

# Supplementary Materials

for

Foster NE, Mullis R, Hill JC, et al. Effect of stratified care for low back pain in family practice (IMPACT Back): a prospective population-based sequential comparison. *Ann Fam Med*. 2014;12(2):102-111.

**Supplemental Table 1. Details of the Unit Costs Assigned to Health Care Resource Use Data and Periods of Work Absence Collected at 6-Month Follow-up**

Health Care Resource	Unit Cost , £
Primary care contacts	
Family physician: surgery consultation	31.00
Family physician: home visit	105.00
Practice nurse: surgery consultation	11.00
Practice nurse: home visit	20.00
Physiotherapy sessions	
Initial 45-minute assessment	32.25
Initial 1-hour assessment (high risk, phase 3 patients only)	43.00
Follow-up sessions	21.50
Hospital-based care	
Consultant: back pain first attendance	124.00
Consultant: back pain follow-up	103.00
Consultant: "other" first attendance	190.00
Consultant: "other" follow-up	130.00
NHS admission: day case	562.00
NHS admission: elective stay	1,157.00
Diagnostic tests: radiograph	31.99
Diagnostic tests: CT scan	100
Diagnostic tests: MRI scan	179
Diagnostic tests: blood test	17.28
Epidural injections	204.57
Other health care professionals <sup>a</sup>	
First consultation	38.00
Follow-up consultation	29.00
Out-of-pocket treatments	Patient-reported costs
Prescribed medication	Patient-specific
Periods of work absence	Patient-specific

CT = computed tomography; MRI = magnetic resonance imaging; NHS = National Health System.

<sup>a</sup> Hospital based or private practice, for example, acupuncture, osteopathy, hydrotherapy.

**Supplemental Table 2. Process of Care Outcomes at 6-Month Follow-up (Per-Protocol Analysis)**

<b>Outcome</b>	<b>Phase 1 (n = 368) No. (%)</b>	<b>Phase 3 (n = 393) No. (%)</b>	<b>Odds Ratio (95% CI)</b>	<b>P Value<sup>a</sup></b>
<b>Reconsulted family physician</b>	88 (29)	110 (37)	1.46 (1.04-2.05)	.03
<b>Prescribed medications<sup>b</sup></b>				
Nonsteroidal anti-inflammatory drugs	136 (44)	111 (37)	0.75 (0.54-1.03)	.08
Antidepressants	31 (10)	31 (10)	1.03 (0.61-1.75)	.90
Nonopioids	66 (22)	37 (12)	0.52 (0.33-0.80)	.003
Opioids	88 (29)	147 (49)	2.42 (1.73-3.39)	<.001
Strong opioids <sup>c</sup>	73 (24)	83 (28)	1.24 (0.86-1.78)	.25
Weak opioids only	15 (5)	64 (21)	5.32 (2.96-9.59)	<.001
Neuromodulators/antiepileptics	18 (6)	16 (5)	0.91 (0.46-1.82)	.79
<b>Issued sickness certification</b>	45 (15)	26 (9)	0.56 (0.33-0.93)	.02
<b>Had diagnostic tests ordered</b>				
Blood test ordered	110 (36)	111 (37)	1.06 (0.76-1.48)	.72
MRI scan/radiograph ordered	47 (15)	36 (12)	0.76 (0.48-1.21)	.25

MRI = magnetic resonance imaging.

<sup>a</sup> Derived by  $\chi^2$  test.

<sup>b</sup> Ascertained from British National Formulary codes: nonsteroidal drugs (10.1.1), antidepressants (4.3.1), nonopioids (4.7.1), opioids (4.7.2), and antiepileptics (4.8.1).

<sup>c</sup> Buprenorphine, butrans, co-codamol, codeine phosphate, DF Forte, Dtrans, fentanyl, kapake, matrifen, morphine, nabumetone, oxycodone, oxycontin, OxyNorm, Palladone, pethidine, tramadol, trazodone, Zydol.

**Supplemental Table 3. Patient Clinical Outcomes at 6-Month Follow-up (Per-Protocol Analysis)**

<b>Outcome</b>	<b>Phase 1 (n = 368)</b>	<b>Phase 3 (n = 393)</b>	<b>Effect Estimate<sup>a</sup> (95% CI)</b>	<b>P Value<sup>a</sup></b>
<b>Function and pain</b>				
Disability: change in RMDQ score	2.2 (6.0)	3.0 (5.5)	0.97 (0.29 to 1.65) <sup>b</sup>	.005
Achieved MCID, <sup>c</sup> No. (%)	185 (50)	232 (59)	1.50 (1.06 to 2.11) <sup>d</sup>	.02
Pain intensity: change in NRS rating	1.7 (2.8)	2.0 (3.0)	0.45 (0.06 to 0.84) <sup>b</sup>	.03
Physical function: change in SF-12 PCS score	-3.7 (12.2)	-4.3 (15.6)	-1.21 (-2.98 to 0.56) <sup>b</sup>	.18
<b>Psychosocial outcomes</b>				
Catastrophization: change in PCS-CAT score	1.7 (8.3)	2.0 (9.1)	0.41 (-0.82 to 1.64) <sup>b</sup>	.48
Fear avoidance: change in TSK score	2.5 (7.6)	4.0 (11.8)	1.91 (0.68 to 3.15) <sup>b</sup>	.005
Anxiety: change in HADS subscale score	1.0 (4.4)	1.4 (4.9)	0.60 (-0.10 to 1.31) <sup>b</sup>	.09
Depression: change in HADS subscale score	1.0 (4.0)	1.5 (3.8)	0.64 (0.15 to 1.13) <sup>b</sup>	.01
Mental health: change in SF-12 MCS score	-1.9 (14.7)	-2.0 (13.5)	-0.63 (-2.97 to 1.71) <sup>b</sup>	.57
Pain self-efficacy: change in PSEQ score	-7.6 (12.8)	-7.6 (15.5)	-1.09 (-3.08 to 0.91) <sup>b</sup>	.27
<b>Global change since baseline, No. (%)</b>				
Completely recovered	38 (10)	44 (11)	1.34 (1.01 to 1.80) <sup>d</sup>	.048
Much better	102 (28)	128 (33)		
Better	88 (24)	97 (25)		
No change	95 (26)	90 (23)		
Worse/much worse	45 (12)	34 (9)		
<b>Risk group, No (%)</b>				
Low	157 (68)	291 (74)	1.73 (1.19 to 2.50) <sup>d</sup>	.004
Medium	53 (23)	86 (22)		
High	22 (9)	16 (4)		
<b>Work loss<sup>e</sup></b>				
Absenteeism: days off work since baseline	7.9 (23.5)	4.7 (16.1)	0.49 (0.23 to 1.03) <sup>f</sup>	.06
Presenteeism: reduced productivity at work	2.2 (2.5)	1.9 (2.4)	0.26 (-0.36 to 0.88) <sup>b</sup>	.26
<b>Satisfaction with care received, No. (%)<sup>g</sup></b>				
Satisfied	161 (71)	150 (70)	1.12 (0.78 to 1.61) <sup>d</sup>	.53
Neutral	23 (10)	30 (14)		
Not satisfied	44 (19)	33 (16)		
<b>Satisfaction with results of care, No. (%)<sup>g</sup></b>				
Very satisfied/satisfied	133 (59)	148 (71)	1.95 (0.97 to 2.27) <sup>d</sup>	.02
Neutral	39 (17)	31 (15)		
Not satisfied	52 (23)	30 (14)		

CSQ-CAT = Coping Strategies Questionnaire – CATastrophizing subscale; HADS = Hospital Anxiety and Depression Scale; MCID = minimal clinically important difference; MCS = Mental Component Subscale; PCS = Physical Component Subscale; PSEQ = Pain Self-Efficacy Questionnaire; RMDQ = Roland and Morris Disability Questionnaire; SF-12 = Short Form 12; TSK = Tampa Scale of Kinesiophobia.

Note: Values are mean (SD) unless otherwise noted.

<sup>a</sup> Effect estimate and 95% confidence interval derived by regression analyses adjusted for age, sex, general practice, baseline RMDQ, duration of pain, and corresponding baseline value.

<sup>b</sup> Mean difference derived by linear regression.

<sup>c</sup> Based on an MCID (≥30% reduction in RMDQ score from baseline) and rating of "completely recovered" or "much better" or "better" according to the global change question.

<sup>d</sup> Odds ratio derived by binary/ordinal logistic regression.

<sup>e</sup> Based on 250 of 547 respondents who reported being currently employed at 6-month follow-up and who fulfilled per protocol criteria.

<sup>f</sup> Incidence rate ratio derived by robust Poisson regression.

<sup>g</sup> Based on 441 respondents for the care received question and 433 for the results of care question at the 6-month follow-up.

**Supplemental Table 4. Process of Care and Clinical Outcomes by Risk Group (Per-Protocol Analysis)**

Outcome	Low Risk			Medium Risk			High Risk		
	Phase 1 (n = 136)	Phase 3 (n = 146)	P Value <sup>a</sup>	Phase 1 (n = 151)	Phase 3 (n = 167)	P Value <sup>a</sup>	Phase 1 (n = 81)	Phase 3 (n = 80)	P Value <sup>a</sup>
<b>Process of care outcomes</b>									
Reconsulted family physician, No. (%)	19 (18)	24 (22)	.41	39 (31)	46 (37)	.29	30 (42)	40 (62)	.02
Prescribed medications, No. (%)									
Nonsteroidal anti-inflammatory drugs	46 (43)	28 (26)	.009	61 (48)	50 (40)	.22	29 (40)	33 (51)	.22
Antidepressants	2 (2)	5 (5)	.25	19 (15)	13 (10)	.29	10 (14)	13 (20)	.34
Nonopioids	11 (10)	7 (7)	.31	30 (23)	21 (17)	.19	25 (35)	9 (14)	.005
Opioids	19 (18)	34 (31)	.02	44 (34)	67 (54)	.002	25 (35)	46 (71)	<.001
Strong	12 (11)	18 (17)	.25	37 (29)	36 (29)	.98	24 (33)	29 (45)	.18
Weak only	7 (7)	16 (15)	.049	7 (5)	31 (25)	<.001	1 (1)	17 (26)	<.001
Neuromodulators/antiepileptics	0 (0)	0 (0)	1.00	10 (8)	4 (3)	.11	8 (11)	12 (18)	.24
Issued sickness certification, No. (%)	10 (9)	6 (6)	.29	21 (16)	10 (8)	.04	14 (20)	10 (15)	.53
Blood test ordered, No. (%)	33 (31)	33(31)	.96	46 (36)	46(37)	.89	31 (43)	32 (49)	.47
MRI scan/radiograph ordered, No. (%)	12 (11)	5 (5)	.07	20 (16)	19 (15)	.93	15 (21)	12 (18)	.73
<b>Clinical outcomes</b>									
Disability: change in RMDQ score	0.9 (5.8)	0.8 (4.1)	.91	3.4 (6.3)	3.5 (6.0)	.04	2.3 (5.8)	4.9 (6.8)	.008
Achieved MCID, <sup>b</sup> No. (%)	78 (57)	82 (56)	.75	77 (51)	106 (63)	.02	30 (37)	44 (55)	.14
Pain intensity: change in NRS rating	1.0 (2.9)	0.9 (2.7)	.46	2.3 (3.0)	2.6 (2.9)	.26	1.9 (2.6)	3.0 (3.4)	.02
Physical function: change in SF-12 PCS score	-2.2 (15.2)	-2.7 (14.6)	.92	-5.7 (13.9)	-4.5 (11.4)	.79	-2.3 (13.1)	-6.7 (15.9)	.055
Catastrophization: change in PCS-CAT score	0.5 (8.2)	0.9 (5.9)	.77	1.2 (7.3)	0.9 (9.1)	.86	4.9 (8.6)	6.1 (11.5)	.31
Fear avoidance: change in TSK score	2.8 (9.2)	3.4 (9.0)	.19	1.7 (7.6)	3.5 (7.8)	.02	3.3 (7.1)	5.9 (11.1)	.049
Anxiety: change in HADS subscale score	0.7 (4.1)	0.7 (4.2)	.86	0.8 (3.7)	1.1 (3.8)	.052	2.1 (5.5)	3.1 (4.2)	.057
Depression: change in HADS subscale score	0.4 (4.1)	0.8 (3.6)	.59	1.4 (3.3)	1.4 (3.2)	.29	1.2 (4.3)	3.0 (3.8)	.004
Mental health: change in SF-12 MCS score	-1.1 (13.4)	0.1 (12.1)	.51	-1.2 (13.8)	-1.6 (12.0)	.24	-4.8 (17.4)	-6.7 (12.3)	.54
Pain self-efficacy: change in PSEQ score	-4.9 (13.7)	-3.4 (11.5)	.42	-9.6 (16.8)	-8.5 (14.8)	.43	-8.4 (12.5)	-13.3 (17.0)	.058
Global change since baseline: much improved, No. (%)	67 (49)	79 (54)	.48	53 (35)	63 (38)	.11	19 (24)	30 (38)	.09
Risk group: low risk, No. (%)	117 (86)	131 (90)	.29	97 (64)	121 (72)	.15	35 (43)	45 (56)	.01
Absenteeism since baseline <sup>c</sup>	0.5 (2.3)	0.7 (3.0)	.37	11.3 (26.3)	6.4 (21.0)	.01	15.5 (35.5)	10.7 (19.3)	.47
Presenteeism <sup>c</sup>	1.5 (2.0)	1.1 (1.4)	.28	2.3 (2.3)	2.5 (2.9)	.65	3.7 (3.1)	2.7 (2.4)	.28
Satisfied with care received <sup>d</sup>	59 (75)	58 (77)	.93	77 (75)	68 (69)	.53	25 (54)	24 (62)	.52
Satisfied with results of care <sup>d</sup>	48 (62)	60 (80)	.007	63 (64)	65 (68)	.27	22 (47)	23 (61)	.40

Notes: Values are mean (SD) unless otherwise noted. See Supplemental Table 3 for abbreviations.

<sup>a</sup> P values were derived by  $\chi^2$  test for the process outcomes and by regression analyses for the clinical outcomes (adjusted for age, sex, family physician practice, baseline RMDQ score, duration of pain, and corresponding baseline value—as detailed in Supplemental Table 3).

<sup>b</sup> Based on an MCID ( $\geq 30\%$  reduction in RMDQ score from baseline) and rating of "completely recovered" or "much better" or "better" according to the global change question.

<sup>c</sup> Based on 250 of 547 respondents who reported being currently employed at the 6-month follow-up and who fulfilled per protocol criteria.

<sup>d</sup> Based on 441 respondents for the care received question and 433 for the results of care question at the 6-month follow-up.

**Supplemental Table 5. Back Pain-Related Health Care and Work Absence Per Patient**

<b>Health Care Resource</b>	<b>Phase 1 (n = 233)</b>	<b>Phase 3 (n = 314)</b>
Primary care contacts		
Family physician: surgery	1.19 (1.7)	1.04 (1.6)
Family physician: home visit	0.00 (0.1) <sup>a</sup>	0.02 (0.2)
Practice nurse: surgery	0.14 (0.6)	0.07 (0.3)
Practice nurse: home visit	0.00 (0.1) <sup>a</sup>	0.00 (0.1) <sup>a</sup>
Physiotherapy service		
NHS	1.40 (2.6)	1.87 (3.4)
Private health care	0.60 (2.9)	0.49 (1.7)
Hospital-based care		
NHS consultant	0.29 (0.8)	0.26 (0.7)
NHS admissions	0.01 (0.1)	0.01 (0.1)
NHS radiograph	0.14 (0.4)	0.12 (0.3)
NHS CT scan	0.00 (0.1) <sup>a</sup>	0.01 (0.1)
NHS MRI scan	0.09 (0.3)	0.10 (0.3)
NHS blood tests	0.02 (0.1)	0.00 (0.1) <sup>a</sup>
NHS epidural injections	0.02 (0.1)	0.01 (0.1)
Private consultant	0.14 (0.7)	0.08 (0.5)
Private admissions	0.00 (0.1) <sup>a</sup>	0.00 (0.1) <sup>a</sup>
Private diagnostic tests	0.02 (0.1)	0.03 (0.2)
Private epidural injections	0.00 (0.1) <sup>a</sup>	0.00 (0.0) <sup>a</sup>
Other health care professionals		
NHS acupuncture	0.08 (0.6)	0.06 (0.7)
NHS osteopathy	0.00 (0.7) <sup>a</sup>	0.11 (0.7)
NHS "other"	0.21 (1.3)	0.13 (0.8)
Private acupuncture	0.42 (2.4)	0.11 (0.8)
Private osteopathy	0.37 (1.3)	0.31 (1.3)
Private "other"	0.54 (2.2)	0.16 (0.8)
Out-of-pocket treatments <sup>b</sup>	120 (52)	161 (51)
Prescribed medication <sup>b</sup>	127 (55)	161 (51)
Work absence outcomes <sup>c</sup>		
Reported time off work due to low back pain <sup>d</sup>	35 (27)	39 (25)
Back pain-related work absence, days	7.74 (23.4)	4.20 (14.3)

CT = computed tomography; MRI = magnetic resonance imaging; NHS = National Health Service.

Note: Based on participants providing responses to the resource use questions at 6 months (N = 547). Values are mean (SD) number of consultations/tests unless stated otherwise

<sup>a</sup> The value of 0.00 is positive, rounded to 2 decimal places.

<sup>b</sup> The number (percentage) of participants reporting use of out-of-pocket and prescribed medications are given.

<sup>c</sup> Based on the subsample of respondents in paid employment at 6-month follow-up; 132 of 229 (58%) in phase 1 and 158 of 310 (51%) in phase 3.

<sup>d</sup> Number (percentage) relating to the subsample of respondents in employment at 6-month follow-up.

**Supplemental Table 6. Descriptive and Incremental EQ-5D and QALY Scores at 6-Month Follow-up**

<b>Health Outcomes</b>	<b>Phase 1</b>	<b>Phase 3</b>	<b>Mean Difference<sup>a</sup> (95% CI)</b>	<b>P Value</b>
Base case (imputed) analysis	(n = 368)	(n = 554)	–	–
Baseline EQ-5D score	0.602 (0.31)	0.628 (0.29)	0.026 (–0.01 to 0.07)	–
2-month EQ-5D score	0.676 (0.30)	0.691 (0.30)	0.015 (–0.03 to 0.06)	–
6-month EQ-5D score	0.702 (0.33)	0.725 (0.29)	0.023 (–0.01 to 0.06)	–
QALYs at 6 months	0.336 (0.13)	0.346 (0.15)	0.010 (–0.01 to 0.03)	–
QALYs at 6 months <sup>b</sup> (controlled for baseline imbalances)	–	–	0.003 (–0.01 to 0.02)	.67 (2 d.p.)
Complete case analysis <sup>b</sup>	(n = 193)	(n = 254)	–	–
QALYs at 6 months	0.341 (0.11)	0.356 (0.10)	0.008 (–0.01 to 0.02)	.29 (2 d.p.)

EQ-5D = EuroQOL 5-dimension questionnaire; QALY = quality-adjusted life-year.

Note: Values are mean (SD) scores unless stated otherwise.

<sup>a</sup> Difference = Phase 3 group mean minus Phase 1 group mean. Confidence intervals were generated using conventional parametric methods.

<sup>b</sup> The incremental QALY is the estimate after adjusting for age, sex, practice, duration of pain at baseline, and baseline scores on the Roland-Morris Disability Questionnaire and EQ-5D.

**Supplemental Figure 1. Cost-utility plane for the overall comparison of stratified care (Phase 3) compared to usual care (Phase 1).**

The cost-utility plane illustrates uncertainty in the mean incremental health care cost and QALY estimates. The boxed numbers represent the percentage of bootstrapped cost-utility pairs in each quadrant. A position of dominance is observed in the majority of replications (59%), i.e. health benefits and cost savings, but there is a considerable degree of uncertainty around both incremental estimates.

