

Supplementary Materials

Table 1.S. Comparison of patient characteristics between those included (BMI data available) vs. excluded (no BMI data available) in the analysis[‡]

	Included (N=7714)	Excluded(N=5650)	P-Value
Age (yrs)	65.5±1.1	66.5±1.1	0.34
Sex			
Female N (%)	4732(61.1)	3016(58.8)	0.51
Male N (%)	3016(38.9)	2330(41.2)	0.51
# of Comorbidities			
0	6141(79.3)	4457(78.9)	0.92
1	1439(18.6)	1046(18.5)	0.96
2	163(2.1)	141(2.5)	0.56
3	5(0.1)	5(0.1)	0.44

[‡]Continuous variables are presented as the mean and the standard error of mean. Categorical variables are presented as the number, with the percentage in parentheses.

Table 2.S. Adjusted mean comparison between those included (BMI data available) vs. excluded (no BMI data available) cohorts for Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) subscales and EuroQol-5D (EQ5D) [‡]

Outcomes	Time	Included cohort (With BMI records)		Excluded cohort (Without BMI records)		SEM	P-Value
		N	Mean	N	Mean		
Total Score							
	Pre	7714	55.6	5650	54.8	0.53	0.13
	Post 3 months	3846	26.3	2302	25.7	0.73	0.35
	Post 12 months	1663	25.3	1074	23.2	1.45	0.10
Pain							
	Pre	7714	54.6	5650	53.6	0.56	0.10
	Post 3 months	3846	23.9	2302	23.2	0.70	0.15
	Post 12 months	1663	24.6	1074	21.6	1.49	0.06
Function							
	Pre	7714	56.0	5650	55.2	0.55	0.16
	Post 3 months	3846	28.0	2302	28.1	0.75	0.84
	Post 12 months	1663	26.0	1074	22.6	1.41	0.07
Stiffness							
	Pre	7714	55.0	5650	54.3	0.61	0.26
	Post 3 months	3846	33.5	2302	32.2	0.85	0.10
	Post 12 months	1663	24.2	1074	22.5	1.53	0.27
EQ5D							
	Pre	3848	0.45	2763	0.47	0.009	0.04
	Post 3 months	1579	0.76	1274	0.75	0.009	0.69
	Post 12 months	534	0.68	435	0.67	0.02	0.75

[‡] Adjusted means and standard error of mean differences were calculated from linear mixed model adjusted for age, sex, number of comorbidities, and zone of service.

Table 3.S. Least square means of pain, physical function, stiffness, and total score at preoperative and 3- and 12- months following surgery for different body mass index groups

Outcomes	Baseline Mean (95% C.I)	3 months Mean (95% C.I)	12 months Mean (95% C.I)
Total Score†			
Normal	54.9(50.8, 59.0)	28.9(24.5, 33.3)	26.0(20.9, 31.1)
Overweight	55.4(51.5, 59.3)	27.9(23.9, 31.9)	24.3(20.2, 28.5)
Obese I	56.7(52.8, 60.5)	28.2(24.2, 32.1)	24.8(20.7, 28.9)
Obese II	56.9(52.9, 61.6)	28.0(23.9, 32.0)	25.6(21.3, 29.9)
Obese III	57.6(53.7, 61.6)	28.7(24.6, 32.8)	26.6(22.2, 31.1)
Pain†			
Normal	54.1(49.8, 58.5)	29.6(25.0, 34.2)	24.4(19.1, 29.7)
Overweight	54.9(50.8, 59.1)	28.4(24.2, 32.6)	22.3(17.9, 26.7)
Obese I	55.8(51.7, 59.9)	28.2(24.0, 32.4)	23.0(18.7, 27.4)
Obese II	55.3(51.1, 59.5)	26.4(22.1, 30.7)	23.4(18.8, 28.0)
Obese III	56.2(52.0, 60.4)	26.8(22.5, 31.1)	23.2(18.6, 27.9)
Function†			
Normal	55.0(50.7, 59.3)	28.0(23.5, 32.5)	26.1(21.0, 31.2)
Overweight	55.5(51.4, 59.3)	26.7(22.6, 30.8)	24.5(20.2, 28.7)
Obese I	56.9(52.8, 60.9)	27.1(23.0, 31.2)	25.0(20.8, 29.2)
Obese II	57.3(53.3, 61.4)	27.2(23.0, 31.4)	26.0(21.6, 30.5)
Obese III	58.2(54.1, 62.3)	28.0(23.8, 32.2)	27.1(22.6, 31.7)
Stiffness†			
Normal	57.0(52.4, 61.6)	37.1(32.2, 42.0)	29.6(23.8, 35.3)
Overweight	56.7(52.4, 61.1)	34.9(30.5, 39.3)	28.1(23.5, 32.8)
Obese I	57.5(53.2, 61.8)	35.2(30.8, 39.7)	27.7(23.1, 32.8)
Obese II	57.5(53.1, 61.9)	33.8(29.2, 38.3)	29.4(24.5, 34.2)
Obese III	57.2(52.8, 61.6)	34.3(29.8, 38.9)	28.9(23.9, 33.8)
EQ5DΨ			
Normal	0.46(0.37, 0.55)	0.69(0.6, 0.79)	0.69(0.58, 0.80)
Overweight	0.44(0.35, 0.53)	0.70(0.61, 0.79)	0.70(0.61, 0.80)
Obese I	0.45(0.36, 0.54)	0.70(0.61, 0.79)	0.71(0.62, 0.81)
Obese II	0.42(0.33, 0.51)	0.70(0.61, 0.80)	0.70(0.60, 0.80)
Obese III	0.41(0.32, 0.50)	0.71(0.62, 0.80)	0.72(0.62, 0.82)

† Scale of 0 to 100, with 100 being the worst. Ψ1.00 indicating full health and 0 representing death.

Table 4.S. Regression coefficient (standard error) of model parameters for different dependent variables

Model parameters	Dependent variable			
	Total score	Pain β (SE)	Stiffness β (SE)	Function β (SE)
(Intercept)	60.5(1.9)	69.1(2.0)	74.2(2.1)	56.4(1.9)
Length of surgery	-0.006	-0.075	-0.005	-0.003
BMI groups				
BMI2 (Overweight)	0.5(0.9)	0.8(1.0)	-0.2(1.0)	0.5(0.9)
BMI3 (Obese Class I)	1.7(0.9)	1.7(0.9)	0.5(1.0)	1.9(0.9)
BMI4 (Obese Class II)	2.0(0.9)	1.1(1.0)	0.5(1.1)	2.4(1.0)
BMI5 (Obese Class III)	2.7(1.0)	2.0(1.0)	0.2(1.1)	3.2(1.0)
Time				
Time2 (post 3 months)	-26.0(1.2)	-24.6(1.3)	-19.9(1.4)	-27.0(1.2)
Time3 (post12months)	-28.9(1.8)	-29.8(1.8)	-27.4(2.1)	-28.9(1.8)
Sex				
Male	-3.0(0.4)	-3.4(0.4)	-4.3(0.4)	-2.6(0.4)
Age	-0.1(0.0)	-0.2(0.0)	-0.3(0.0)	-0.1(0.0)
Zone of Service				
Central	1.2(0.5)	2.3(0.6)	1.5(0.6)	1.0(0.6)
Edmonton	2.4(0.4)	2.2(0.4)	2.3(0.5)	2.6(0.4)
# of Comorbidities				
1	2.7(0.5)	2.7(0.5)	1.3(0.5)	3.1(0.5)
2	6.9(1.3)	7.3(1.4)	4.3(1.5)	7.0(1.4)
3	2.7(7.7)	0.8(8.1)	-1.8(8.6)	3.8(7.9)
Time \times BMI groups				
BMI 2: Time 2	-1.5(1.3)	-2.0(1.4)	-1.9(1.6)	-1.8(1.4)
BMI 3: Time 2	-2.5(1.3)	-3.0(1.4)	-2.4(1.6)	-2.7(1.4)
BMI 4: Time 2	-2.9(1.4)	-4.4(1.5)	-3.8(1.7)	-3.1(1.4)
BMI 5: Time 2	-3.0(1.4)	-4.8(1.6)	-3.0(1.7)	-3.2(1.5)
BMI 2: Time 3	-2.1(2.0)	-2.8(2.1)	-1.2(2.3)	-2.1(2.0)
BMI 3: Time 3	-2.9(2.0)	-3.0(2.0)	-2.4(2.3)	-3.0(2.0)
BMI 4: Time 3	-2.4(2.1)	-2.1(2.2)	-0.7(2.4)	-2.4(2.1)
BMI 5: Time 3	-2.1(2.1)	-3.1(2.2)	-0.9(2.5)	-2.2(2.1)

BMI:1 (Normal), Time: 1 (pre), Sex: Female, Zone: South, Comorbidities: Zero, and interaction of BMI 1by Time 1 were reference groups in multiple linear mixed effect models

Results generated using raw data with range of 0-96 for total score, 0-68 for physical function, 0-20 for pain, and 0-8 for stiffness)

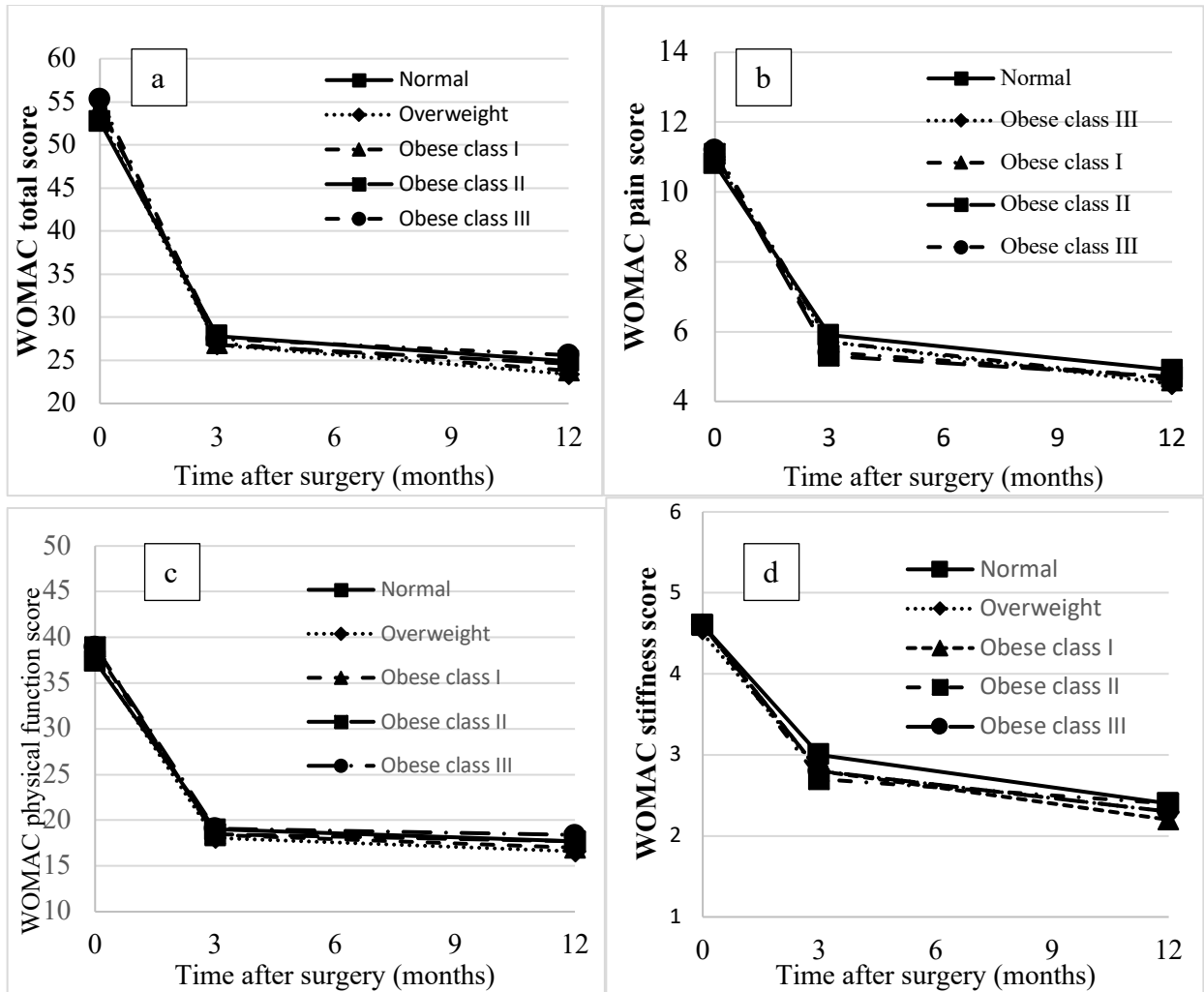


Figure 1.S. Adjusted mean for WOMAC total score (a), pain (b), physical function (c), and stiffness (d) by BMI group and time (baseline [preoperative] and 3, and 12 months post TKA). Each line represents a BMI group normal weight (solid square; BMI ≤ 24.99 kg/m² BMI of < 25 kg/m²), overweight (dashed diamond; $25 \leq \text{BMI} \leq 29.99$ kg/m²), class-I obese (dashed triangle; $30 \leq \text{BMI} \leq 34.99$ kg/m²), class-II obese (dashed square; $35 \leq \text{BMI} \leq 39.99$ kg/m²), and class-III obese (solid circle; BMI ≥ 40 kg/m²). Adjusted means were computed from a linear mixed effects model adjusting for age, sex, number of comorbidities, and zone of service. Least square mean values, which are used to generate the graphs are provided in the Supplement as Table 5.S.

Table 5.S. Least square mean of Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) subscales using raw data at preoperative, 3- and 12-month postoperative

Outcomes	Pre	3-month	12-month
	Mean (95% C.I)	Mean (95% C.I)	Mean (95% C.I)
Total Score (scale 0-96)			
Normal	52.7(56.7,40.3)	27.8(32.0,22.1)	24.9(29.8,21.2)
Overweight	53.2(56.9,40.5)	26.8(30.6,20.9)	23.4(27.4,19.5)
Obese I	54.4(58.1,41.4)	27.0(30.8,21.2)	23.8(27.8,19.9)
Obese II	54.6(58.4,41.8)	26.8(30.7,21.3)	24.6(28.7,20.7)
Obese III	55.3(59.1,42.4)	27.5(31.4,21.9)	25.6(2.2,21.5)
Pain (scale 0-20)			
Normal	10.8(10,11.7)	5.9(5,6.9)	4.9(3.8,5.9)
Overweight	11.0(10.2,11.8)	5.7(4.8,6.5)	4.5(3.6,5.4)
Obese I	11.2(10.3,12)	5.7(4.8,6.5)	4.6(3.7,5.5)
Obese II	11.1(10.2,11.9)	5.3(4.4,6.1)	4.7(3.8,5.6)
Obese III	11.2(10.4,12.1)	5.4(4.5,6.2)	4.7(3.7,5.6)
Function (scale 0-68)			
Normal	37.4(34.5,40.3)	19.0(16.0,22.1)	17.7(14.3,21.2)
Overweight	37.7(35,40.5)	18.1(15.3,20.9)	16.6(13.7,19.5)
Obese I	38.7(35.9,41.4)	18.4(15.7,21.2)	17.0(14.1,19.9)
Obese II	39(36.2,41.8)	18.5(15.7,21.3)	17.7(14.7,20.7)
Obese III	39.6(36.8,42.4)	19.1(16.2,21.9)	18.4(15.4,21.5)
Stiffness (scale 0-8)			
Normal	4.6(4.2,4.9)	3.0(2.6,3.4)	2.4(1.9,2.8)
Overweight	4.5(4.2,4.9)	2.8(2.4,3.2)	2.3(1.9,2.6)
Obese I	4.6(4.3,5.0)	2.8(2.5,3.2)	2.2(1.9,2.6)
Obese II	4.6(4.3,5.0)	2.7(2.3,3.1)	2.4(2.0,2.7)
Obese III	4.6(4.2,4.9)	2.8(2.4,3.1)	2.3(1.9,2.7)

Table 6.S. Mean Changes by BMI Group: Results from Mixed Effect Model Using raw data

Outcomes	Pre to 3 M	3 to 12 months	Pre to 12 months
	Mean change (95% C.I)	Mean change (95% C.I)	Mean change (95% C.I)
Total Score (scale 0-96)			
Normal	-25.0(-27.2, -22.7)	-2.8(-6.4, -0.8)	-27.8(-31.1, -24.4)
Overweight	-26.4(-27.6, -25.3)	-3.4(-5.2, -1.6)	-29.8(-31.5, -28.2)
Obese I	-27.4(-28.5, -26.2)	-3.2(-4.9, -1.5)	-31.0(-32.7, -29.3)
Obese II	-27.8(-29.2, -26.3)	-2.3(-4.5, -0.1)	-30.1(-32.1, -28.0)
Obese III	-27.8(-29.3, -26.3)	-2.0(-4.3, 0.4)	-29.8(-32.0, -27.5)
			Mean improvement = -29.7
Pain (scale 0-20)			
Normal	-4.9(-5.4, -4.4)	-1.0(-1.8, -0.3)	-6.0(-6.7, -5.2)
Overweight	-5.3(-5.6, -5.0)	-1.2(-1.6, -0.8)	-6.5(-6.9, -6.2)
Obese I	-5.5(-5.8, -5.3)	-1.0(-1.4, -0.7)	-6.7(-7.1, -6.3)
Obese II	-5.8(-6.1, -5.5)	-0.6(-1.1, -0.1)	-6.4(-6.8, -5.9)
Obese III	-5.9(-6.2, -5.5)	-0.7(-1.2, -0.2)	-6.6(-7.1, -6.1)
			Mean improvement = -6.4
Function (scale 0-68)			
Normal	-18.3(-20.0, -16.7)	-1.3(-3.8, 1.2)	-19.6(-22.0, -17.3)
Overweight	-19.6(-20.4, -18.8)	-1.5(-2.7, -0.3)	-21.1(-22.3, -19.9)
Obese I	-20.2(-21.0, -19.4)	-1.4(-2.7, -0.2)	-22.0(-23.3, -20.8)
Obese II	-20.5(-21.5, -19.5)	-0.8(-2.4, 0.7)	-21.3(-22.7, -19.8)
Obese III	-20.5(-21.6, -19.4)	-0.6(-2.3, 1.1)	-21.1(-22.7, -19.5)
			Mean improvement = -21.0
Stiffness (scale 0-8)			
Normal	-1.6(-1.8, -1.4)	-0.6(-0.9, -0.3)	-2.2(-2.5, -1.9)
Overweight	-1.7(-1.9, -1.6)	-0.5(-0.7, -0.4)	-2.3(-2.4, -2.1)
Obese I	-1.8(-1.9, -1.7)	-0.6(-0.8, -0.4)	-2.3(-2.5, -2.2)
Obese II	-1.9(-2.0, -1.8)	-0.4(-0.6, -0.1)	-2.2(-2.4, -2.1)
Obese III	-1.8(-2.0, -1.7)	-0.4(-0.7, -0.2)	-2.3(-2.5, -2.1)
			Mean improvement = -2.3
‡Significant mean changes are bolded. Negative mean changes for WOMAC scores (total, pain, function, and stiffness) indicate improvement.			