



CAMPBELL
UNIVERSITY

Physical Therapy

TRACEY F. SMITH HALL OF NURSING & HEALTH SCIENCES

Effectiveness of Total Range Exerciser in Total Knee Arthroplasty Rehabilitation: A Randomized Clinical Trial

Final Results – December 11, 2019

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- Normality of Data
- Baseline differences between groups
- Repeated Measures MANOVA
 - Difference in outcomes by Time, Group, and Time x Group
 - Statistical significance – p values
 - Effect size – partial eta squared
- Clinical meaningfulness of outcomes
 - Minimal Detectable Change

- Original sample size = 44 (adjusted to 51 due to withdrawals)
- Approached = 70
- Consented = 51
- Withdrew = 9 post-op pre intervention (SC = 8); 2 no surgery

Results – Participants

	Total Sample N = 40	SC N = 17 Mean (SD)	T-Rex N = 23 Mean (SD)
Gender	55% Female	52.9% Female	56.5% Female
Age	55.68 (10.92)	55.91 (7.49)	55.50 (13.06)
BMI	33.71 (4.84)	33.49 (4.92)	33.87 (4.89)

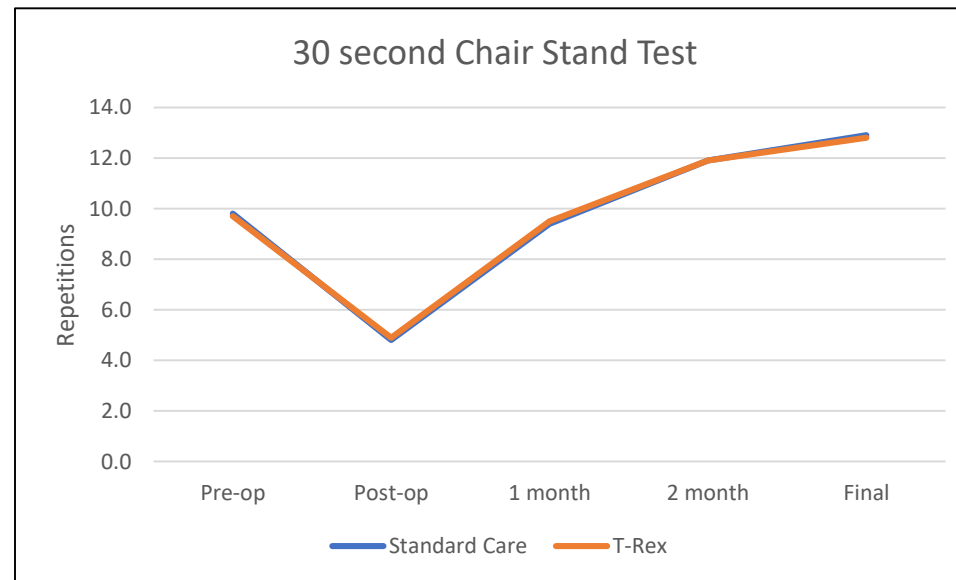
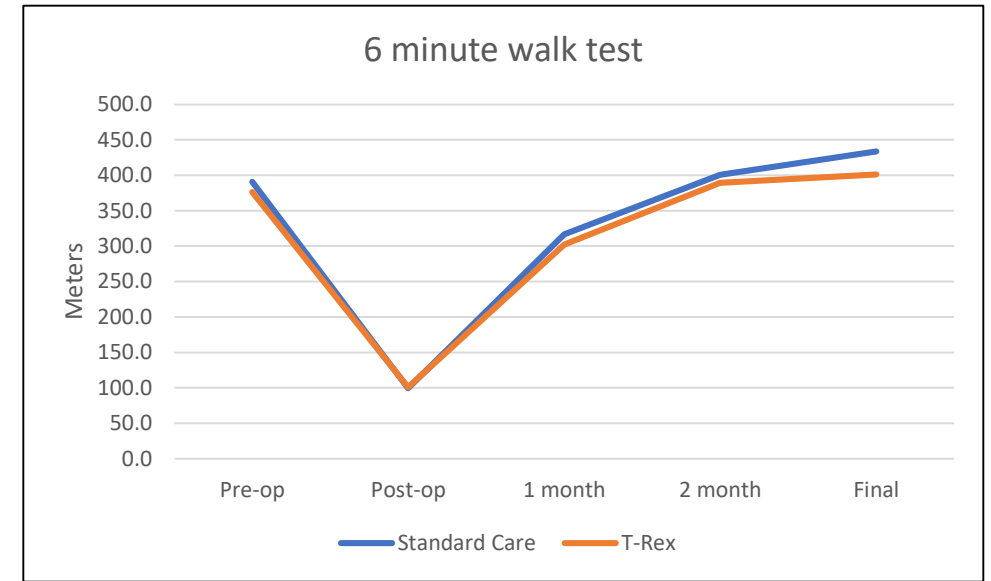
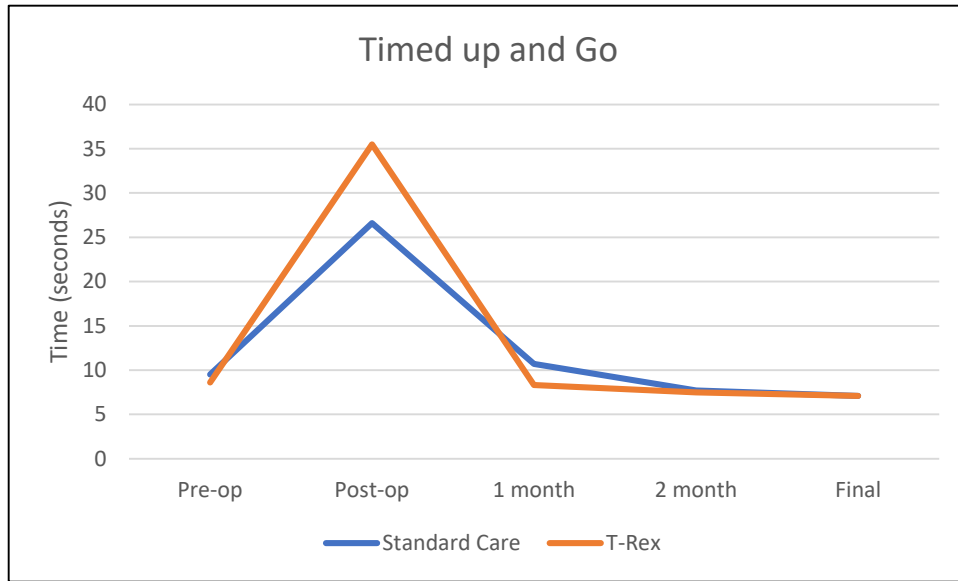
SC = Standard Care; T-Rex = Total Range Exerciser; BMI = Body Mass Index

Results – Baseline

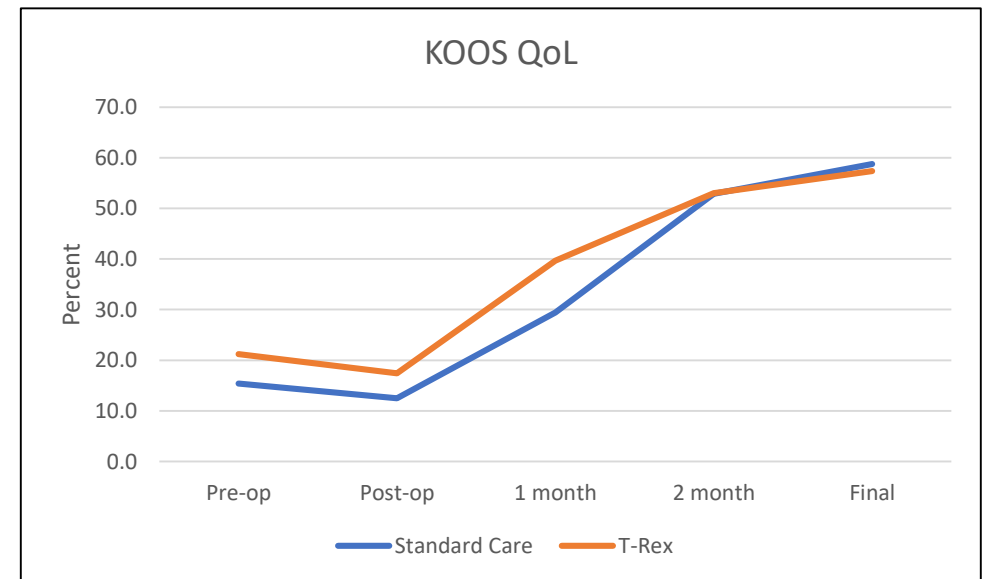
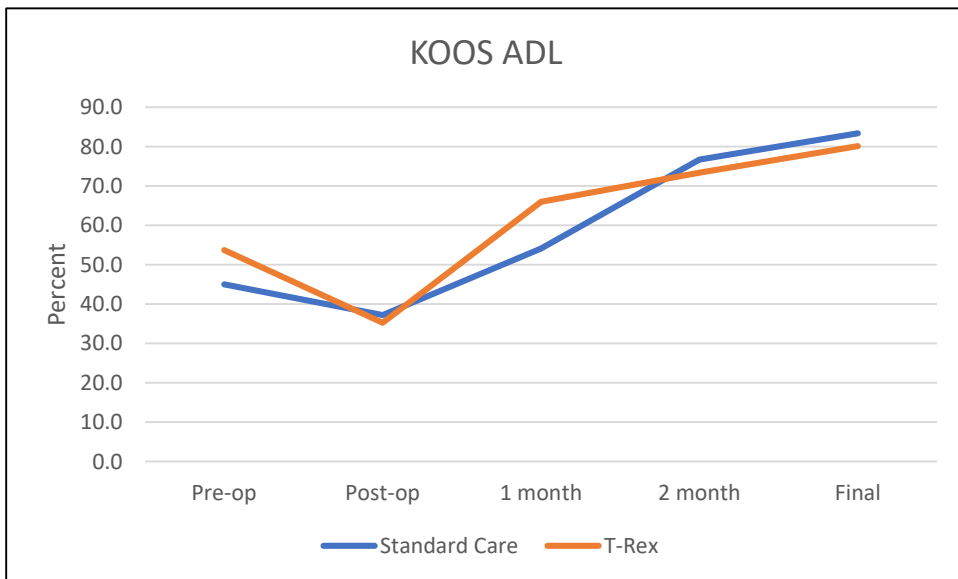
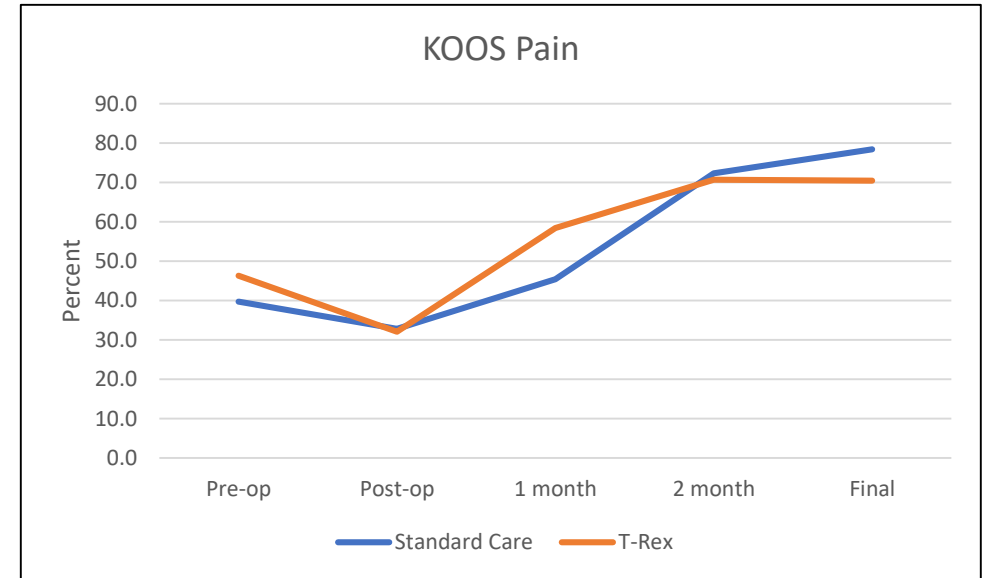
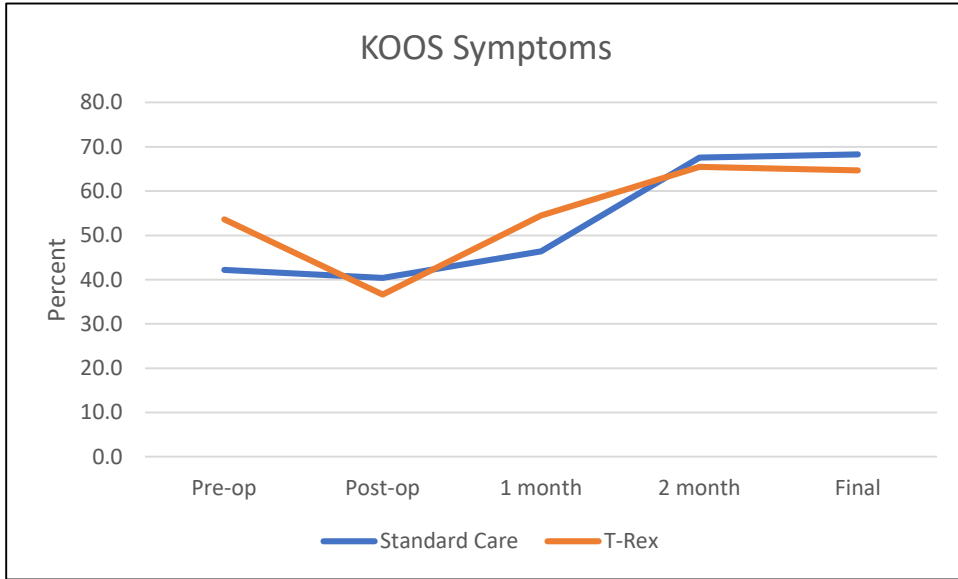
	SC N = 17 Mean (SD)	T-Rex N = 23 Mean (SD)	P value Independent Sample T-Test	Interpretation
TUG	9.46 (4.1)	8.52 (3.12)	.414	No difference
6MWT	390.7 (99.5)	376.36 (92.7)	.643	No difference
30sCST	9.8 (4.6)	9.7 (3.0)	.983	No difference
KOOS Symptoms	42.2 (14.4)	53.6 (15.85)	.025	Statistical Difference
KOOS Pain	39.7 (18.0)	46.3 (13.6)	.197	No difference
KOOS ADL	44.0 (17.6)	53.7 (17.5)	.130	No difference
KOOS QoL	15.4 (13.6)	21.2 (13.9)	.201	No difference

SD = Standard Deviation; TUG = Timed-up-and-go test; 6MWT = 6 minute walk test; 30sCST = 30 second Chair Stand test; KOOS = Knee Injury and Osteoarthritis Outcome Scale; ADL= Activities of Daily Living; QoL = Quality of Life; SC = Standard Care; T-Rex = Total Range Exerciser

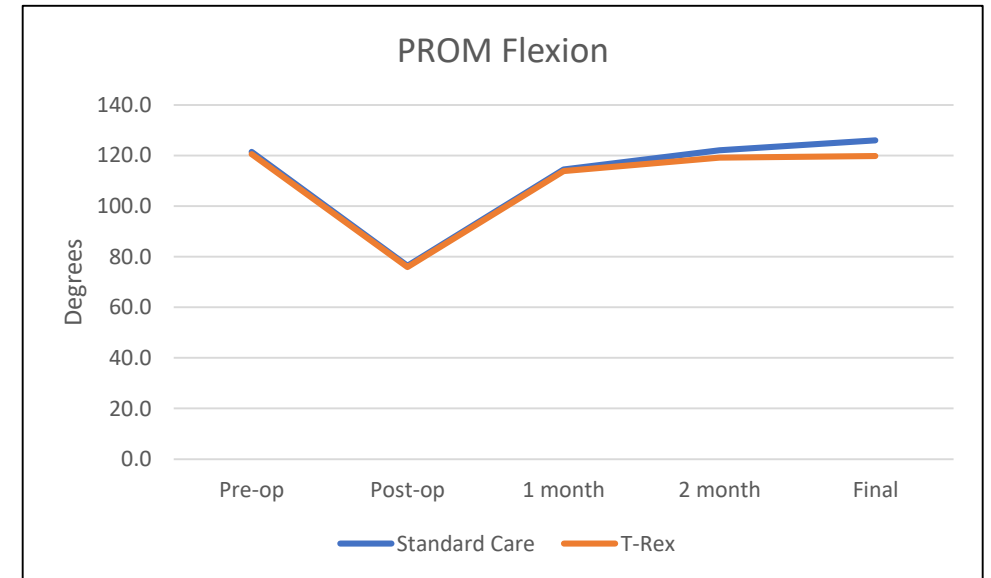
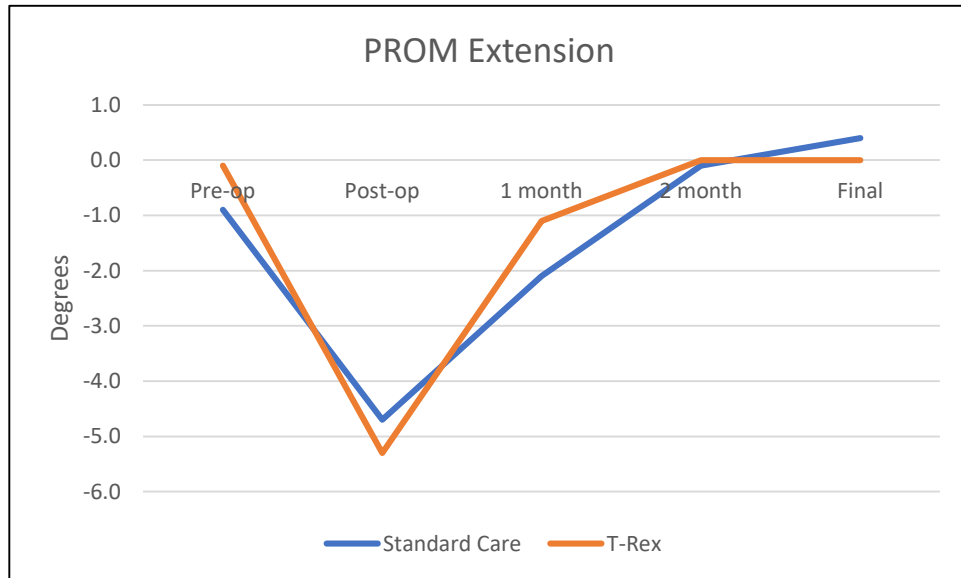
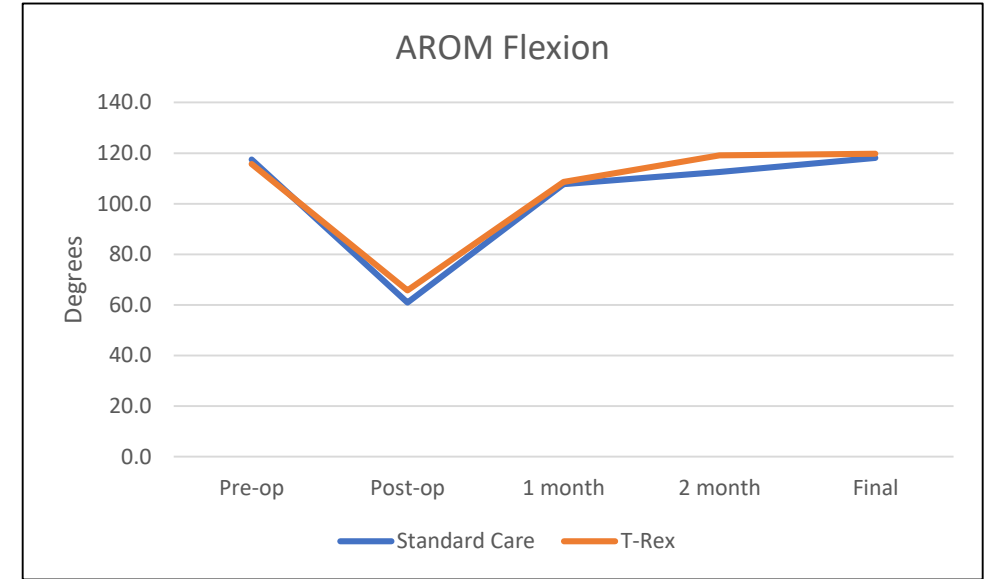
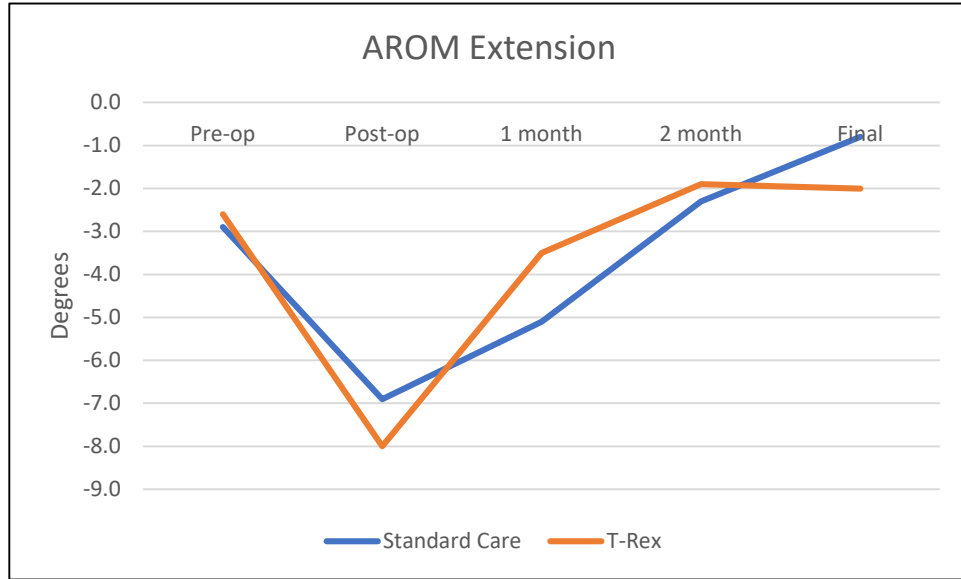
Results – Functional Measures



Results – KOOS



Results – Range of Motion



Results – Minimal Detectable Change

	MDC	SC Y/N - Time	T-Rex Y/N - Time	Favors SC or T-Rex
TUG	2	Y – Final	No	SC
6MWT	61.34	No	No	=
30sCST	3	Y - Final	Y – Final	=
KOOS Symptoms	8	Y – 2 month	Y – 2 month	=
KOOS Pain	8	Y – 2 month	Y – 1 month	T-Rex
KOOS ADL	8	Y – 1 month	Y – 1 month	=
KOOS QoL	8	Y – 1 month	Y – 1 month	=

MDC = Minimal Detectable Change; SD = Standard Deviation; TUG = Timed-up-and-go test; 6MWT = 6 minute walk test; 30sCST = 30 second Chair Stand test; KOOS = Knee Injury and Osteoarthritis Outcome Scale; ADL= Activities of Daily Living; QoL = Quality of Life; SC = Standard Care; T-Rex = Total Range Exerciser

Results – Effect Size

	Partial Eta Squared Total	Partial Eta Squared SC Group	Partial Eta Squared T-Rex Group	Interpretation
TUG	.293	.297	.355	Large effect
6MWT	.093	.178	.050	Small to medium effect
30sCST	.343	.260	.461	Large effect
KOOS Symptoms	.383	.690	.188	Large effect
KOOS Pain	.704	.746	.735	Large effect
KOOS ADL	.748	.767	.786	Large effect
KOOS QoL	.755	.760	.763	Large effect

MDC = Minimal Detectable Change; SD = Standard Deviation; TUG = Timed-up-and-go test; 6MWT = 6 minute walk test; 30sCST = 30 second Chair Stand test; KOOS = Knee Injury and Osteoarthritis Outcome Scale; ADL= Activities of Daily Living; QoL = Quality of Life; SC = Standard Care; T-Rex = Total Range Exerciser

Results – Effect Size

	Partial Eta Squared Total	Partial Eta Squared SC Group	Partial Eta Squared T-Rex Group	Interpretation
AROM – Flexion	.016	.003	.024	No effect
AROM – Extension	.054	.223	.010	No effect
PROM – Flexion	.003	.174	.000	No effect
PROM Extension	.017	.089	.001	No effect

Active Range of Motion (AROM); Passive Range of Motion (PROM); Standard Care Group (SC); Total Range Exerciser Group (T-Rex)

- At baseline groups were not different
- Statistics
 - No difference by group OR group x time
 - Difference in time
- Effect size
 - Large effect sizes for all KOOS subscales
 - Large effect sizes for most functional measures (TUG & 30sCST)
 - Small to moderate effect size for 6MWT
 - No effect for AROM or PROM
- Minimal Detectable Change
 - TUG – only SC group achieved MDC
 - 6MWT – neither group achieved MDC
 - 30sCST – both groups achieved MDC at Final
 - KOOS subscales – both groups achieved change at all subscales (T-Rex favored at 1 month for Pain)