



## Supplementary Material

10.1302/2633-1462.28.BJO-2021-0075.R1

**Table i.** Missing data: number and proportions of patients with complete data by treatment arm.

Complete at	ESP (N = 99)	MUA (N = 201)	ACR (N = 203)
<b>Complete – health-related quality of life</b>			
Baseline	95 (95.96%)	199 (99.00%)	200 (98.52%)
3 months	88 (88.89%)	173 (86.07%)	175 (86.21%)
6 months	75 (75.76%)	172 (85.57%)	165 (81.28%)
12 months	86 (86.87%)	178 (88.56%)	175 (86.21%)
Overall	64 (64.65%)	156 (77.61%)	149 (73.40%)
<b>Complete – costs</b>			
3 months	78 (78.79%)	164 (81.59%)	158 (77.83%)
6 months	71 (71.72%)	155 (77.11%)	150 (73.89%)
12 months	77 (77.78%)	161 (80.10%)	158 (77.83%)
Overall	55 (55.56%)	123 (61.19%)	121 (59.61%)
<b>Complete – both health-related quality of life and costs</b>			
3 months	76 (76.77%)	161 (80.10%)	154 (75.86%)
6 months	68 (68.69%)	152 (75.62%)	144 (70.94%)
12 months	75 (75.76%)	159 (79.10%)	157 (77.34%)
Overall	46 (46.46%)	117 (58.21%)	116 (57.14%)

**Table ii.** Missing data: description of economic variables in UK FROST.

Variable		Missing values (%)				Range	Mean	SD
		Total	ESP	MUA	ACR			
<b>Baseline</b>								
Age, yrs	Age at trial entry	0	0	0	0	30 to 70	54.25	7.72
Sex	Male or female	0	0	0	0	1,2	63% female	
eq5d_B	EQ-5D-5L at baseline	1.79	4.04	0.99	1.48	-0.37 to 1.00	0.43	0.26
OSS_B	OSS score at baseline	0.40	0	0.50	0.49	1 to 48	19.89	8.25
Diabetes	Diabetic yes/no at baseline	0	0	0	0	1,3	70% no Diabetes	
Alloc	Treatment allocation	0	0	0	0	1,3		
<b>Outcome variables for health-related quality of life</b>								
eq5d_3m	EQ-5D-5L at 3 months	13.32	11.1	13.9	13.8	-0.245 to 1.00	0.60	0.26
eq5d_6m	EQ-5D-5L at 6 months	18.09	24.2	14.4	18.7	-0.257 to 1.00	0.70	0.23
eq5d_12m	EQ-5D-5L at 12 months	12.72	13.1	11.4	13.8	-0.328 to 1.00	0.73	0.26
<b>Outcome variables for costs</b>								
Cost_ESP	Costs of ESP <sup>^</sup>	0	0	0	0	59.8 to 768.4	279.46	148.8
Cost_MUA	Costs of MUA <sup>^</sup>	0	0	0	0	259.2 to 972.0	424.81	115.5
Cost_ACR	Costs of ACR <sup>^</sup>	0	0	0	0	877.3 to 3,082.3	2,170.46	431.1
Cost_PPP	Costs of physiotherapy <sup>~</sup>	0	0	0	0	0 to 975.2	209.65	152.9
Cost_add	Additional treatments <sup>a</sup>	0	0	0	0	0 to 167.97	2.83	21.0
Cost_further	Further treatments <sup>b</sup>	0	0	0	0	0 to 1,521.87	41.41	204.2
Cost_other	Other treatments <sup>c</sup>	0	0	0	0	0 to 668	7.18	49.42
Cost_crossovers	Treat. after crossover <sup>d</sup>	0	0	0	0	0 to 125.01	0.50	7.87
Cost_Hosp_INP	Inp costs re complications <sup>e</sup>	0	0	0	0	0 to 4,926.24	32.85	312.1
Cost_Hosp_OUP	Out costs re complications <sup>f</sup>	0	0	0	0	0 to 875.07	19.37	82.71
Cost_GP_pr	Costs of GP visits (surgery)	33.0	37.4	31.8	32.0	0 to 822.8	57.26	110.6
Cost_GP_phone	Costs of GP visits (phone)	34.2	38.3	32.3	34.0	0 to 197.6	6.33	23.01
Cost Nurse_pr	Costs of Practice Nurse	36.4	40.4	34.3	36.4	0 to 75.95	2.10	6.54
Cost_Nure_dis	Costs of District Nurse	33.8	37.4	32.8	33.0	0 to 380	1.94	21.69
Cost_Physio_c	Costs of District Physio	33.4	35.3	32.8	33.0	0 to 1,214.4	56.27	183.1
Cost_OT_c	Costs Occupational Therapist	16.9	16.2	16.4	17.7	0 to 282	0.67	13.79

Outcomes for cost-effectiveness								
Total_QALYs	Total QALYs over 1 year	26.6	35.3	22.4	26.6	-0.225 to 0.979	0.66	0.207
Total Costs	Total costs over 1 year	40.5	44.4	38.8	40.4	0 to 5,732.54	1,372.36	1,095.99

^For those who had ESP/surgery (MUA/ACR).

~ Costs of post-procedure physiotherapy for those who had surgery (MUA/ACR).

a Any treatments received before/during receiving randomized treatment.

b Any treatments received after completing randomized treatment.

c Any non-trial treatments the patient had if they did not start/complete their randomized treatment.

d Cost of further treatments following crossover.

e Hospital inpatient stay costs related to complications.

f Outpatient hospital costs related to complications.

g Costs of adverse event.

ACR, arthroscopic capsular release; EQ-5D-5L, EuroQoL five-dimension five-level questionnaire; ESP, early structured physiotherapy; GP, general practitioner; MUA, manipulation under anaesthesia; OSS, Oxford Shoulder Score; PPP, post-procedure physiotherapy; QALY, quality-adjusted life year; SD, standard deviation.

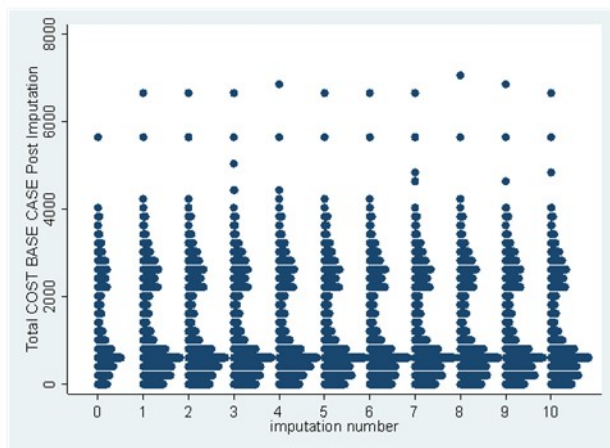


Figure aa. Post imputation distributions: total costs post imputation.

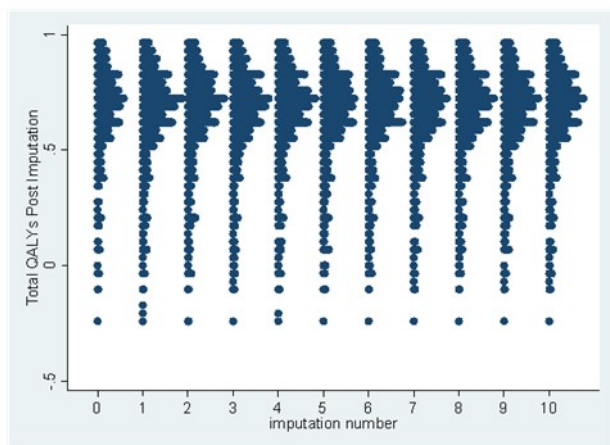


Figure ab. Post imputation distributions: total quality-adjusted life years (QALYs) post imputation.

**Table iii.** Logistic regression for 1) missingness of costs and quality-adjusted life years (QALYs) on baseline variables; and 2) for missingness between missing costs and QALYs and observed outcomes.

Variable	Odds ratio in logistic regression for missing data (95% CI)	
	Missing data on costs	Missing data on QALYs
Treatment allocation ~ (MUA vs ESP)	0.80 (0.48 to 1.32)	0.60 (0.34 to 1.05)
Treatment allocation ~ (ACR vs ESP)	0.85 (0.52 to 1.41)	0.71 (0.41 to 1.23)
Sex	1.26 (0.85 to 1.88)	0.87 (0.55 to 1.37)
Age	0.99 (0.97 to 1.01)	0.95 (0.93 to 0.98)*
Diabetes	1.11 (0.89 to 1.38)	1.06 (0.82 to 1.35)
EQ-5D at baseline	0.28 (0.14 to 0.57)*	0.31 (0.14 to 0.67)*
QALYs at 3 months	0.003 (0.00 to 0.09)*	0.00 (0.00 to 0.50)*
QALYs at 6 months	0.007 (0.00 to 0.306)*	0.15 (0.0001 to 1.15)
Costs at 3 months	1.00 (0.99 to 1.00)	0.99 (0.99 to 1.00)
Costs at 6 months	1.00 (0.99 to 1.00)	1.00 (0.99 to 1.00)

\*Statistically insignificant results ( $p > 0.05$ )

ACR, arthroscopic capsular release; CI, confidence interval; EQ-5D, EuroQol five-dimension questionnaire; ESP, early structured physiotherapy; MUA, manipulation under anaesthesia; QALY, quality-adjusted life year.

**Table iv.** Sensitivity analysis (Scenario 6): summary for incremental analysis, cost-effectiveness results, and uncertainty of different methods to handle missing data (manipulation under anaesthesia vs early structured physiotherapy).

	Incremental cost (£) (95% CI)	Incremental QALYs (95% CI)	ICER (£ per QALY)	Probability cost-effective at £20,000/QALY
<b>MAR</b>	276.507 ^ (65.67 to 487.35) 228.605 ~ (0.94 to 456.27)	0.0396 (-0.0008 to 0.0800) 0.0339 (-0.0138 to 0.0816)	6,984  6,750	88%  81%
<b>Same MNAR parameters in MUA and ESP ~</b>				
M1: -10% QoL in both arms	228.605 (0.94 to 456.27)	0.0414 (-0.0041 to 0.0868)	5,227	89%
M2: +10% cost in both arms	234.7271 (-6.91 to 476.36)	0.0339 (-0.0138 to 0.0816)	6,935	80%
M3: -50% QoL in both arms	228.605 (0.94 to 456.27)	0.0713 (0.0221 to 0.1206)	3,204	99%
M4: +50% cost in both arms	259.2152 (-52.66 to 571.09)	0.0339 (-0.0138 to 0.0816)	7,665	78%
M5: -10% QoL and +10% costs in both arms	234.7271 (-6.91 to 476.36)	0.0413277 (-0.004 to 0.087)	5,680	88%

M6: -50% QoL and +50% costs in both arms	259.2152 (-52.66 to 571.09)	0.0710225 (0.0217 to 0.1203)	3,650	98%
<b>Different MNAR parameters in MUA and ESP</b>				
M7: -10% QoL in ESP	228.605 (0.94 to 456.27)	0.0559849 (0.010 to 0.102)	4,083	96%
M8: -10% QoL in MUA	228.605 (0.94 to 456.27)	0.0192851 (-0.0281 to 0.0667)	11,854	62%
M9: +10% cost in ESP	199.748 (-32.80 to 432.29)	0.0338503 (-0.0139 to 0.0816)	5,901	82%
M10: +10% cost in MUA	261.540 (28.02 to 495.06)	0.0338673 (-0.0138 to 0.0816)	7,722	79%
M11: -50% QoL in ESP	228.605 (0.94 to 456.27)	0.144459 (0.101 to 0.188)	1,582	99%
M12: -50% QoL in MUA	228.605 (0.94 to 456.27)	-0.0390401 (-0.0895 to 0.0114)	-5,856	3%
M13: +50% cost in ESP	84.318 (-171.7 to 340.42)	0.0337907 (-0.0139 to 0.0815)	2,495	87%
M14: +50% cost in MUA	393.28 (130.9 to 655.60)	0.0338787 (-0.014 to 0.082)	11,608	71%

CI, confidence interval; ESP, early structured physiotherapy; ICER, incremental cost-effectiveness ratio; MAR, missing at random; MNAR, missing not at random; MUA, manipulation under anaesthesia; QALY, quality-adjusted life year; QoL, quality of life.