Author's response to reviews

**Title:** Effect of low-level laser therapy (904 nm) and static stretching in patients with knee osteoarthritis: a protocol of randomised controlled trial.

**Authors:**

Sarah RF Meneses (sarah.meneses@usp.br)
David J Hunter (david.hunter@sydney.edu.au)
Eunice Y Docko (eunicedocko@gmail.com)
Amelia P Marques (pasqual@usp.br)

**Version:** 2  
**Date:** 1 March 2015

**Author's response to reviews:** see over
Author's response to reviews

Title: Effect of low-level laser therapy (904 nm) and static stretching in patients with knee osteoarthritis: a protocol of randomised controlled trial.

Authors:

Sarah R F Meneses (sarah.meneses@usp.br)

David J Hunter (david.hunter@sydney.edu.au)

Eunice Y Docko (eunicedocko@gmail.com)

Amelia P Marques (pasqual@usp.br)

Version: 2 Date: 01 March 2015

Author's response to reviews: see over

Dear Editor,

We thank you and the reviewers for the insightful review of our manuscript. Below we attach a list of our corrections and detailed responses to the reviewers’ comments as well as edits made to the manuscript with line numbers from the tracked changes version of the paper. Enclosed please find the revision of our manuscript both with marked changes and then appropriately formatted with the changes removed.

We hope that the revised manuscript has met the reviewers’ suggestions and is now acceptable for publication.

Kind Regards,

The authors
Reviewer's report

**Title:** Effect of low-level laser therapy (904 nm) and static stretching in patients with knee osteoarthritis: a protocol of randomised controlled trial.

**Version:** 1  **Date:** 15 November 2014  
**Reviewer:** Ru-Lan Hsieh

**Reviewer's report:**

Major Compulsory Revisions

This study aimed to investigate (1) the effect of static stretching and low-level laser therapy, in combination or as monotherapy, in the management of pain in patients with knee OA; and (2) evaluate the influence of each intervention of quality of life, function, mobility, knee flexion range of motion, and hamstring strength. I have some comments as listed below:

1. They aimed to investigate effects of stretch exercise, laser, and both effects simultaneously. However, they classified the groups into 5 groups with different duration: laser therapy (8 weeks), exercise (8 weeks), both therapy (3 weeks of active laser therapy followed by 8 weeks of exercise), both therapy (3 weeks of placebo laser therapy followed by 8 weeks of exercise), and control group (8 weeks). If they aimed to investigate the effect of exercise and laser therapy, then the duration of both treatments should be equal. The followed up time was different, either at 8 weeks after treatment or after 11 weeks after treatment. The time effect would severely bias the study results. In addition, the design of group classification should be 6 groups with same duration as: exercise alone, active laser, placebo laser, exercise with active laser, exercise with placebo exercise, and placebo groups.

*Duration of treatment:* As the reviewer notes, all monotherapy groups had durations of 8 weeks, as this duration is usually used in knee osteoarthritis clinical trials as an effective period of treatment. Additionally, this study includes two supplementary groups with a preparatory period of 3 weeks of laser active/placebo before the standard 8 weeks of exercise treatment. The World Association of Laser Therapy suggests a 2 to 3-week duration for laser therapy. A potential group involving simultaneous laser/placebo and stretching exercises, within a single 8-week period, was not considered as the number of treatments per week and the time spent would not be feasible with clinical practice. If the chosen preparation period is found to improve the standard 8-week period of exercise then further studies could determine the optimal combination of treatment durations.

*Number of groups:* As the reviewer suggests we also would have preferred to have a sixth group. The ethical committee didn’t approve a group with placebo laser alone. This is recognised as a study limitation. We included the sentence: “It is important to note that the ethics committee did not approve the inclusion of a group with placebo laser as monotherapy, resulting in a study limitation”.

---

2 [http://waltza.co.za/documentation-links/recommendations/dosage-recommendations/](http://waltza.co.za/documentation-links/recommendations/dosage-recommendations/)
2. In the exercise group, they aimed to investigate the effect of stretch exercise. However, all patients in exercise groups underwent 10 min of strengthening exercise by either bike or treadmill. Therefore, the improvement noted in exercise groups would be the effects of both stretch exercise and strengthening exercise rather than the real stretch exercise effect.

*Strengthening exercise: The period of 10 minutes spent on the treadmill or bike is not considered a strengthening exercise, but rather a warm-up period due the light intensity and is consistently used as such in most exercise studies.*

This phase had the aim to prepare the muscles and joints for the following stretching exercise.

3. Thermotherapy has effect on pain relief. The present study allowed patients to take analgesics and thermotherapy for pain control during the intervention period. How to eliminate the confounding effect by these variables, especially the thermotherapy effect?

*Confounding effect: The participants were instructed to not take any analgesics and not make use of thermotherapy 24 hours prior the re-assessment. The pain relief effect of these interventions has short period of action and we believe that the follow-up assessment was not impaired by the use of pain relieving agents during the intervention period.*

4. This study was conducted since May 2012, and will be completed in the end of this year. It means the study will be completed in recently. I suggest the authors to publish the research paper after completion of data analysis.

*The study was completed in the end of 2014. The data analysis is already being executed as well the main results paper. At this point these are not submitted. We expect to submit the main results paper after the study protocol approval since we want to reference the protocol paper with its detailed methodology. We updated the timeline in the manuscript.*

5. Only SD of VAS was mentioned in the sample size calculation. How could they get the sample size?

*The description of sample size calculation is now better detailed in the text. The updated version is: “The primary outcome measure VAS (range: 0-10 cm) was used to estimate the sample size. Using a minimal clinically important change of two-point difference between the treatment groups and control group, with a significance level of 0.05 (2-tailed) and a power of 80%, we estimated that 25 participants were needed in each group. To allow for a 15% drop-out rate, we aimed to include 29 participants in each group.”*

6. In the discussion section, the authors mentioned that “if adding of low-level laser therapy to guideline-endorsed conventional physiotherapy provides greater pain relief and functionally improvement than conventional physiotherapy alone, this method could be confirmed as an effective treatment for these patients”. However, as we known, the effect of stretch exercise on patients with knee OA is still lacking and the present study did not perform the conventional physiotherapy additionally. How could they get this comment?

---

Discussion: The excerpt was corrected in order to be more consistent with the findings of our study. The corrected version is: “For example, if adding LLLT to muscle stretching program provides greater pain relief and functional improvement than stretching exercises alone, this method could be advised as an effective treatment option for these patients.”

7. The present study included patients with Kellgren and Laurence classification between 2-4. However, patients with K-L classification 4, there were marked joint space narrowing and definite deformity. In general, grade 4 patients are not suggested to receive conservative treatment such as physiotherapy. Why the authors did include these patients in the present study?

Kellgren-Lawrence grade: There is strong evidence in literature showing that the radiographic severity is not strongly correlated to symptoms in persons with osteoarthritis\(^4\). As result, the recent guidelines advice the choosing a treatment based on symptomatology\(^5,6,7,8,9\).

This is why people with grade 4 were not excluded from the study. Furthermore there are no clear internationally accepted criteria that suggest that persons with severe radiographic disease will not benefit from conservative treatment.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.

---


Reviewer's report

Title: Effect of low-level laser therapy (904 nm) and static stretching in patients with knee osteoarthritis: a protocol of randomised controlled trial.

Version: 1 Date: 22 December 2014

Reviewer: Ernesto Cesar Leal-Junior

Reviewer's report:

Major Compulsory Revisions

A detailed report of laser therapy parameters is needed. I strongly recommend authors to follow the reference below to report parameters:


The report of laser parameter was remade following the reviewer advice and the information is detailed in table 1.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>IBRAMED</td>
</tr>
<tr>
<td>Model Identifier</td>
<td>LaserPulse</td>
</tr>
<tr>
<td>Number of Emitters</td>
<td>1</td>
</tr>
<tr>
<td>Emitter Type</td>
<td>GaAS</td>
</tr>
<tr>
<td>Beam Delivery System</td>
<td>Hand-held probe</td>
</tr>
</tbody>
</table>

### Irradiation Parameters

<table>
<thead>
<tr>
<th>Parameter [unit]</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center wavelength [nm]</td>
<td>904</td>
</tr>
<tr>
<td>Spectral bandwidth [nm]</td>
<td>724 - 1009</td>
</tr>
<tr>
<td>Operating mode</td>
<td>pulsed</td>
</tr>
<tr>
<td>Frequency [Hz]</td>
<td>9,500</td>
</tr>
<tr>
<td>Pulse duration [ns]</td>
<td>60 ns ± 20%</td>
</tr>
<tr>
<td>Peak radiant power [W]</td>
<td>70</td>
</tr>
<tr>
<td>Average radiant power [mW]</td>
<td>40</td>
</tr>
<tr>
<td>Beam profile</td>
<td>Circular</td>
</tr>
</tbody>
</table>

### Treatment Parameters

<table>
<thead>
<tr>
<th>Parameter [unit]</th>
<th>Value</th>
<th>Additional notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam spot size at target [cm²]</td>
<td>0.13090</td>
<td></td>
</tr>
<tr>
<td>Irradiance at target [mW/cm²]</td>
<td>305.6</td>
<td></td>
</tr>
<tr>
<td>Exposure duration [sec]</td>
<td>11 minutes and 25 seconds</td>
<td>Per knee</td>
</tr>
<tr>
<td>Radiant exposure [J/cm²]</td>
<td>22.9</td>
<td></td>
</tr>
<tr>
<td>Radiant energy [J]</td>
<td>3</td>
<td>Per knee</td>
</tr>
<tr>
<td>Number of points irradiated</td>
<td>9 points per knee</td>
<td></td>
</tr>
<tr>
<td>Area irradiated [cm²]</td>
<td>0.13090</td>
<td>Per point</td>
</tr>
<tr>
<td>Application technique</td>
<td>Contact with pressure</td>
<td></td>
</tr>
<tr>
<td>Number and frequency of treatment sessions</td>
<td>9 treatments total - 3x/week</td>
<td></td>
</tr>
<tr>
<td>Total radiant energy [J]</td>
<td>27</td>
<td>Per knee</td>
</tr>
</tbody>
</table>

Table 1. Device information, irradiation and treatment parameters

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

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

**Declaration of competing interests:**

I currently receive research support from Multi Radiance Medical, a laser device manufacturer.