Appendix Table A1. Missingness of data for each outcome at baseline, week 5, week 10, and four months.

	Baseline		Week 5		Week 10		4 months	
	IG	CG	IG	CG	IG	CG	IG	CG
SPADI score	0	0	28	12	36	17	29	19
Abduction strength	0	1	32	16	40	19	32	21
External rotation strength	0	0	32	15	40	19	32	21
Abduction range-of-motion	0	0	32	15	40	19	32	20
Pain last week	0	0	31	15	39	19	31	20
EQ-5D-index-TTO	3	0	29	14	36	17	30	20
EQ-5D-index-VAS	3	0	29	14	36	17	30	20
Self-rated health	0	0	28	13	36	20	30	19

Appendix Table A2. Primary and secondary outcomes at each follow up time-point, separately for intervention and control group

	Baseline		Week 5		Week 10		4 months	
	IG	CG	IG	CG	IG	CG	IG	CG
SPADI score *0=best, 100=worst*	57 ±19	57 ±19	42 ±24	40 ±26	36 ±24	39 ±26	35 ±27	34 ±27
Abduction strength *Nm/kg*	0.49 ±0.23	0.42 ±0.23	0.50 ±0.25	0.42 ±0.24	0.49 ±0.24	0.43 ±0.23	0.52 ±0.25	0.46 ±0.27
External rotation strength *Nm/kg*	0.22 ±0.09	0.20 ±0.09	0.22 ±0.09	0.19 ±0.09	0.22 ±0.09	0.19 ±0.08	0.23 ±0.09	0.20 ±0.08
Abduction range-of-motion *Degrees*	122 ±40	123 ±43	134 ±37	132 ±41	137 ±37	135 ±40	144 ±36	140 ±39
Pain last week *0=no pain, 10=worst pain*	3.2 ±1.9	3.3 ±2.2	2.9 ±2.1	2.6 ±2.2	2.7 ±2.1	2.7 ±2.4	2.5 ±2.3	2.5 ±2.3
EQ-5D-index-TTO *0=worst, 1=best*	0.65 ±0.2	0.68 ±0.16	0.69 ±0.17	0.72 ±0.18	0.71 ±0.17	0.72 ±0.18	0.7 ±0.2	0.73 ±0.2
EQ-5D-index-VAS *0=worst, 1=best*	0.53 ±0.12	0.55 ±0.13	0.56 ±0.15	0.59 ±0.17	0.58 ±0.18	0.61 ±0.18	0.6 ±0.19	0.62 ±0.18
Self-rated health *0=worst, 100=best*	68 ±19	70 ±18	69 ±20	69 ±19	71 ±18	71 ±19	72 ±18	72 ±20

Appendix Table A3. Per protocol analyses. Between-group differences (IG – CG) for changes in primary and secondary outcomes separately for each follow-up time-point interval.

	Baseline to week 5	Week 5 to week 10	Week 10 to 4 months	Baseline to 4 months
SPADI score *0=best, 100=worst*	0.0 (-5.6 to 5.6)	-4.4 (-10.3 to 1.5)	2.8 (-3.2 to 8.7)	-1.6 (-7.3 to 4.2)
Abduction strength *Nm/kg*	0.02 (-0.02 to 0.05)	-0.02 (-0.06 to 0.01)	-0.01 (-0.04 to 0.03)	-0.01 (-0.05 to 0.02)
External rotation strength *Nm/kg*	0.01 (-0.01 to 0.02)	0.00 (-0.01 to 0.02)	0.00 (-0.02 to 0.01)	0.01 (-0.01 to 0.02)
Abduction range-of-motion *Degrees*	3.7 (-5.2 to 12.7)	1.5 (-8.1 to 11.2)	1.5 (-8.2 to 11.3)	6.8 (-2.3 to 15.9)
Pain last week *0=no pain, 10=worst pain*	0.1 (-0.4 to 0.6)	-0.3 (-0.9 to 0.2)	0.0 (-0.6 to 0.6)	-0.2 (-0.7 to 0.3)
EQ-5D-index-TTO *0=worst, 1=best*	0.00 (-0.04 to 0.05)	0.02 (-0.04 to 0.07)	-0.02 (-0.07 to 0.03)	-0.01 (-0.05 to 0.04)
EQ-5D-index-VAS *0=worst, 1=best*	-0.01 (-0.06 to 0.03)	0.01 (-0.04 to 0.06)	-0.01 (-0.06 to 0.04)	-0.01 (-0.06 to 0.03)
Self-rated health *0=worst, 100=best*	3.1 (-1.9 to 8.0)	-1.2 (-6.7 to 4.2)	-2.7 (-8.4 to 3.0)	-0.8 (-6.0 to 4.4)

Appendix Table A4. Add-on intervention dosage and time spent on usual care exercise.

	CG		IG	
Minutes per week spent on usual care exercise	**Average**	**N=**	**Average**	**N=**
Week 1	29	95	29	89
Week 2	38	94	31	86
Week 3	48	96	39	83
Week 4	50	93	37	80
Week 5	55	94	43	75
Week 6	51	93	44	77
Week 7	56	95	43	76
Week 8	59	95	38	76
Week 9	52	92	36	75
Week 10	52	92	37	77
Week 11	57	90	32	74
Week 12	58	91	31	72
Week 13	54	91	28	72
Week 14	50	90	30	74
Week 15	52	89	33	71
Week 16	57	88	30	69
Time-under-tension in hours per phase				
Phase 1 (Week 1-5)	-		1.6	90
Phase 2 (Week 6-10)	-		0.8	88
Phase 3 (Week 11-16)	-		0.6	83

Reasons for missing data for time-under-tension. Phase 1: Changed diagnosis (n=2), Technical issues (n=1), lost unit (n=7). Phase 2; Changed diagnosis (n=3), Technical issues (n=1), lost sensor (n=6), surgery (n=1), refused to use the sensor (n=1). Phase 3: Changed diagnosis (n=4), Technical issues (n=3), lost sensor (n=7), surgery (n=2), refused to use the sensor (n=1).

Appendix Table A5. Concomitant care and pain medication use.

	CG	IG
Concomitant care		
Physiotherapy in usual care		
Individual sessions, total number reported	463	373
Class sessions, total number reported	185	68
Doctor visits		
General practitioner, total number reported	19	15
Specialist practitioner, total number reported	46	36
Steroid injections	11	8
Pain medication use, average times per week		
Week 1-5		
0 times per week	59% (n=48)	59% (n=41)
1-7 times per week	33% (n=27)	32% (n=22)
more than 7 times per week	7% (n=6)	10% (n=7)
Week 6-10		
0 times per week	57% (n=46)	63% (n=39)
1-7 times per week	35% (n=28)	24% (n=15)
more than 7 times per week	9% (n=7)	13% (n=8)
Week 11-16		
0 times per week	56% (n=45)	60% (n=42)
1-7 times per week	35% (n=28)	30% (n=21)
more than 7 times per week	10% (n=8)	10% (n=7)

Patient and public involvement statement

Before planning the current trial, our group conducted a consecutive cohort study of 129 patients with subacromial impingement to evaluate the outcome of usual care.[1] We also collected patient-reported information on usual care activities (number of physiotherapy sessions, time spent on shoulder exercise, etc.) through structured interviews. During the interviews, we noted that some patients spontaneously complained about unsatisfactory outcomes of non-operative care. These complaints were supported by outcome data, showing a general lack of improvement in shoulder function following current care.(16) Collectively, the knowledge gained from outcome data and spontaneous complaints had a substantial impact on the decision to undertake the current study and the focus of the add-on intervention. After having developed the add-on intervention, we invited five patients with subacromial impingement from our clinical department to take part in a full intervention session. We then asked the patients to provide inputs to the intervention as well as the layout and readability of the intervention leaflets, but this did not result in any alterations. The results of the current trial will be disseminated directly to all participants via secured email. We also plan to invite all participants to comment on a layperson summary and/or infographic of the study findings. We plan to use these inputs to improve future dissemination of results.

Outcomes reported in subsequent publications

In this publication (the primary trial report) we are reporting the following outcomes:

- SPADI [Time Frame: 16 weeks]
- Abduction strength [Time Frame: 16 weeks]
- External rotation strength [Time Frame: 16 weeks]
- Abduction ROM [Time Frame: 16 weeks]
- Pain last week [Time Frame: 16 weeks]
- QoL-index [Time Frame: 16 weeks]
- QoL-VAS [Time Frame: 16 weeks]
- Global impression of change [Time Frame: 16 weeks]
- PASS [Time Frame: 16 weeks]

As outlined in the registration (ClinicalTrials.gov NCT02747251) and trial protocol, the outcomes listed below will be reported in subsequent publications with a clear reference to the primary trial report and trial identifier. These outcomes represent the embedded mechanistic part of the trial.

- PCS [Time Frame: 16 weeks]
- Temporal summation of pain (TS) [Time Frame: 16 weeks]
- CPM-Threshold [Time Frame: 16 weeks]
- CPM-Detection [Time Frame: 16 weeks]
- PPT-deltoid [Time Frame: 16 weeks]
- PPT-Supraspinatus [Time Frame: 16 weeks]
- PPT-Infraspinatus [Time Frame: 16 weeks]
- PPT-worst [Time Frame: 16 weeks]
- SDT [Time Frame: 16 weeks]
- mSAT [Time Frame: 16 weeks]
- SPADI [Time Frame: 52 weeks]
- QoL-VAS [Time Frame: 52 weeks]
- QoL-index [Time Frame: 52 weeks]
- Surgery [Time Frame: 52 weeks]
- Sick leave [Time Frame: 52 weeks]