### Supplementary file 1. Table. Baseline characteristics for HEAVY and LIGHT.

| Variables | LIGHT n=50 | HEAVY n=50 |
|-----------|------------|------------|
| Physical activity (IPAQ short version), n (%) | | |
| Low | 28 (56) | 25 (50) |
| Moderate | 16 (32) | 20 (40) |
| High | 6 (12) | 5 (10) |
| Education (%) | | |
| Academic education | 24 (48) | 26 (52) |
| Vocational education | 12 (24) | 16 (32) |
| Unskilled labour/no education | 14 (28) | 8 (16) |
| Employment status (%) | | |
| Full-time | 26 (52) | 28 (56) |
| Part-time/flex job/sick listed | 6 (12) | 12 (24) |
| Student | 12 (24) | 5 (10) |
| Unemployed/retired | 6 (12) | 5 (10) |
| Previous shoulder treatment? (yes %) | | |
| Physiotherapy exercise | 26 (52) | 30 (60) |
| Physiotherapy passive treatment | 18 (36) | 26 (52) |
| Chiropractic | 8 (16) | 8 (16) |
| Analgesic medication (prescribed) | 11 (22) | 8 (16) |
| Other treatment | 15 (30) | 12 (24) |
| Surgery | 9 (18) | 9 (18) |
| Secondary self-reported outcomes | | |
| WOSI Physical symptoms (scale 0–1000) | 469.0 (182.1) | 474.8 (179.6) |
| WOSI Sports/recreation/work (scale 0–400) | 211.2 (96.1) | 192.2 (95.8) |
| WOSI Lifestyle (scale 0–400) | 185.9 (91.9) | 174.6 (77.3) |
| WOSI Emotions (scale 0–300) | 205.4 (62.9) | 200.6 (51.5) |
| Shoulder pain past seven days (scale 0-10) | | |
| Lowest rating | 2.4 (2.2) | 2.4 (1.9) |
| Highest rating | 6.5 (2.7) | 6.0 (2.2) |
| Average rating | 4.1 (2.2) | 3.9 (2.1) |
| Discomfort due to mechanical shoulder symptoms past seven days (scale 0-10) | | |
| Lowest rating | 2.4 (2.3) | 2.5 (2.1) |
| Highest rating | 4.9 (2.4) | 4.4 (2.7) |
| Average rating | 3.7 (2.1) | 3.2 (2.1) |
| Patient-Specific Functional Scale (scale 0-10) | 3.9 (2.1) | 3.9 (1.7) |
| Checklist Individual Strength (scale 8-56) | 37.2 (9.8) | 36.9 (11.4) |
| COOP/WONCA (scale 6-30) | 15.0 (3.5) | 13.9 (3.7) |
| Tampa Scale of Kinesiophobia (scale 11-44) | 23.4 (5.2) | 22.1 (5.8) |
| EQ-5D-5L (scale <0-1) | 0.67 (0.16) | 0.72 (0.11) |
| EQ-VAS (scale 0-100) | 58.9 (21.2) | 70.4 (16.5) |
| Secondary objective outcomes | | |
| Range of motion (˚) | | |
| Internal rotation passive | 71 (19) | 68 (17) |
| Internal rotation active | 68 (19) | 65 (18) |
| External rotation passive | 100 (23) | 105 (23) |
| External rotation active | 97 (22) | 102 (21) |
| Isometric shoulder torque strength (Nm/kg) | | |
| Scaption | 0.45 (0.20) | 0.45 (0.22) |
| Internal rotation | 0.33 (0.15) | 0.33 (0.16) |
| External rotation | 0.25 (0.10) | 0.24 (0.11) |
| Proprioception in flexion (error ˚) | | |
| Low range, | 5.1 (3.2) | 4.4 (2.6) |
### Shoulder Instability and Laxity Tests (Positive %)

| Test                                      | Positive | Median (IQR) |
|-------------------------------------------|----------|--------------|
| Shoulder flexion test, positive = yes     | 33 (66)  | 30 (60)      |
| Shoulder rotation test, positive >180°    | 20 (40)  | 20 (40)      |
| Apprehension test†, positive = yes        | 36 (72)  | 38 (76)      |
| Relocation test*, positive = yes          | 27 (54)  | 29 (58)      |
| Release test*, positive = yes             | 24 (48)  | 21 (42)      |
| Load and shift anterior ‡, positive 2-3   | 38 (76)  | 44 (88)      |
| Load and shift posterior ‡, positive 2-3  | 19 (38)  | 14 (28)      |
| Sulcus sign, positive >1 cm               | 43 (86)  | 46 (92)      |
| Gagey‡, positive >105°                    | 36 (72)  | 44 (88)      |
| Rotés Queról‡, positive > 90°            | 26 (52)  | 22 (44)      |

Continuous data are presented as mean or median with 95% confidence interval (CI), and categorical variables are presented as frequency % (95% CI).

*Relocation and release tests were only performed on patients with a positive apprehension test.

† Of 74 patients with a positive apprehension test, 40 patients reported pain, 20 patients reported apprehension, and 14 patients reported both pain and apprehension.

‡ Of 100 patients, 17 patients were unable to complete the shoulder flexion test, 8 the Gagey test, 6 the Rotés Queról test, 1 the load and shift anterior test, and 3 the load and shift posterior test, resulting in the test scores for these patients were interpreted as negative.

Abbreviations: CIS, Checklist Individual Strength; COOP/WONCA, Dartmouth Primary Care Cooperative Research Network/World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians; EQ-5D-5L, European Quality of life - 5 Dimensions – Five-Level; IPAQ, International Physical Activity Questionnaire; NPRS, Numeric Pain Rating Scale; VAS, Visual Analogue Scale; WOSI, Western Ontario Shoulder Instability Index.
### Supplementary file 2. Table. Self-reported pain medication and other treatments received during the 16-week intervention (as observed)

|                  | LIGHT | HEAVY | Between-Group Risk Difference or Median Difference (*) with 95% CI (unadjusted) |
|------------------|-------|-------|--------------------------------------------------------------------------------|
| **Pain medication for index shoulder** |       |       |                                                                                |
| **Week 1**       |       |       |                                                                                |
| Number of participants (n) | 48    | 48    |                                                                                |
| Use of pain medication (n (%)) |       |       |                                                                                |
| No pills         | 38 (79) | 39 (81) | -4 (-20, 12) |
| < 1 pills/day    | 3 (6)   | 6 (13)  | 8 (-4, 20)  |
| 1-4 pills/day    | 4 (8)   | 2 (4)   | -4 (-14, 5) |
| > 4 pills/day    | 3 (6)   | 1 (2)   | -4 (-12, 4) |
| Type of pain medication |       |       |                                                                                |
| Paracetamol      | 10 (20.8) | 7 (14.6) | -6 (-21, 9) |
| NSAIDs           | 6 (12.5)  | 2 (4.2)  | -8 (-19, 3) |
| Other            | 1 (2.1)   | 2 (4.2)  | 2 (-5, 9)   |
| Days of pain medication use (median, 95% CI)* | 4 (2.7, 7) | 2 (1.2, 9) | -2 (-3.5, -0.5) |
| **Week 16**      |       |       |                                                                                |
| Number of participants (n) | 42    | 41    |                                                                                |
| Use of pain medication (n (%)) |       |       |                                                                                |
| No pills         | 5 (11.9)  | 4 (9.8)  | -2 (-16, 11) |
| < 1 pills/day    | 2 (5)    | 1 (2.4)  | -2 (-10, 6) |
| 1-4 pills/day    | 2 (5)    | 2 (5)    | 0 (-9, 9)   |
| > 4 pills/day    | 0 (0)    | 1 (2.4)  | 2 (-2, 7)   |
| Type of pain medication |       |       |                                                                                |
| Paracetamol      | 3 (7)    | 4 (10)   | 3 (-9, 15)  |
| NSAIDs           | 2 (5)    | 1 (2)    | -2 (-10, 6) |
| Other            | 2 (5)    | 2 (5)    | 0 (-9, 9)   |
| Days of pain medication use (median, 95% CI)* | 7 (1.7)  | 4 (1.7)  | -3 (-16, 10) |
| **Other treatments received** |       |       |                                                                                |
| Number of participants | 49    | 48    |                                                                                |
| Sought GP during the 16-week intervention period (n (%)) because of the affected shoulder | 7 (14.3) | 5 (10.4) | -4 (-17, 9) |
| Received other treatment(s) for the affected shoulder (n (%)) |       |       |                                                                                |
| No other treatment | 35 (71.4) | 37 (77.1) | 6 (-12, 23) |
| Physiotherapy (exercises) | 0 (0.0)  | 2 (4.2)  | 4 (-1, 10)  |
| Physiotherapy (stretch, ultrasound, massage) | 4 (8.2)  | 2 (4.2)  | -4 (-14, 6) |
| Professional massage | 5 (10.2)  | 5 (10.4)  | 0 (-12, 12) |
| Chiropractor     | 3 (6.1)   | 1 (2.1)  | -4 (-12, 4) |
| Acupuncture      | 1 (2.0)   | 2 (4.2)  | 2 (-5, 9)   |
| Pain medication prescribed by GP | 2 (4.1)  | 1 (2.1)  | -2 (-9.5)   |
| Other            | 8 (16.3)  | 3 (6.3)  | -10 (-22, 2) |

Abbreviations: CI, confidence interval; GP, General practitioner; NSAIDs, Non-steroidal anti-inflammatory drugs.

* Based on the proportion of patients reporting use of pain medication.
Statistically significant results (p<0.05) are marked with bold.
### Supplementary file 3. Table. Outcomes at 16-week follow-up for HEAVY and LIGHT presented for sensitivity analysis using intention-to-treat baseline value varied forward (ITT BVCF) and the per protocol (PP) analysis (multiple data imputation) for patients having satisfactory adherence to the interventions.

|                         | Total no. of assessments (LIGHT/HEAVY) | Mean at 16 weeks in LIGHT (95% CI) n (ITT) = 50 | Mean at 16 weeks in HEAVY (95% CI) n (ITT) = 50 | Between-Group difference at 16 weeks (crude) (95% CI) | Between-Group difference at 16 weeks (adjusted) † (95% CI) |
|-------------------------|----------------------------------------|-----------------------------------------------|-----------------------------------------------|------------------------------------------------|------------------------------------------------|
| Primary outcome measure |                                        |                                               |                                               |                                                |                                                |
| WOSI total (scale 0-2100) |                                        |                                               |                                               |                                                |                                                |
| ITT BVCF                | 96/97                                  | 834.4 (722.3, 946.5)                           | 616.1 (495.2, 737.1)                           | -218.3 (-383.3, -53.3)                          | -198.7 (-335.3, -62.1)                          |
| PP                      | 66/68                                  | 725.1 (597.8, 852.4)                           | 475.0 (350.6, 599.4)                           | -250.0 (-424.7, -75.3)                          | -250.7 (-323.4, -178.0)                         |
| Secondary self-reported outcomes |                                      |                                               |                                               |                                                |                                                |
| WOSI Physical symptoms (scale 0–100) |                                        |                                               |                                               |                                                |                                                |
| ITT BVCF                | 96/97                                  | 360.2 (302.8, 417.6)                           | 283.5 (228.7, 338.3)                           | -76.7 (-155.1, 1.7)                             | -78.9 (-142.8, -15.0)                           |
| PP                      | 66/68                                  | 307.5 (239.9, 375.1)                           | 216.5 (161.0, 272.0)                           | -91.0 (-176.6, -5.4)                            | -96.8 (-140.3, -53.3)                           |
| WOSI Sports/recreation/work (scale 0–400) |                                      |                                               |                                               |                                                |                                                |
| ITT BVCF                | 96/97                                  | 158.8 (131.9, 185.6)                           | 110.7 (82.4, 138.9)                            | -48.1 (-86.6, -9.6)                             | -39.4 (-70.6, -8.1)                             |
| PP                      | 66/68                                  | 140.2 (108.9, 171.6)                           | 83.7 (54.4, 113.0)                             | -56.5 (-98.6, -14.4)                            | -50.3 (-83.0, -17.5)                            |
| WOSI Lifestyle (scale 0–400) |                                        |                                               |                                               |                                                |                                                |
| ITT BVCF                | 96/97                                  | 141.0 (116.4, 165.7)                           | 97.5 (72.0, 123.0)                             | -43.5 (-78.6, -8.5)                             | -36.9 (-59.7, -14.1)                            |
| PP                      | 66/68                                  | 118.2 (89.1, 147.3)                            | 74.2 (47.6, 100.7)                             | -44.0 (-82.7, -5.4)                             | -49.7 (-65.1, -34.3)                            |
| WOSI Emotions (scale 0–300) |                                        |                                               |                                               |                                                |                                                |
| ITT BVCF                | 96/97                                  | 169.3 (150.2, 188.4)                           | 121.7 (99.6, 143.8)                            | -50.0 (-79.9, -20.0)                            | -46.0 (-67.4, -24.6)                            |
| PP                      | 66/68                                  | 159.2 (135.4, 182.8)                           | 100.6 (76.3, 125.0)                            | -58.5 (-91.8, -25.2)                            | -56.2 (-71.6, -40.8)                            |
| Shoulder pain last 7 days (scale 0-10) |                                        |                                               |                                               |                                                |                                                |
| Lowest rating           |                                        |                                               |                                               |                                                |                                                |
| ITT BVCF                | 95/97                                  | 1.3 (0.8, 1.8)                                | 1.1 (0.6, 1.6)                                | -0.3 (-1.1, 0.4)                               | -0.4 (-1.1, 0.3)                               |
| PP                      | 66/68                                  | 0.8 (0.4, 1.3)                                | 0.4 (0.2, 0.7)                                | -0.4 (-0.9, 0.1)                               | -0.5 (-1.0, 0.0)                               |
| Highest rating          |                                        |                                               |                                               |                                                |                                                |
| ITT BVCF                | 95/97                                  | 4.0 (3.3, 4.8)                                | 2.8 (2.1, 3.5)                                | -1.4 (-2.4, -0.3)                              | -1.1 (-2.0, -0.2)                              |
| PP                      | 66/68                                  | 3.2 (2.5, 3.9)                                | 1.8 (1.2, 2.4)                                | -1.4 (-2.2, -0.5)                              | -1.2 (-1.8, -0.6)                              |
| Average rating          |                                        |                                               |                                               |                                                |                                                |
| ITT BVCF                | 95/97                                  | 2.3 (1.7, 2.8)                                | 1.7 (1.1, 2.3)                                | -0.7 (-1.5, 0.2)                               | -0.6 (-1.6, 0.3)                               |
| PP                      | 66/68                                  | 1.6 (1.1, 2.1)                                | 0.9 (0.5, 1.2)                                | -0.8 (-1.4, -0.1)                              | -0.8 (-1.2, -0.3)                              |

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Supplemental material

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### Discomfort due to mechanical symptoms last 7 days (scale 0-10)

| Scale | ITT BVCF | PP |
|-------|----------|----|
| Lowest rating | 1.3 (0.9, 1.6) | 1.1 (0.7, 1.6) |
| Highest rating | 3.0 (2.4, 3.6) | 2.2 (1.6, 2.8) |
| Average rating | 2.6 (1.9, 3.3) | 1.6 (1.0, 2.3) |

### Patient-Specific Functional Scale (scale 0-10)

| Scale | ITT BVCF | PP |
|-------|----------|----|
| Lowest rating | 5.4 (4.7, 6.1) | 5.7 (5.0, 6.5) |
| Highest rating | 6.1 (5.4, 6.9) | 6.0 (5.1, 6.9) |
| Average rating | 33.1 (29.6, 36.6) | 30.1 (26.8, 33.4) |

### Checklist Individual Strength (scale 8-56)

| Scale | ITT BVCF | PP |
|-------|----------|----|
| Lowest rating | 14.3 (13.1, 15.5) | 12.9 (11.7, 14.1) |
| Highest rating | 22.4 (20.7, 24.1) | 20.4 (18.8, 22.0) |
| Average rating | 21.5 (19.6, 23.4) | 19.6 (17.9, 21.3) |

### COOP/WONCA (scale 6-30)

| Scale | ITT BVCF | PP |
|-------|----------|----|
| Lowest rating | 13.1 (11.7, 14.5) | 11.4 (10.5, 12.4) |
| Highest rating | 22.4 (20.7, 24.1) | 20.4 (18.8, 22.0) |
| Average rating | 21.5 (19.6, 23.4) | 19.6 (17.9, 21.3) |

### Tampa Scale of Kinesiophobia, (scale 11-44)

| Scale | ITT BVCF | PP |
|-------|----------|----|
| Lowest rating | 0.74 (0.70, 0.78) | 0.79 (0.76, 0.83) |
| Highest rating | 0.78 (0.74, 0.81) | 0.83 (0.80, 0.87) |
| Average rating | 0.74 (0.70, 0.78) | 0.79 (0.76, 0.83) |

### EQ-5D-5L, (scale <0-1)

| Scale | ITT BVCF | PP |
|-------|----------|----|
| Lowest rating | 68.8 (63.7, 73.9) | 74.4 (69.7, 79.2) |
| Highest rating | 73.4 (68.2, 78.6) | 80.6 (76.9, 84.4) |
| Average rating | 68.8 (63.7, 73.9) | 74.4 (69.7, 79.2) |

### EQ-VAS (scale 0-100)

| Scale | ITT BVCF | PP |
|-------|----------|----|
| Lowest rating | 71.5 (66.6, 76.4) | 69.6 (65.1, 74.1) |
| Highest rating | 78.9 (70.0, 81.8) | 68.1 (62.5, 73.8) |
| Average rating | 71.5 (66.6, 76.4) | 69.6 (65.1, 74.1) |

### Secondary objective outcomes

#### Range of motion (°)

| Scale | ITT BVCF | PP |
|-------|----------|----|
| Internal rotation passive | 103.7 (96.2, 111.2) | 107.2 (100.8, 113.5) |
| Internal rotation active | 103.7 (96.2, 111.2) | 107.2 (100.8, 113.5) |
| External rotation passive | 103.7 (96.2, 111.2) | 107.2 (100.8, 113.5) |
### External Rotation Active

|           | ITT BVCF | PP  |
|-----------|----------|-----|
| 87/90     | 99.2 (92.7, 105.7) | 100.9 (100.0, 113.5) |
| 63/66     | 104.9 (99.8, 110.1) | 106.7 (100.0, 113.5) |

### Isometric Shoulder Torque Strength (Nm/kg)

|                  | ITT BVCF | PP  |
|------------------|----------|-----|
| Scaption 87/90   | 0.46 (0.41, 0.52) | 0.56 (0.47, 0.64) |
| 63/66            | 0.51 (0.44, 0.59) | 0.38 (0.32, 0.45) |

### Proprioception in Flexion (error °)

|                  | ITT BVCF | PP  |
|------------------|----------|-----|
| Low range 87/90  | 4.6 (3.8, 5.4) | 4.8 (3.9, 5.7) |
| 63/66            | 4.5 (3.5, 5.5) | 5.1 (3.8, 6.5) |

### Shoulder Instability and Laxity Tests (positive %)

|                  | ITT BVCF | PP  |
|------------------|----------|-----|
| Shoulder flexion test, positive = yes 87/90 | 72 (58, 83) | 62 (48, 74) |
| 63/66            | 79 (65, 93) | 61 (44, 78) |

### Shoulder Rotation Test, Positive >180°

|                  | ITT BVCF | PP  |
|------------------|----------|-----|
| 87/90            | 54 (40, 67) | 42 (29, 56) |
| 63/66            | 62 (45, 79) | 40 (23, 57) |

### Apprehension Test, Positive = yes

|                  | ITT BVCF | PP  |
|------------------|----------|-----|
| 87/90            | 72 (58, 83) | 64 (50, 76) |
| 63/66            | 64 (47, 80) | 65 (49, 82) |

### Relocation Test ||, positive = yes

|                  | ITT BVCF | PP  |
|------------------|----------|-----|
| 87/90            | 56 (42, 69) | 44 (31, 58) |
| 63/66            | 52 (34, 70) | 48 (30, 65) |
### Release test, positive = yes

|                  | ITT BVCF | PP  |
|------------------|----------|-----|
| **ITT BVCF**     | 87/90    | 63/66 |
| Load and shift anterior, positive 2-3 | 68 (54, 79) | 65 (49, 82) |
| **ITT BVCF**     | 87/90    | 63/66 |
| Load and shift posterior, positive 2-3 | 68 (54, 79) | 65 (49, 82) |
| Sulpus sign, positive >1 cm | 87/90 | 63/66 |
| Gagey, positive >105° | 87/90   | 63/66 |
| Rotés Queról, positive > 90° | 87/90  | 63/66 |

Global Perceived Effect ‡ § (% rated important effect postintervention)

|                  | ITT BVCF | PP  |
|------------------|----------|-----|
| PP               | 50 (36, 64) | 42 (25, 59) |
| Sports/recreation/work | 68 (54, 79) | 65 (49, 82) |
| Lifestyle        | 87/90    | 63/66 |
| Emotions         | 50 (36, 64) | 42 (25, 59) |

* For BVCF, there were 100 possible assessments for each group (50 at baseline and 50 at 16 weeks follow-up), except for Global Perceived Effect, which had 50 possible assessments for each group. For per protocol, there were 66 and 68 possible assessments for LIGHT and HEAVY, respectively, except for Global Perceived Effect which had 33 (LIGHT) and 34 (HEAVY) possible assessments.

† The results are adjusted for baseline score, age, sex, and the clustering of physiotherapy clinic

‡ No data imputation

§ Proportions of a positive test in % (95% CI) and odds ratio (OR) for between-group differences with group LIGHT as reference.

### Abbreviations

- CI, Confidence Interval
- CIS, Checklist Individual Strength
- COOP/WONCA, Dartmouth Primary Care Cooperative Research Network/World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians
- EQ-5D-5L, European Quality of Life - Five Dimensions – Three Level
- NPRS, Numeric Pain Rating Scale
- VAS, Visual Analogue Scale
- WOSI, Western Ontario Shoulder Instability Index

Statistically significant results (p<0.05) are marked with bold.
## Supplementary file 4. Table. Outcomes at 16-week follow-up for HEAVY and LIGHT.

|                  | Total no. of assessments (LIGHT/HEAVY) * | Mean at 16 weeks in LIGHT (95% CI) n = 50 | Mean at 16 weeks in HEAVY (95% CI) n = 50 | Between-Group difference at 16 weeks (crude risk ratio) (95% CI) | Between-Group difference at 16 weeks (adjusted risk ratio) † (95% CI) |
|------------------|-----------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| Shoulder instability and laxity tests (positive %) § |                                         |                                           |                                           |                                                               |                                                               |
| Shoulder flexion test, positive = yes                  | 87/90                                   | 78 (64, 91)                               | 62 (47, 76)                               | 0.79 (0.49, 1.29)                                              | 0.84 (0.62, 1.14)                                              |
| Shoulder rotation test, positive >180°                 | 87/90                                   | 62 (47, 76)                               | 42 (28, 56)                               | 0.68 (0.38, 1.19)                                              | **0.68 (0.49, 0.95)**                                          |
| Apprehension test, positive = yes                      | 87/90                                   | 70 (55, 85)                               | 62 (48, 76)                               | 0.89 (0.55, 1.44)                                              | 0.86 (0.69, 1.06)                                              |
| Relocation test||, positive = yes                      | 87/90                                   | 55 (38, 72)                               | 44 (30, 58)                               | 0.81 (0.45, 1.45)                                              | 0.78 (0.60, 1.01)                                              |
| Release test||, positive = yes                      | 87/90                                   | 50 (32, 68)                               | 37 (23, 51)                               | 0.74 (0.40, 1.38)                                              | 0.74 (0.48, 1.16)                                              |
| Load and shift anterior, positive 2-3                  | 87/90                                   | 68 (52, 84)                               | 62 (47, 77)                               | 0.91 (0.55, 1.51)                                              | 0.84 (0.66, 1.06)                                              |
| Load and shift posterior, positive 2-3                 | 87/90                                   | 28 (13, 44)                               | 18 (7, 29)                                | 0.65 (0.27, 1.57)                                              | 0.73 (0.32, 1.67)                                              |
| Sulcus sign, positive >1 cm                           | 87/90                                   | 84 (68, 93)                               | 85 (70, 93)                               | 1.00 (0.64, 1.55)                                              | 1.00 (0.82, 1.23)                                              |
| Gagey, positive >105°                                 | 87/90                                   | 92 (85, 100)                              | 90 (78, 100)                              | 0.97 (0.64, 1.47)                                              | 0.95 (0.84, 1.07)                                              |
| Rotés Querol, positive > 90°                          | 87/90                                   | 63 (48, 77)                               | 55 (41, 69)                               | 0.88 (0.52, 1.47)                                              | 1.00 (0.78, 1.28)                                              |
| Global Perceived Effect ‡ §                           |                                         |                                           |                                           |                                                               |                                                               |
| (% rated important effect postintervention) Physical symptoms | 45/47                                   | 44 (31, 59)                               | 64 (49, 76)                               | 1.44 (0.82, 2.53)                                              | **1.46 (1.06, 2.01)**                                          |
| Sports/recreation/work                                 | 45/47                                   | 38 (25, 53)                               | 51 (37, 65)                               | 1.35 (0.73, 2.52)                                              | 1.36 (0.90, 2.06)                                              |
| Lifestyle                                            | 45/47                                   | 44 (31, 59)                               | 55 (41, 69)                               | 1.24 (0.69, 2.23)                                              | 1.26 (0.78, 2.03)                                              |
| Emotions                                             | 45/47                                   | 40 (27, 55)                               | 51 (37, 65)                               | 1.28 (0.69, 2.35)                                              | 1.27 (0.70, 2.30)                                              |

* There were 100 possible assessments for each group (50 at baseline and 50 at 16 weeks follow-up), except for Global Perceived Effect which had 50 possible assessments for each group.

† The results are adjusted for baseline score of the variable of interest, age, sex, and the clustering around clinic.

‡ No data imputation

§ Proportions of positive test in % (95% CI) and risk ratio for between-group differences with group LIGHT as reference.

|| Relocation and release tests were only performed on patients with a positive apprehension test.

Abbreviations: CI, Confidence Interval; CIS, Checklist Individual Strength; COOP/WONCA, Dartmouth Primary Care Cooperative Research Network/World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians; EQ-5D-5L, European Quality of Life - Five Dimensions – Three Level; NPRS, Numeric Pain Rating Scale; VAS, Visual Analogue Scale; WOSI, Western Ontario Shoulder Instability Index.

Statistically significant results (p<0.05) are marked with bold.
### Supplementary file 5. Table. Adverse Events (specific, serious or minor, and withdrawals due to adverse events), and crude difference between risks and medians were calculated with 95% Confidence Intervals based on the “per protocol” data while still respecting the original group allocation, from baseline to 16-week follow-up for HEAVY vs LIGHT in patients with hypermobility spectrum disorder and shoulder complaints.

| Adverse events | LIGHT (n = 33) | HEAVY (n = 34) | Between-Group Risk Difference or Median difference with 95% CI (unadjusted) |
|----------------|---------------|---------------|-------------------------------------------------------------------------|
| Number of patients reporting serious adverse events* | 0 (0) | 0 (0) | 0 (0, 0) |
| Number of patients reporting minor adverse events (n (%)) | 20 (61) | 21 (62) | 1 (-22, 24) |
| Index shoulder | 15 (45) | 17 (50) | 5 (-19, 28) |
| - Muscle soreness | 2 (6) | 1 (3) | -3 (-13, 7) |
| - Shoulder is locked | 3 (9) | 1 (3) | -6 (-17, 5) |
| - Subluxation | 0 (0) | 1 (3) | 3 (-3, 9) |
| - Dislocation | 6 (18) | 5 (15) | -3 (-21, 14) |
| Other sites than index shoulder | 6 (18) | 11 (32) | 14 (-6, 35) |
| “Other” minor events related to index shoulder or other sites | 14 (42) | 13 (38) | -4 (-28, 19) |
| Number of minor adverse events (median, 95% CI) † | 1 (0, 4.3) | 2 (0, 3.2) | 1 (-0.6, 2.6) |
| Index shoulder | 0 (0, 1) | 0.5 (0, 2) | 0.5 (-0.04, 1.04) |
| - Muscle soreness | 0 (0, 0) | 0 (0, 0) | 0 (0, 0) |
| - Shoulder is locked | 0 (0, 0) | 0 (0, 0) | 0 (0, 0) |
| - Subluxation | 0 (0, 0) | 0 (0, 0) | 0 (0, 0) |
| - Dislocation | 0 (0, 0) | 0 (0, 0) | 0 (0, 0) |
| - Persistent worsening of symptoms | 0 (0, 0) | 0 (0, 0) | 0 (0, 0) |
| Other sites than index shoulder | 0 (0, 0) | 0 (0, 0) | 0 (0, 0) |
| “Other” minor events related to index shoulder or other sites | 0 (0, 0) | 0 (0, 0) | 0 (0, 0) |

This table includes all adverse events that occurred during the 16-week study period, but which did not necessarily have a causal relationship with the treatment administered. *Serious adverse events are unexpected but cover death, life-threatening events, disability, and permanent damage.

† For each patient, each adverse event could count 0 to 16 times corresponding with the 16-week intervention period.
**Supplementary file 6. Table.** The adjusted (age, sex, clustering around clinic) risk difference using margins after fitting a logistic regression model for adverse events with 95% Confidence Intervals based on the ‘as observed’ data while still respecting the original group allocation, from baseline to 16-week follow-up for HEAVY vs LIGHT in patients with hypermobility spectrum disorder.

| Adverse events                          | LIGHT (n = 46) | HEAVY (n = 45) | Model-based standardisation: Between-group risk differences adjusted for age, sex, and cluster by clinics |
|----------------------------------------|----------------|----------------|---------------------------------------------------------------------------------|
| Number of patients reporting minor adverse events (n %) | 24 (52)        | 29 (64)        | 12 (-6, 29)                                                                      |
| Index shoulder                         |                |                |                                                                                 |
| - Muscle soreness                      | 17 (37)        | 25 (56)        | 18 (-5, 42)                                                                      |
| - Shoulder is locked                   | 3 (4)          | 2 (4)          | -2 (-10, 5)                                                                      |
| - Subluxation                          | 3 (7)          | 1 (2)          | -5 (-10, 0)                                                                      |
| - Dislocation                          | 0 (0)          | 1 (2)          | Not possible due to no events in the LIGHT group                                 |
| - Persistent worsening of symptoms     | 8 (17)         | 8 (18)         | 0 (-20, 21)                                                                      |
| Other sites than index shoulder        |                |                |                                                                                 |
| - Headache                             | 9 (20)         | 18 (40)        | 20 (-2, 42)                                                                      |
| “Other” minor events related to index shoulder or other sites | 18 (39)        | 19 (42)        | 2 (-27, 31)                                                                      |

This table includes all adverse events that occurred during the 16-week study period but did not necessarily have a causal relationship with the treatment administered.