Reviewer's report

Title: SEAS (Scientific Exercises Approach to Scoliosis): a modern neurophysiological evidence based approach to exercises for idiopathic scoliosis

Version: 3 Date: 19 February 2014

Reviewer: Eric Parent

Reviewer's report:

This thematic series article remains a description of a scoliosis specific exercise approach for Scoliosis.

1. Is the question posed by the authors new and well defined?
   This is a description of the exercise approach and as such the intent is clear. I wish it also included more details on the literature review.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?
   The description of the method is remains at very high level. I continue recommending providing significantly more details. This will improve the value for the readers.

3. Are the data sound and well controlled?
   --There are no research results presented that are new for this thematic series article.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   -description of approaches don't match a clear typical reporting format I am familiar with the flow is ok but I make a few suggestions below..

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   - This does not really apply in this case. Authors added a conclusion but a discussion comparing the characteristics of the SEAS approach to other scoliosis-specific approaches would be relevant.

6. Do the title and abstract accurately convey what has been found?
   - Yes

7. Is the writing acceptable?
   The paper should be significantly reviewed for adequate English language throughout. I make some recommendations but English is a second language for me as well. There has not been major improvements in language since the last submission.
Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)

I do not comment on minor English corrections but the authors should ensure review of the whole manuscript by an English native.

In the abstract: I continue to recommend adding the following key characteristics to the rehabilitation program section: Patients for which the approach is indicated; goals pursued; program dose in terms of (Specify duration in terms of months, years or in relation to skeletal maturity; session durations).

My comment from the previous review has not been addressed. Intro paragraph 1: You refer to most-qualified (you seem to mean most influential?) European centers: On what basis can the qualification be judged. It would be just as meaningful to simply list the specific centers having influenced the developers. Please refer to specific centers or Clinicians/ researchers having had influence. Rather than refer to prestige and reputation of consulted colleagues it would be more convincing to refer to their data, evidence….or in absence of the latter possibly to their offering lectures and courses or visits to discuss their approach.

Intro. In listing the basic characteristics of the Lyon approach adopted consider using an action verb for each item.

Page 2 Similarly, define what you mean by “counteract spinal collapse.

P3 (SEAS exercise) Please explain/summarize the citations you provided in response to my comment below. (There is theory and research evidence supporting some of the ideas SEAS is using to facilitate the involuntary integration of the correct posture.)

Page 3 (objective 1) Please define what are the targeted functions? The description remain vague without knowing typically what is evaluated in a SEAS exam, I wonder if there is a list of functional task that are a primary focus of the evaluation and then of the intervention afterward. If it is wide open. How are therapists trained to decide what to assess and what to treat to standardize the delivery of SEAS?

The following was not adequately addressed: “The evolution of unstable scoliosis always runs toward a worsening condition.” I now understand what you mean and recommend (progressive or evolutive scoliosis rather than unstable”.

The following was not adequately addressed: “I don’t agree with the use of maintain stability; it seems stability is used here in lieu of physiological alignment and biomechanically symmetrical distribution of forces rather than segmental instability. “The asymmetrical distribution of the load and the progressive deformation of the vertebrae gradually decrease the spinal column’s capacity to maintain stability.” Similarly in the following sentence clarifying the use of the terms destabilization and imbalance (do you mean risk of falling or asymmetrical load distribution) would be beneficial.” Instead, I recommend referring specifically to the ability to maintain corrected spinal alignment.

An overview of how SEAS as a program is implemented may be best introduced
in the introduction after the principles but before the exercises and the questions. Content may not need to be added simply moved earlier from the protocol section to clarify for the reader that the SEAS approach consists of: Evaluation, teach exercise, family education, home program and follow-up strategy.

A description of for which patients it is indicated to use SEAS Should be provided. It should not be implicit is should be stated. Somewhere the paper should explain how the approach is modified for each categories of patients if relevant.

The following comment has not been adequately assessed: “The evaluation description on page 3 and page 8 should be more specific. SEAS’s prescription is directly related to the assessment.” A clear description of the assessment strategy is therefore very important. Without having to detail all tests as in a manual, you could specify “How long is the evaluation? How does the therapist pick the most relevant elements from the broad list of evaluation tests listed? Specify if there is guidance on which tests to use. How do the therapist weight the information retrieved: eg flexibility, vs balance vs strength…?

To complement 13 above: One particularity of the SEAS approach is its integration of neuromotor evaluation and training. Please describe how neuromotor impairments are detected? Which ones are assessed and how?

The following has not been addressed: In describing the teaching of the exercises, I recommend first explaining how the exercises are taught and then introduce the questions used to self-appraise performance. (or introduce both together). At the moment, when the questions are introduced the reader does not know quite enough about the exercise progression to fully understand. This comment does not require more length simply reorder the description of exercises so that it appears before the questions so that the questions become meaningful to the readers without having to back track once they learn about the exercises.

You have illustrated a basic and an advance exercises. I recommend expanding the examples to illustrating how exercise progressions are selected. Specifically you could summarize which exercise would come before or after the illustrated examples and explain how a therapist is to decide on how to progress the patients to the next exercises. This would address “ How are decisions made every 3 months to change an exercises or progress its difficulty? Are certain impairment targeted before others? (Does SEAS challenge flexibility before strength, before endurance before balance control…..”

The following has not been addressed: P6-7. You suggest that the exercises have a bias towards self-correction in the frontal plane in the basic example and towards the transverse and sagittal plane in the advance exercise case. You should clarify how the therapist is to choose the bias selected in instructing the patients in self-correction. Without providing more details it is hard for the reader to understand how SEAS is implemented and different from other methods using self-corrections. Simply listing factors considered to influence the therapists selection of the priority correction may be good.
This page contains feedback on the document, with suggestions for revisions, clarifications, and improvements. The feedback is detailed, covering various aspects of the text, from section aims and vague descriptions to the need for clearer definitions and more detailed information.

The feedback indicates that several sections and aspects of the document require attention. For instance, the test aims sections are somewhat vague and redundant. The feedback suggests providing more details about the key components of the SEAS approach. The strengths paragraphs need consideration for reporting criteria and progression from simple to complex. The literature section result is too vague, and a summary table summarizing the studies is suggested. Additionally, the feedback points out the need for more details about the targeted outcomes, study designs, and patient characteristics influencing progression.

The feedback concludes with minor essential revisions, such as correct usage of terms and figures, and removal of indexing emphasis.
Ok

Page 6. (Under Scheduled tests aim:) how is the 2nd item different from the 4th?.

19 to 23 OK

This comment has not been addressed: P5 Please replace contrast postural collapse by a better term. Schroth for example use expand compressed/concave areas. If postural collapse is deemed an essential term please provide a clear definition.

I suggest correction for the following: P5 (bottom) I do not understand what is meant by: “Before starting active self-correction, the patient stays active, to recover postural collapse.” Clarify if the patient is to be in their natural posture or if they are to apply some self-correction. If yes specify what they are asked to do as corrections.

P4 (top instructions). A discussion or a rationale section nearby should be added to justify why you propose the instructions (caudal first, sagittal first) in the first 3 bullets. Are these evidence based?

28-34 Ok

P6 In the first bullet under basic exercise. Specify if the translation is to the convex/concave side?

P7 In the 2nd bullet under Advanced exercise: Specify the sagittal plane correction requested of the patient.

P7. In the overview of the protocol. Discuss how long is devoted to the evaluation, the teaching and the counselling during the 1.5 hr session. Here or in a separate section, please describe who is involved in delivering the SEAS therapy and their qualification process.

P7 Consider adding a paragraph or a few sentence to explain the topics covered in counselling and how it is done.

P7 In the program overview, specify the overall duration of SEAS therapy delivery and follow-up. What criteria are used to discontinue therapy and discharge patients? (could fit where requested earlier. )

P8 (top) I am not sure the “stress” created by the exercise is the right term. Consider using the challenge level or the difficulty level instead.

P8 Bullet 1; under exercise type (typology) can you specify a list of the types of exercise in the SEAS approach (e.g. dynamic motion of more or less range, balance exercise of more or less difficulty, loading/strengthening exercise….)

Throughout the paper the term stimulate is used in two different context. To avoid
confusion: 1) as stimuli to elicit a reflex response (use stimuli or triggering a reflex). 2) to provide a training challenge/ stimulus (use to train or to challenge).

ok

P9. Unders scoliosismanager: I do not recommend emphasizing "Complex". I recommend using the term Therapist instead of operator to clarify the target audience. I recommend to only focus on the software exercises meant for scoliosis in this paper. The term discriminant is confusing.

P13. For fig 2, 4, 6, 8, Please clarify that the pictures are not after self-correction they are during self-correction. (you could consider introducing pictures of patients before the program compared to the after the program.). Maybe also clarify that Fig 5 and 7 (any others as well) reflect the natural posture of the patients without doing the exercise or the self-correction.

P16 Some terms are unusual.

Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)

A short discussion section could be prepared to discuss the key similarity and differences between SEAS and the other scoliosis-specific approaches. The discussion could highlight the level of evidence available to support the various guiding principles supporting how the approach is implemented and highlight a research agenda for the topics for which more evidence is needed (eg. The idea presented above).

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

'I declare that I have no competing interests'