Law D, McDonough S, Bleakley C, and et al. Laser Acupuncture for Treating Musculoskeletal Pain: A Systematic Review with Meta-analysis. J Acupunct Meridian Stud 2015; 8(1):2e16.

Reviewer: Linda Metzger 7-15-15

Design: A Systematic Review with Meta-analysis

Objective: To evaluate the effects of laser acupuncture on pain and functional outcomes when it is used to treat musculoskeletal disorders and to update existing evidence with data from recent randomized controlled trials (RCTs).

Summary of Results:

- Forty nine RCTs met the inclusion criteria and were included in the systematic review. Two-thirds (31/49) of these studies reported positive effects, were of high methodological quality, and reported the dosage adequately. Negative or inconclusive studies commonly failed to demonstrate these features.
- For all diagnostic subgroups, positive effects for both pain and functional outcomes were more consistently seen at long-term follow-up rather than immediately after treatment.
- Moderate-quality evidence supports the effectiveness of laser acupuncture in managing musculoskeletal pain when applied in an appropriate treatment dosage, but the positive effects are seen only at long-term follow-up and not immediately after the cessation of treatment.
- Main outcomes were pain and function evaluated immediately after the intervention and long-term (6 weeks to 6 months).

Reasons not to Cite as Evidence:

- All of the meta-analyses conducted resulted in high heterogeneity with all I^2 values greater than 50% and most greater than 70%. Highly significant statistical heterogeneity was present in the pooled analyses. The trials were very different from each other. This variation may be due to differences in characteristics of the intervention, differences in patient characteristics, or bias. The trials should probably not have been pooled, since pooled data with high heterogeneity may not have a clinically useful interpretation and must be interpreted with caution.
- The pooled results of the meta-analyses are further flawed in that they comprised a substantial number of low-quality trials with methodological limitations. The risk of bias in the included studies was assessed according to the PEDRO scale. In the meta-analysis for pain measured at the end of the intervention, 6 of 17 studies had PEDro scores of less than 6, the moderate cut-off score.
- It is unclear why several studies with a lower risk of bias (PEDro >6) were excluded from the meta-analyses.
- The authors claim that evidence supports the effectiveness of laser acupuncture in managing musculoskeletal pain only at long-term follow-up and not immediately after the cessation of treatment, but they offer no explanation or mechanism of action to explain this result. The biological plausibility of this result is difficult to understand.

- The criteria used to select studies for inclusion or exclusion in the meta-analyses is unclear appears to be indiscriminate.
- While a potential benefit of low level laser for the treatment of musculoskeletal pain in adults cannot be ruled out, the currently available evidence from clinically heterogeneous trials is insufficient to support the routine use of this intervention in clinical practice.

Assessment: Inadequate for evidence of the effect of laser acupuncture as part of the treatment to improve function or reduce pain for musculoskeletal disorders in adults.