

# Functional recovery in staged bilateral total knee arthroplasty

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# Staged total knee arthroplasty (TKA)

The difference in outcomes between the first and contralateral knee is unknown

The optimal interval between TKA on the functional recovery is unknown

# Purpose

To compare knee function and patient-reported outcomes between first- and second-operated knees

To evaluate the effect of the time between surgeries on the recovery of the second TKA

# Materials and methods

56 patients who underwent staged primary TKA due to osteoarthritis were included

## Patient demographics

Age	74.2 years old (7.7)
Height	151.5 cm (8.6)
Weight	61.5 kg (12.4)
Interval between TKA	14.9 months (14.9)

# Evaluation

Muscle strength (knee extension, flexion)

Timed up and go (TUG) test

10 m walking time

Knee Society score (KSS)

New Knee Society score (2011 KSS)

# Interval

Early	< 6 months
Intermediate	6-12 months
Late	> 12 months

# Results

## Preoperative comparison between 1st- and 2nd-surgery

	First	Second	p-value
Knee extension strength (Nm/kg)	0.876 (0.345)	0.925 (0.428)	0.135
Knee flexion strength (Nm/kg)	0.527 (0.259)	0.532 (0.189)	0.891
Time up and go test (seconds)	14.5 (11.5)	12.3 (10.3)	0.003
10 m walking time (seconds)	12.6 (9.5)	10.9 (7.3)	0.030
Knee extension angle (degrees)	-9.3 (8.1)	-7.8 (8.1)	0.115
Knee flexion angle (degrees)	114.7 (25.2)	117.8 (16.1)	0.371
KSS knee score	40.8 (22.5)	47.4 (19.8)	0.010
KSS function score	46.4 (26.7)	54.8 (28.6)	0.121
2011 KSS symptoms	5.8 (4.7)	8.5 (5.4)	<0.001
2011 KSS satisfaction	11.9 (5.2)	14.1 (6.5)	0.014
2011 KSS expectation	12.7 (3.3)	12.8 (3.1)	0.691
2011 KSS functional activities	32.7 (19.8)	41.4 (17.9)	<0.001
Hip-knee-ankle angle (degrees)	11.6 varus (7.5)	9.5 varus (10.0)	0.045
All values were shown in average (standard deviation). KSS: Knee Society score			

## Postoperative comparison between 1st- and 2nd-surgery

[illegible]



## Comparison in improvement between 1st- and 2nd-surgery

[illegible]

# Results

## Preoperative comparison of second knees

	Early (n = 17)	Intermediate (n = 20)	Late (n = 19)	p-value
Knee extension strength (Nm/kg)	0.995 (0.562)	0.962 (0.326)	0.829 (0.394)	0.492
Knee flexion strength (Nm/kg)	0.612 (0.223)	0.497 (0.199)	0.511 (0.144)	0.259
Time up and go test (seconds)	15.2 (18.2)	11.6 (4.1)	10.6 (3.6)	0.419
10 m walking time (seconds)	12.5 (11.3)	10.1 (3.5)	10.4 (5.6)	0.601
Knee extension angle (degrees)	-8.0 (7.7)	-8.2 (8.5)	-7.4 (8.4)	0.954
Knee flexion angle (degrees)	113.7 (15.8)	119.2 (16.2)	119.7 (16.5)	0.502
KSS knee score	44.8 (24.0)	47.3 (20.2)	50.0 (15.9)	0.751
KSS function score	54.7 (30.5)	54.0 (31.2)	53.8 (22.5)	0.981
2011 KSS symptoms	7.9 (5.2)	9.1 (6.4)	8.6 (4.6)	0.815
2011 KSS satisfaction	14.2 (6.6)	13.3 (6.2)	15.0 (6.8)	0.725
2011 KSS expectation	12.5 (3.9)	12.8 (3.4)	13.2 (2.0)	0.840
2011 KSS functional activities	40.9 (23.4)	40.0 (18.1)	43.4 (11.3)	0.837
All values were shown in average (standard deviation). KSS: Knee Society score				

# Results

## Comparison in improvement of second knees

	Early (n = 17)	Intermediate (n = 20)	Late (n = 19)	p-value
Knee extension strength (Nm/kg)	0.121 (SD = 0.548)	0.267 (SD = 0.658)	0.477 (SD = 0.531)	0.180
Knee flexion strength (Nm/kg)	0.207 (SD = 0.206)	0.220 (SD = 0.192)	0.139 (SD = 0.246)	0.488
Time up and go test (seconds)	0.4 (SD = 8.5)	3.9 (SD = 7.1)	2.5 (SD = 4.5)	0.310
10 m walking time (seconds)	3.7 (SD = 11.6)	1.8 (SD = 4.9)	2.8 (SD = 7.1)	0.772
Knee extension angle (degrees)	4.4 (SD = 8.8)	5.8 (SD = 8.2)	4.5 (SD = 8.8)	0.862
Knee flexion angle (degrees)	3.3 (SD = 19.2)	2.9 (SD = 21.8)	-1.6 (SD = 21.4)	0.740
KSS knee score	48.4 (SD = 26.3)	43.0 (SD = 22.2)	45.9 (SD = 20.9)	0.773
KSS function score	22.1 (SD = 42.3)	33.8 (SD = 35.9)	31.3 (SD = 36.1)	0.627
2011 KSS symptoms	11.4 (SD = 8.7)	11.3 (SD = 9.0)	11.5 (SD = 7.0)	0.995
2011 KSS satisfaction	9.8 (SD = 9.1)	14.6 (SD = 10.4)	14.3 (SD = 11.5)	0.307
2011 KSS expectation	-2.8 (SD = 4.9)	-3.6 (SD = 3.9)	-1.9 (SD = 4.7)	0.520
2011 KSS functional activities	18.9 (SD = 34.7)	29.9 (SD = 30.6)	25.1 (SD = 29.0)	0.577
All values were shown in average (standard deviation). KSS: Knee Society score				

# Conclusion

- 1 In the first-operated knees, greater improvement in ambulatory function was measured due to lower preoperative conditions, compared to the opposite knee.
- 2 The time between surgeries seems not to affect the rate of recovery of the second knee.

# References

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