKnee device was created to provide an affordable treatment option post-TKA that helps patients achieve a faster recovery of function
- The device is lightweight, hand-made tool that utilizes moveable pads.
- Goals of the GoKnee include: increase knee range of motion, increase strength of the quadriceps and hamstrings, and improve functional mobility.
- While the GoKnee's clinical utilization is increasing, research has yet to be conducted on the device and its effectiveness.

## Purpose

To determine if the GoKnee device is able to significantly improve objective and functional outcomes in TKA rehabilitation. To answer the question "Does using the GoKnee device impact a patient's ROM, pain, and functional mobility post – TKA compared to traditional interventions?"

## Methods

### Participants:

- 29 subjects
- All subjects had undergone recent TKA's
- All subjects were receiving PT services at skilled nursing facilities or through home health



Figure 1: Flexion

Figure 2: Extension and Strengthening

**Instrumentation:** The GoKnee device was utilized in all physical therapy sessions. A long arm goniometer was used to perform all flexion and extension measurements.

### Protocol/Procedure:

- Divided into three phases:
  - Flexion (Figure 1)
  - Extension (Figure 2)
  - Strengthening (Figure 2).
- Flexion and extension protocols include obtaining subject's end ROM and holding for 2 minutes
  - These phases end with 5 rounds of alternating push/pull motions, each held for 20 seconds.
- Strengthening protocol includes performing isometric extension holds for 5 seconds/ 10 second rest for a total of 2 minutes
- Measurements were taken at initial evaluation and periodically throughout the treatment course.

## Data Analysis

- Scores were categorized into the following groups: 2 – 6 days post-op, 7 – 11 days post-op, 12 – 16 days post-op, and 17+ days post-op.
- SPSS Statistics software was used to calculate and perform paired samples t – tests for the provided data within these time frames.

## Results

- Mean values for each dependent variable over all time periods are shown in Table 1.
- Significant differences were found in all variables from 2-6 days post-op to 7-11 days post-op. (Table 2)
- Pain (P = 0.008) and flexion (P = 0.001) variables showed a significant difference from 7-11 days post-op to 12-16 days post-op.
- No significant differences were found for extension, TUG, gait speed or sit to stand from 7-11 days post-op. vs 12-16 days post-op.
- No significant differences were found in any variable from 12-16 to 17+ days post-op.
- Statistically significant improvements were made within individuals in functional and objective outcome measures after using the GoKnee device following a TKA.

## Discussion

As demonstrated in Table 2, all variables saw significant improvements throughout the rehabilitation treatment. Improvements were most significant in the early phases of rehab.

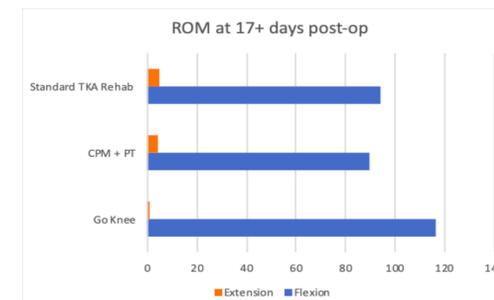


Figure 3

A review of relevant literature has shown that the GoKnee has the potential to demonstrate stronger improvements in ROM and gait speed, but mixed results in terms of TUG scores, as compared to traditional rehabilitation protocols.

Table 1: Mean Values For Each DV Over Time Periods

Variable	PO Days 2-6	PO Days 7-11	PO Days 12-16	PO Days 17+
Pain	5.5925	3.8233	3.2081	1.7267
Flexion (deg)	89.28	102.31	108.23	116.23
Extension* (deg)	-3.45	0.15	-0.10	0.77
TUG (sec)	53.00	23.9612	17.60	13.45
Gait Speed (m/s)	0.3773	0.6385	0.7700	0.80536
Sit to Stand (reps)	2.36	7.08	7.87	9.91

\*negative indicates degrees lacking from full extension

Table 2: Progression Over Time

	2-6 vs 7-11	7-11 vs 12-16	12-16 vs 17+
Pain	0.000*	0.008*	0.119
Flexion	0.000*	0.001*	0.012
Extension	0.001*	1.00	
TUG	0.000*	0.106	0.017
Gait Speed	0.000*	0.020	0.095
Sit to Stand	0.001*	0.555	0.028

\*significance (p<.008 per Bonferroni correction)

Figure 3 demonstrates a comparison to ROM findings found by Lesseen et. al at 17 days post operative in TKA patients. Despite these positive findings, additional research needs to be conducted to further confirm these findings.<sup>2</sup>

### Limitations:

- Small sample size (n = 29)
- Retrospective study
- Potential bias of the data provided
- No patient demographics were given
- Limited comparison data
- Missing data

## Acknowledgements

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## References

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