

Is Manipulation Under Anesthesia Effective In Improving Patient Reported Outcomes After Total Knee Arthroplasty? A Matched Cohort Analysis



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Background
Manipulation under anesthesia (MUA) after total knee arthroplasty (TKA) is considered effective for postoperative stiffness, but strong scientific justification is lacking.
This study compared outcomes in two matched cohorts: patients who met criteria and underwent MUA and patients who met criteria but did not undergo MUA.

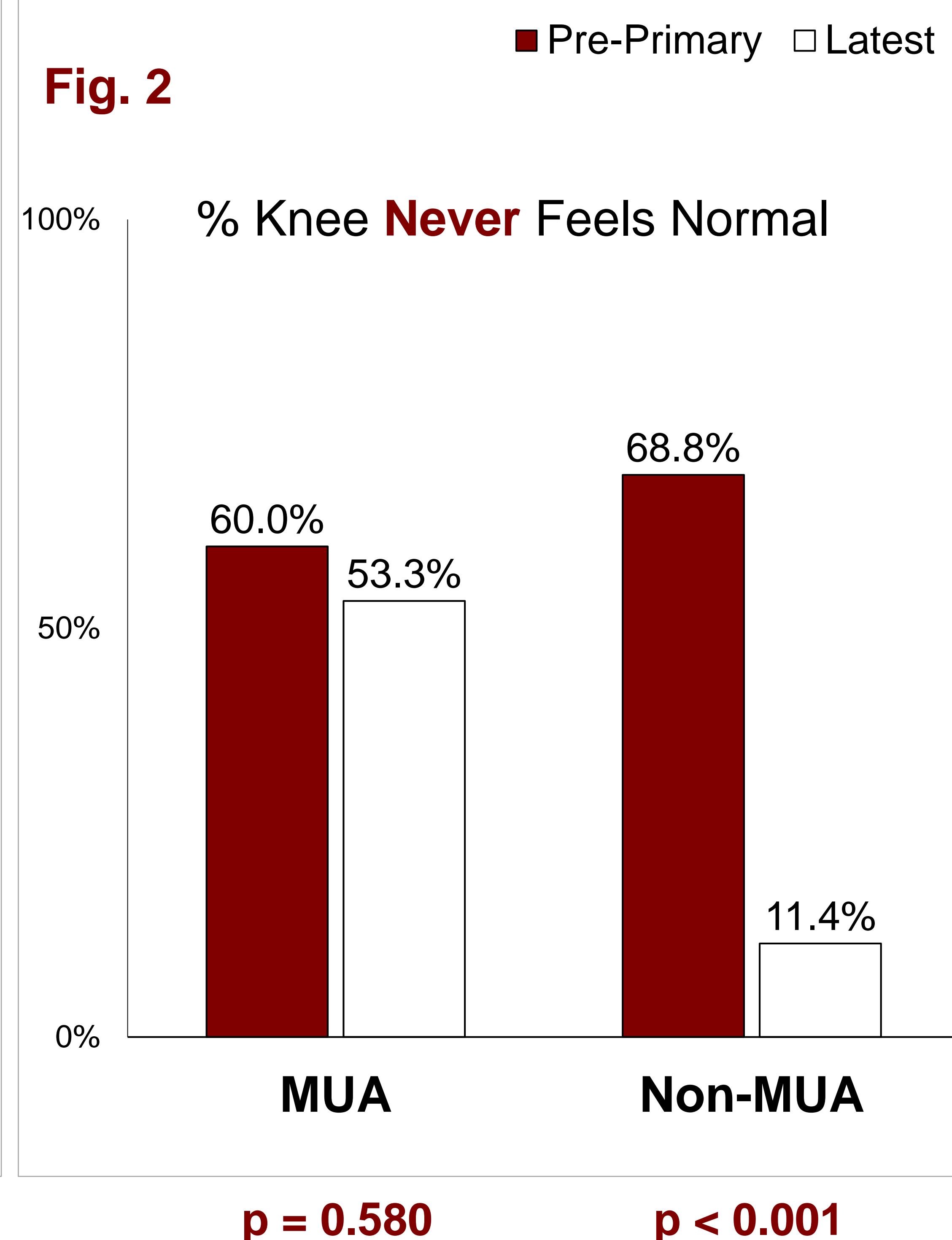
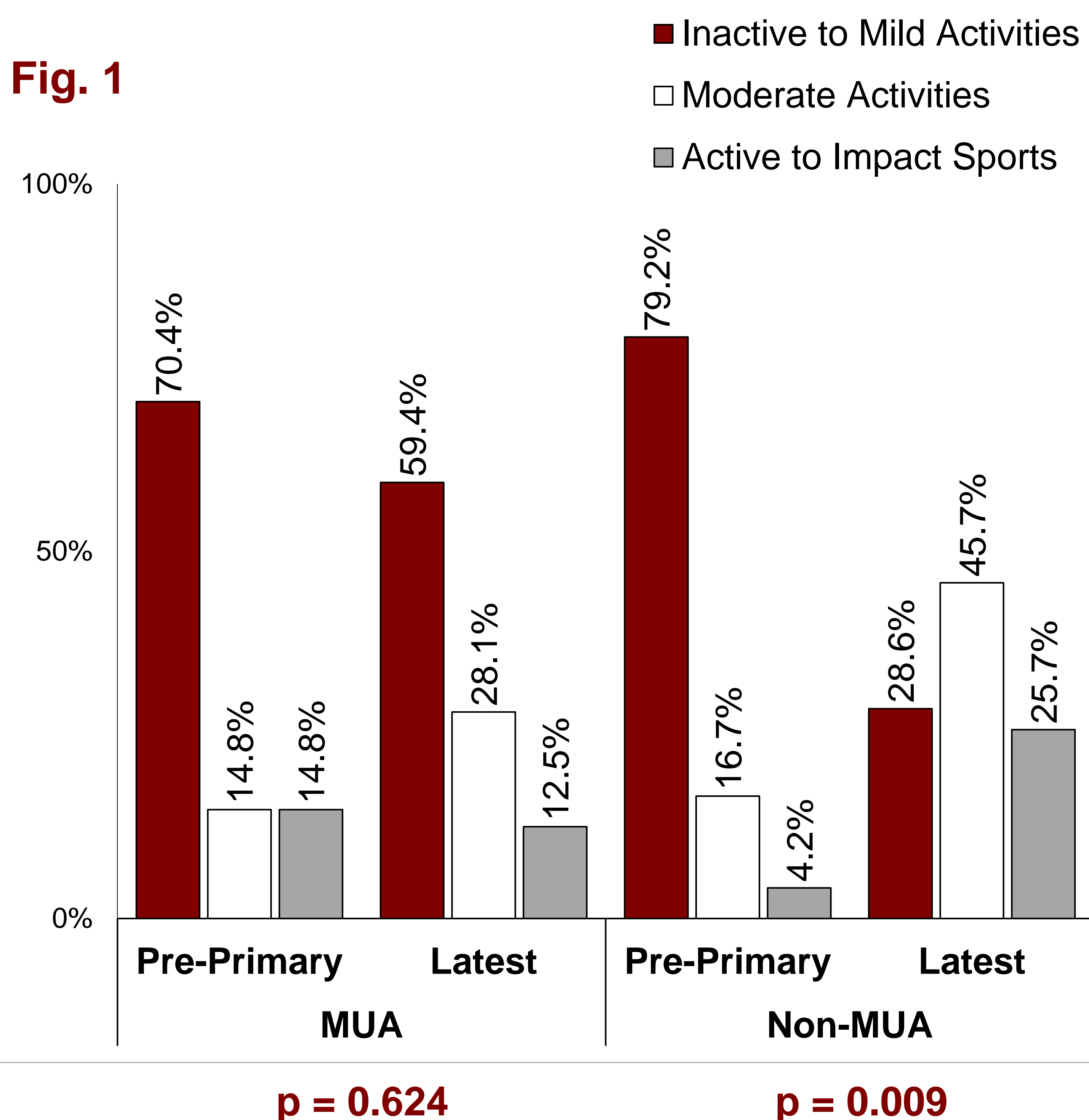
Methods

- 42 MUAs were retrospectively reviewed. Six MUAs were excluded for potential confounds.
- 36 MUA cases were matched one-to-one on sex ($p=1.000$), age ($p=0.893$), race ($p=0.938$), BMI ($p=0.069$), and implant manufacturer ($p=1.00$) to 36 non-MUA cases.
- MUA cases had $\leq 90^\circ$ flexion 4-weeks postoperatively and underwent MUA surgery within 12 weeks of the index TKA.
- Non-MUA cases had $\leq 90^\circ$ flexion 4-weeks postoperatively and did not undergo MUA. This control group was treated with aggressive flexion exercises, frequent follow-up, and pain control modalities per surgeon discretion.
- Outcome variables included amount of improvement in flexion from preoperative baseline to latest follow-up and standardized PROMS. Covariates potentially affecting outcomes were taken into account.

Results

- Overall MUA incidence during the time period (2011-2017) was 1.9%. MUA and non-MUA groups did not differ on preoperative fibromyalgia, depression, and narcotic use; or intraoperative analgesia ($p \geq 0.084$). Four non-MUA patients and no MUA patients had inflammatory disease ($p=0.054$), and six of the former compared to none of the latter had lumbar spine pain or disease ($p=0.025$).
- Table 1** – mean pre-primary TKA flexion was significantly greater in the MUA cohort (112.4° vs. 98.6° , $p=0.002$). On average, between pre-primary TKA and latest follow-up, MUA patients lost 10.7° of flexion compared to a gain of 12.7° by non-MUA patients ($p < 0.001$).
- Pre-primary TKA to latest follow-up improvement in pain walking on level ground (-3.3 vs. -4.7 , $p=0.190$) and climbing stairs (-3.7 vs. -5.1 , $p=0.192$) did not significantly differ between MUA and non-MUA groups; respectively.
- Fig. 1** – prior to primary TKA, both groups had similar activity levels ($p=0.624$). At latest follow-up, non-MUA patients were significantly more active than MUA patients ($p=0.009$).
- Fig. 2** – prior to primary TKA, the proportion of patients in each group who reported their knee never feels normal was similar ($p=0.580$) but at latest follow-up, significantly less non-MUA patients reported their knee never feels normal (11.4% vs. 53.3% , $p < 0.001$).
- At latest follow-up, 88.6% of non-MUA patients and only 50% of MUA patients were satisfied or very satisfied with their knee surgery ($p=0.001$).**

Conclusion
Patients with $\leq 90^\circ$ flexion 4-weeks after TKA who underwent MUA had significantly worse flexion and PROM scores than matched control patients who did not undergo MUA.
These findings question the effectiveness of MUA as a legitimate treatment for postoperative TKA stiffness.



	MUA	Non-MUA	p
Mean (SD) Pre-Primary TKA Flexion (degrees)	112.4 (14.5)	98.6 (20.3)	0.002
Mean (SD) 4-Week Post Primary Flexion (degrees)	74.1 (15.5)	85.5 (6.5)	< 0.001
Mean (SD) Days Between Primary TKA and 4-Week Follow-up	28.4 (2.2)	28.4 (2.1)	0.886
Mean (SD) Latest Postoperative Follow-Up Flexion (degrees)	102.8 (20.6)	111.3 (14.3)	0.051
Mean (SD) Days Between Primary TKA and Latest Follow-up	375 (360)	616 (414)	0.012
Mean Change in Pre-Primary to Latest Follow-Up Flexion (degrees)	-10.7 (20.6)	12.7 (17.7)	< 0.001