

ONLINE SUPPLEMENTARY DATA

Supplementary Data 1. Description of each performance-based measure within iBASFI. Detailed description of each performance-based measure in the instrumented Bath Ankylosing Spondylitis Functional Index is given below. Please consult Figure 1 in the main article for a visual representation:

1) *Sock test:* the subjects were seated on a treatment table, of which the height was standardized by setting the knee angle at 90°. The edge of the table was positioned in the middle between the trochanter major and the lateral epicondyles of the femur. The socks were positioned 10 cm outwards on each side of the subject. The subjects were asked to put on their own socks without any help or aids at their own pace while sitting, starting with the sock on the side of the dominant hand. The chronometer was stopped when the second sock exceeded the upper side of the lateral malleolus of the non-dominant side.

2) *Pen test:* a pen was placed in front of the subject at a distance of 20 cm from the distal end of the big toe on the dominant side. The subjects were asked to bend forward from the hips to pick up the pen at their own pace without any help or aids. They were also instructed to drop the pen in a box at the dominant side, once their backs were fully flattened against the rater's hand when returning upright. The chronometer was stopped when the subjects touched the hand of the rater.

3) *Pen speed test:* the subjects were standing in front of a wooden box with a height of 15 cm, at a distance of 20 cm from the distal end of the big toe. Five pens were placed parallel on the box, one centimetre apart with the middle pen lying in the extension of the big toe on the dominant side. The subjects were asked to bend forward from the hips to pick up the pens one by one, as quickly as possible, starting with the left pen. The pens were dropped in a box at the dominant side, once the subjects' backs were fully flattened against the rater's hand, when returning upright. The chronometer was stopped when the subjects touched the rater's hand for the fifth time.

4) *Maximal reach test:* the subjects were placed in front of a vertical bar, at a distance of 50 cm from the distal end of the big toe. The subjects were asked to reach as high as possible on the vertical bar, using their dominant arm, without any help or aids and at their own pace. They were allowed to take a step forward, but not to stand on tiptoe. The chronometer was stopped when the subjects had reached their highest point. The rater recorded both the highest reaching point and the horizontal distance between the big toe and the base of the vertical bar.

5) *Shoulder speed test:* the subjects were placed in front of a vertical bar, at a fixed distance. This distance corresponded with the horizontal distance between the big toe and the base of the vertical bar, as measured during the best of both attempts (attempt with the highest reach point, in cm). The subjects were asked to tap the marked point on the vertical bar five times, as fast as possible, with their dominant hand (target height = ((maximal reach height – middle finger to floor)*75%) + middle finger to floor). The subjects started with both hands on their thighs and were asked to return to this position after every tap. The feet had to remain

stationary. The chronometer was stopped when the subjects had touched the specified point for the fifth time.

6) *Sit-to-stand test*: the subjects were seated on a treatment table, of which the height was standardised by setting the knee angle at 90°. The edge of the table was positioned in the middle between the trochanter major and the lateral epicondyles of the femur. The subjects were asked to cross both arms, with the right arm below the other. It was also enquired to keep the arms still against the trunk during the entire test. The subjects were instructed to stand up at their own pace without any help or aids. The chronometer was stopped when both knees and hips stood still (both hips and knees being fully extended was not a requirement).

7) *Sit-to-stand speed test*: the same starting position as the sit-to-stand test was used. The subjects were asked to stand up five times, as fast as possible, without any help or aids. Once standing upright for the fifth time, they were instructed to remain stationary without returning to sit. The chronometer was stopped when both knees and hips stood still after the fifth time standing (both hips and knees being fully extended was not a requirement).

8) *Lying down test*: the subjects were asked to stand in front of a mat (182 x 100 cm), on which a cushion (possibly several) was placed. The subjects were instructed to lay down in supine, with their head on the cushion, without any help. The chronometer was stopped when the head made contact with the cushion.

9) *Getting up test*: at the start of the test, the subjects were lying in supine on the mat. The subjects were asked to stand up without any help or aids. The chronometer was stopped when the subject was fully upright, with both knees and hips standing still (both hips and knees being fully extended was not a requirement).

10) *Stair test*: the subjects were standing in front of a staircase with thirteen steps (16 cm). The subjects were instructed to climb up the stairs, using only one foot for each step, at their own pace and without any help or aids (not even the handrail). The chronometer was stopped once the second foot made contact with the upper step.

11) *Cervical rotation*: the subjects were positioned on a crutch with their backs facing the vertical bar. The height of the crutch was standardised by setting the knee angle at 90°. A large goniometer was hung on the vertical bar above the head of the subjects. The rotation-axis C1-C2 was aligned with the rotation-axis of the goniometer. The subjects were instructed to rotate their heads as far as possible. First, the subjects rotated their head to one side twice. Subsequently, this was repeated to the other side. Which side to rotate to first, was counterbalanced between subjects. The rater measured the degree of rotation with the goniometer at both sides.

Supplementary Data 2. Overview of items for different instrumented Bath Ankylosing Spondylitis Functional Index (iBASFI) stages of development.

Development set of performance-based tests (items) for iBASFI	
1.	Sock test (seconds)
2.	Pen test (seconds)
3.	Pen speed test (seconds)
4.	Maximal reach test (cm)
5.	Height (cm)
6.	Weight (kg)
7.	Reach test (seconds)
8.	Shoulder speed test (seconds)
9.	Sit-to-stand test (seconds)
10.	Sit-to-stand speed test (seconds)
11.	Lying down test (seconds)
12.	Getting up test (seconds)
13.	Stair test (seconds)
14.	Cervical rotation (degrees)

Final set of reliable performance-based tests (items): extensive iBASFI	
1.	Sock test (seconds)
2.	Pen speed test (seconds)
3.	Height (cm)
4.	Weight (kg)
5.	Pen speed test (seconds)
6.	Sit-to-stand speed test (seconds)
7.	Lying down test (seconds)
8.	Getting up test (seconds)
9.	Stair test (seconds)
10.	Cervical rotation (degrees)

Final proof of concept reduction of performance-based tests (items): core set iBASFI	
1.	Height (cm)
2.	Sit-to-stand speed test (seconds)
3.	Cervical rotation (degrees)