**The authors’ responses to editorial and reviewers’ comments**

**We marked all changes in the revised manuscripts in this color, for your convenience.**

**Editorial comments:**

1. Please take this opportunity to thoroughly proofread the manuscript to ensure that there are no spelling or grammar issues.

We finally proof read the document.

2. Please note that numbering of institutional affiliation should follow the order of authors. First author gets 1, next author with different affiliation gets 2, etc., following from first to last.

We appreciate this remark and have changed the order accordingly.

3. JoVE cannot publish manuscripts containing commercial language. This includes trademark symbols (™), registered symbols (®), and company names before an instrument or reagent. Please remove all commercial language from your manuscript and use generic terms instead. All commercial products should be sufficiently referenced in the Table of Materials and Reagents. You may use the generic term followed by “(see table of materials)” to draw the readers’ attention to specific commercial names. Examples of commercial sounding language in your manuscript are: formetric 4D, Diers International GmbH, Ergo-Run, Daum Electronic GmbH, Zebris medical®, Canon, MathWorks®, MATLAB, IBM, etc.

All commercial language has been erased from the manuscript.

4. Please adjust the numbering of the Protocol to follow the JoVE Instructions for Authors. For example, 1 should be followed by 1.1 and then 1.1.1 and 1.1.2 if necessary. Please refrain from using bullets, dashes, or indentations.

The numbering of the protocol has been adjusted exactly according to the Instructions for authors. The automatic indentations Microsoft Word is using for numbering have been erased.

5. Please revise the protocol to contain only action items that direct the reader to do something (e.g., “Do this,” “Ensure that,” etc.). The actions should be described in the imperative tense in complete sentences wherever possible. Avoid usage of phrases such as “could be,” “should be,” and “would be” throughout the Protocol. Any text that cannot be written in the imperative tense may be added as a “Note.” Please include all safety procedures and use of hoods, etc.

However, notes should be used sparingly and actions should be described in the imperative tense wherever possible.

We changed the protocol accordingly.

6. Lines 116-124, 148-157: The Protocol should contain only action items that direct the reader to do something. Please revise or include them as Note. Please move the discussion about the protocol to the Discussion.

We adapted the protocol and added relevant notes-sections.

7. Please add more details to your protocol steps. There should be enough detail in each step to supplement the actions seen in the video so that viewers can easily replicate the protocol. Please ensure you answer the “how” question, i.e., how is the step performed? Alternatively, add references to published material specifying how to perform the protocol action. See examples below.

We appreciate this remark and have performed the necessary changes.

8. Line 125: Where and how is the plain black background added?

Changed. Protocol C.2.

9. Line 135: Please add more specific details (e.g. button clicks for software actions, numerical values for settings, etc.).

As the protocol should not include details about the commercial software used it is difficult and also far-fetched to give specific details about software actions. This is even more so the case as the setup of keyboards varies across the globe significantly. We have, however, now added the information that the steps performed are according to the manufacturer's instructions provided with the software. Should a specific work-flow be required to draft the filming process, we can - of course - provide the necessary information. We would suggest, however, that we provide this information in the form of a flow diagram.

10. Line 136: Selecting the landmarks on the software? Please specify.

We now specified the landmarks under that subsection as suggested.

11. Please include single-line spaces between all paragraphs, headings, steps, etc.

Changed accordingly.

12. After you have made all the recommended changes to your protocol (listed above), please highlight 2.75 pages or less of the Protocol (including headings and spacing) that identifies the essential steps of the protocol for the video, i.e., the steps that should be visualized to tell the most cohesive story of the Protocol.

The essential steps are highlighted in yellow.

13. Please highlight complete sentences (not parts of sentences). Please ensure that the highlighted part of the step includes at least one action that is written in imperative tense.

We have changed the highlighting accordingly. There is now at least one action per step that is written in imperative tense.

14. Please include all relevant details that are required to perform the step in the highlighting. For example: If step 2.5 is highlighted for filming and the details of how to perform the step are given in steps 2.5.1 and 2.5.2, then the sub-steps where the details are provided must be highlighted.

All necessary steps for filming are highlighted.

15. Please combine all panels of one figure into a single image file.

All images are now combined.

16. Figures: Please define error bars in the figure legend.

We extended the legends as appropriate.

17. Figure 1A: Figure shows 3 months while figure legend states one-year follow up. Which is correct?

We changed the misleading legend.

18. Figure 2B-D: Please explain what “>75”, “30-74”, “<30”, “>1 yr” and “control” represent. It is unclear.

We added the needed explanation to the figure legend.

19. Please remove trademark (™) and registered (®) symbols from the Table of Equipment and Materials.

We removed the trademark / registered signs.

**Reviewers' comments:**

**Reviewer #1:**

Manuscript Summary:

The Abstracts were well written.

Thank you.

Major Concerns:

Under the section of representative results, the authors stated their hypothesis. However, I did not see any rationale in the introduction that led to this hypothesis. The introduction only provided the reasons for the new protocol. It did not provide any rationale for expecting a correlation between the gait and posture pattern changes and pain levels. Please expand your introduction provide the information that led to this hypothesis.

Thank you for pointing that out. We added the relevant details to the introduction.

Minor Concerns:

Lines 63-65 - "So far, monitoring and ..." : Please add a reference to this statement.

A relevant reference has been added to this section.

Line 95: You mentioned there is not limit to age. Does that mean you were open to recruit children? If not, please mention the lower age limit such as 18 or 21.

We changed that section and added the age limitation to protocol A.1..

Is it practically possible to do this protocol in a clinical setting by clinicians everyday? How long will take to test each patient?

We used that protocol on a daily base in a clinical setting. We trained our nurses to do the measurement with the patients. The measurements take approx. 20 minutes for each patient including preparation time. The analysis of the values is done in 1-2 Minutes. The interpretation is, however, indeed somewhat more challenging. The use of this set-up is therefore rather suited for scientific purposes.

Other comments:

Lines 259 - 263: This is an interesting point.

**Reviewer #2:**

Manuscript Summary:

The authors present a protocol about two different methods, video rasterstereography and treadmill gait analysis, to assess patients after lumbar fusion surgery. The use of such methods is important as it reduces the subjectivity of the evaluation. However, as mentioned by the authors, it may not be so easy to use for every clinical visit. Some results are presented from previous recent publication. The suggested protocol is interesting and has some clinical relevance.

Major Concerns:

-Although the protocol description can be useful for researchers and clinicians, some major concerns should be addressed before being considered for publication.

In a general view, I believe that more details are needed, but it is also possible that the steps in the experimental design will be more evident in the video.

Definition of the outcomes (mainly from gait analysis), their computation and interpretation are needed as new users of such analysis can understand its application.

-Based on the short abstract: "To enhance accuracy and reliability of indication for surgery, critical postoperative evaluation on a less subjective level is required", it seems that the reliability and accuracy were tested but instead the presented results should only comparison without many explanations about that.

We thank the reviewer for pointing out this inconsistency. We have tried to rephrase it in a fashion, that the main study intention becomes more visible. The reliability and accuracy of the back surface and gait measurements were not tested in this study. There are particular publications available that we cited in our introduction who point out the accuracy of the used methods. The aim of this study was to correlate the decrease in the levels of pain and changes in posture and gait by means of back surface and gait measurements. This has now been pointed out in the text.

Based on the long abstract, it is concluded that "the video rasterstereography is best suited to examine long term alterations in posture." Please, which measure based on the current analyses were more reliable using such protocol? How did the authors reach such conclusion in the long abstract? In the discussion section of the text, this conclusion does not seem to be clear.

Thank you for this advice. We have therefore revised the wording of the long abstract, as it was misleading. In this study we did not compare different measurement methods, so we cannot answer the question for reliability.

Please, clarify.

-L.171 6.1. If necessary, the slope can be adjusted in a range from -2% to +15% in 0.5% increments. The authors should justify the "need" of slope adjustment in the protocol.

For this protocol an adjustment of the slope is not needed, as written. But as there is the option of slope-adjustment in many commercial treadmills we tried to be explicit on that point. We added a short explanation for the optional slope adjustment under D.Notes.6..

-L. 201 "1.1. Assess normality by using histograms and equality of variances by using the Levene test." Why is it suggested assessing normality only by histograms? Few tests could also be used to check normality. This suggestion for the specific protocol seems to be biased by the author's preference.

The Shapiro-Wilk or Kolmogorov-Smirnoff (which are the commonly used tests to evaluate normality) only can tell the researcher if the assumption of normality has to be rejected (usually on a 0.05 bases). This is, however, far from providing information about whether the data can actually be considered as being normally distributed. In our opinion, for the experienced statistician it would therefore be scientifically more correct to evaluate the actual data distribution visually. Additionally, in the decision making process as to whether or not the data are normally distributed deliberations have to be integrated if the parameter in question possesses the characteristics of a normal distribution or if certain circumstances strongly argue against it. To make this decision making process more accessible we have now additionally mentioned the Shapiro-Wilk and K-S test.

-L. 213 3. Interpret the Oswestry Disability Index (ODI) according the questionnaire's instructions Please, this is too vague. Some specific description of the interpretation of the results from the ODI should be added.

We thank the reviewer for this suggestions. We have now added the interpretation for the ODI under E.Notes.

-L.212 2.1. Consider 30% or less of improvement of pain as no improvement. Please, justify the criteria to define improvement. It is possible that 30% for a specific patient is a large relieve.

We appreciate this remark and have now provided all the necessary information. We agree with the reviewer that a 30% improvement can be a major relief for the patient. The 30% level is only used when ordinally scaling improvement, which is now clearly stated in the manuscript. A 30% improvement can also be obtained just by a placebo effect (reference now provided). Since it is impossible to distinguish those patients with actual pain improvement of about 20% accompanied by also functional improvement from those with just improvement due to the placebo effect where we would not expect functional changes we have classified this group as "no improvement". We added the relevant information and reference under E.Notes.2..

-L. 228 Only the P-values are not enough to the readers and users of the protocol to understand the significance of the findings. Please, add the name of the test and its value so the reader can also understand which statistical analysis was run for each outcome.

We added the relevant test and values.

Figures: All legends should be rewritten. The lack of details in both legends and text makes hard to understand. The legends should be similar to previous publication (Scheidt et al., 2018).

We adapted the legends after rearranging the Figures.

Minor Concerns:

-L.162 4. Ask the subject to stand on the treadmill barefoot and with the pants rolled up to the knees. Why did the participants wear shorts?

We performed measurements on patients attending our ward for their regular consultation. Since they had not been instructed to bring shorts, we measured patients with rolled up pants, so that the feet were free and the trousers were not disturbing the examination.

-L.182 "10. For every subject measure two runs with a duration of 20 seconds." Does run mean trial? Please, change.

Thank you for pointing that out. We changed the text accordingly.