# Effectiveness of rehabilitation for patients with Subacromial impingement syndrome: a systematic review

Lori A Michener, PhD, PT, ATC, SCS, Matthew K Walsworth, PT, ECS, OCS, Evie N Burnet, PT
Journal of Hand Therapy, Volume 17, Issue 2, April–June 2004, Pages 152–164
http://dx.doi.org/10.1197/j.jht.2004.02.004

The limited evidence currently available suggests that exercise and joint mobilizations are efficacious for patients with SAIS. Laser therapy appears to be of benefit only when used in isolation, not in combination with therapeutic exercise. Ultrasound is of no benefit, and acupuncture trials present equivocal evidence.

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# Red (660 nm) and infrared (830 nm) low-level laser therapy in skeletal muscle fatigue in humans: what is better?

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Lasers in Medical Science 2012 March 2012, Volume 27, Issue 2, pp 453-458,

In animal and clinical trials low-level laser therapy (LLLT) using red, infrared and mixed wavelengths has been shown to delay the development of skeletal muscle fatigue. However, the parameters employed in these studies do not allow conclusions to be made regarding the best wavelength for delaying the development of skeletal muscle fatigue. With this perspective in mind, we compared the effects of red and infrared LLLT on skeletal muscle fatigue and performance in humans. Seventeen healthy male volunteers. They were treated with active red LLLT, active infrared LLLT (660 or 830 nm, 50 mW, 17.85 W/cm2, 1008 J/cm2 per point, 7 J, 35 s) and placebo LLLT (0 mW, 0 W/cm2, 0 J/cm2, 0 s) in a randomized, double-blind, crossover design. Each subject received an identical placebo LLLT at four points of the biceps brachii muscle for 3 min before exercise (voluntary isometric elbow flexion at 60° of shoulder flexion). The mean peak force was significantly greater ($p < 0.05$) following red (12.14%) and infrared LLLT (14.49%) than following placebo LLLT, and the mean average force was also significantly greater ($p < 0.05$) following red (13.09%) and infrared LLLT (13.24%) than following placebo LLLT. There were no significant differences in mean average force or mean peak force between red and infrared LLLT. We conclude that both red than infrared LLLT are effective in delaying the development skeletal muscle fatigue and in enhancement of skeletal muscle performance. Further studies are needed to identify the specific mechanisms through which each wavelength acts.

We conclude that both red than infrared LLLT are effective in delaying the development skeletal muscle fatigue and in enhancement of skeletal muscle performance.

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# Additive effects of low-level laser therapy with exercise on subacromial syndrome: a randomised, double-blind, controlled trial

Seyyed Mohammad Jalil Abrisham, Mohammad Kermani-Alghoraishi, Rahil Ghahramani, Latife Jabbari, Hossein Jomeh, Maryam Zare

Clinical Rheumatology 2011 Clinical Rheumatology October 2011, Volume 30, Issue 10, pp 1341-1346

The subacromial syndrome is the most common source of shoulder pain. The mainstays of conservative treatment are [illegible] exercise therapy. Low-level laser therapy (LLLT) has been popularized in the treatment of various musculoskeletal disorders. The aim of this study is to evaluate the [illegible] subacromial syndrome. We conducted a randomised clinical study of 80 patients who presented to clinic with subacromial syndrome [illegible] group I (n = 40), patients were given laser treatment (pulsed infrared laser) and exercise therapy for ten sessions during [illegible] therapy were given for the same period. Patients were evaluated for the pain with visual analogue scale (VAS) and shoulder range of motion (ROM) in an active and passive movement of flexion, abduction and external rotation before and after treatment. In both groups, significant post-treatment improvements were achieved in all parameters (P = 0.00). In comparison between the two groups, a significant improvement was noted in all movements in group I (P = 0.00). Also, there was a substantial difference between the groups in VAS scores (P = 0.00) which showed significant pain reduction in group I. This study indicates that LLLT combined exercise is more effective than exercise therapy alone in relieving pain and in improving the shoulder ROM in patients with subacromial syndrome.

This study indicates that LLLT combined exercise is more effective than exercise therapy alone in relieving pain and in improving the shoulder ROM in patients with subacromial syndrome.

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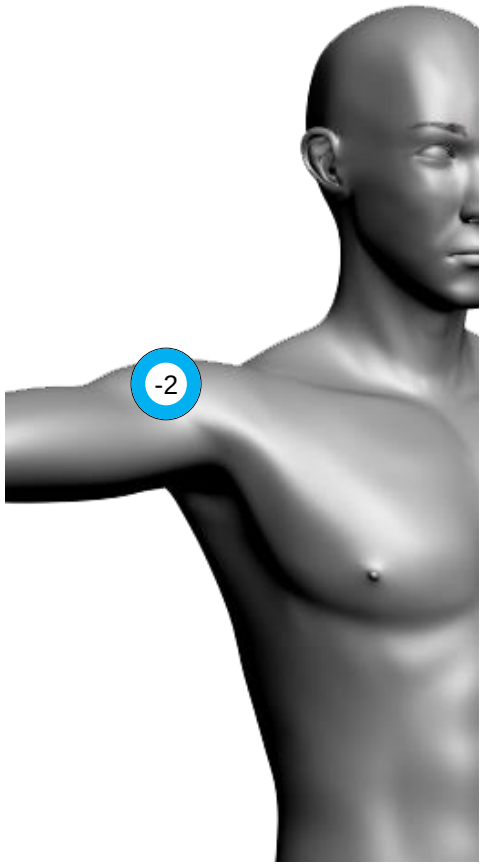
# Priority Principle™: Shoulder Subacromial Impingement




| Priority | Principle | Frequency | Time |
|---|---|---|---|
| -2 | <48 Hours (Acute Injury) | 5-1000 Hz | 3 Minutes |

| # of treatments | | | | | |
|---|---|---|---|---|---|
| | | | | | |

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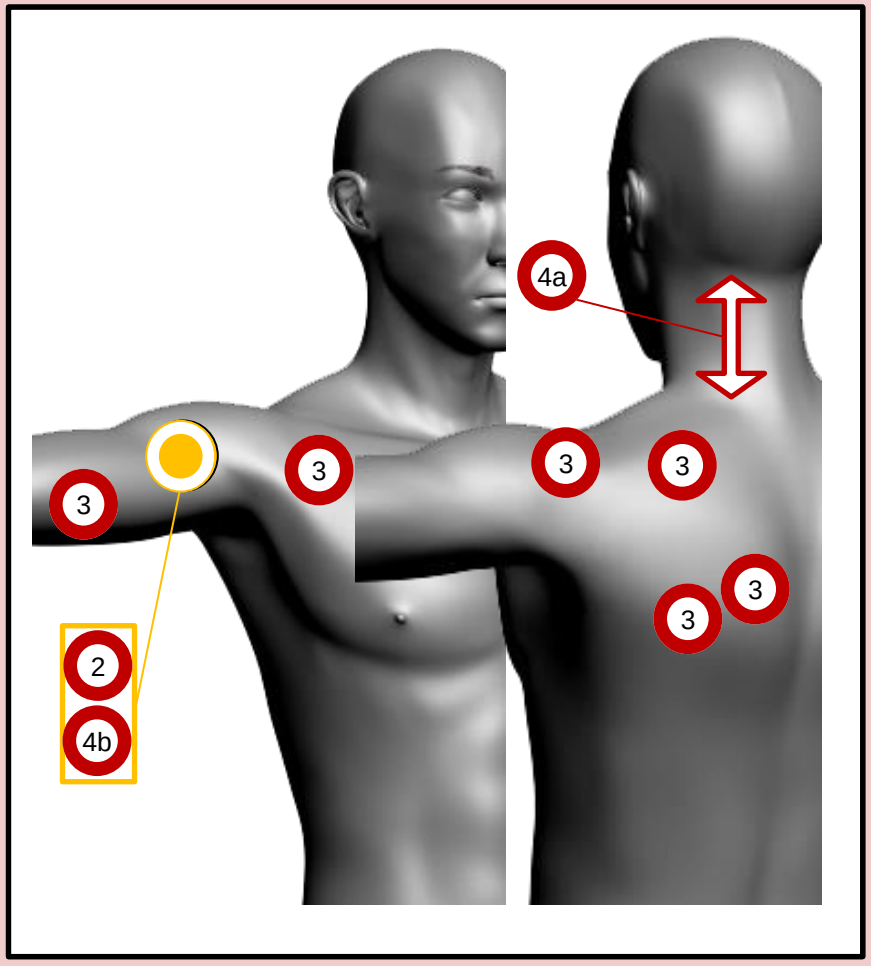


| Priority | Principle | Frequency | Time |
|---|---|---|---|
| 0 | Pain (PRN) | (PRN) | |
| 2nd | Inflammation | 50 Hz | DOSE |
| 3rd | Spasms | 1000 Hz PRN | Pontinen's Principle |
| 4th (a) | Pain (Systemic) | 1000 Hz NRT | See Method |
| | OR | | |
| (b) | Pain (Local) | 1000, 3000 or 5000 Hz | 3-5 minutes |

| # of treatments | | | | | |
|---|---|---|---|---|---|
| | | | | | |

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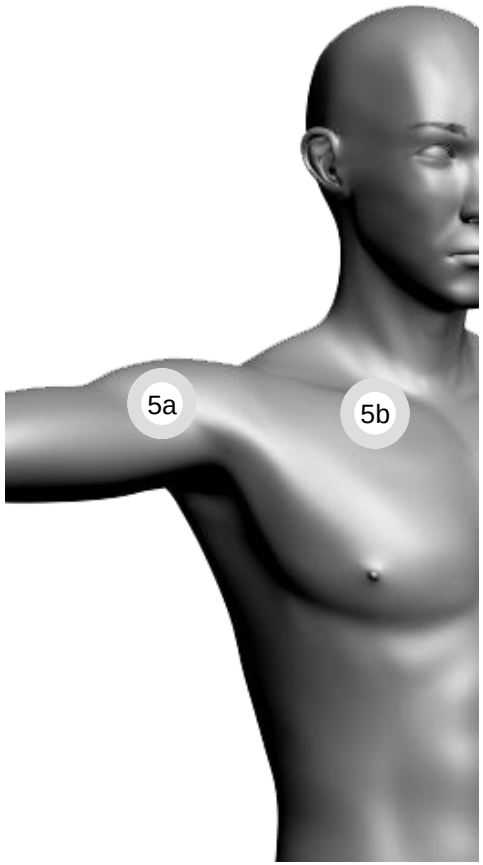


| Priority | Principle | Frequency | Time |
|---|---|---|---|
| 5th (a) | Tissue Repair (Primary) | 5-250 Hz | DOSE |
| | and | | |
| (b) | Tissue Repair (Secondary) | 50 Hz PHT @ subclavian artery | 5 minutes |

| # of treatments | | | | | |
|---|---|---|---|---|---|
| | | | | | |

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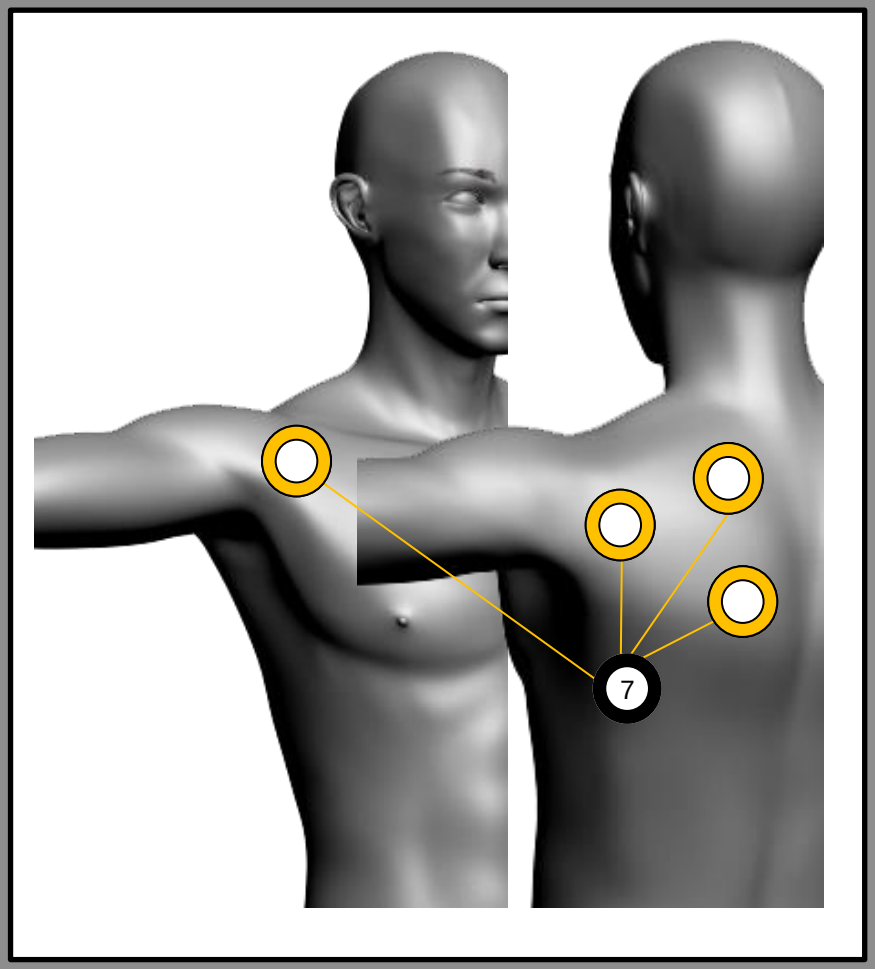
# Priority Principle™: Shoulder Subacromial Impingement




| Priority | Principle | Frequency | Time |
|---|---|---|---|
| 7th | Functional Strength: of affected muscle(s) during training/activity period | 5-250 Hz pre activity or 1000 Hz immediately before | 2-3 min scanning with LaserShower* |

| # of treatments | | | | | |
|---|---|---|---|---|---|
| | | | | | |

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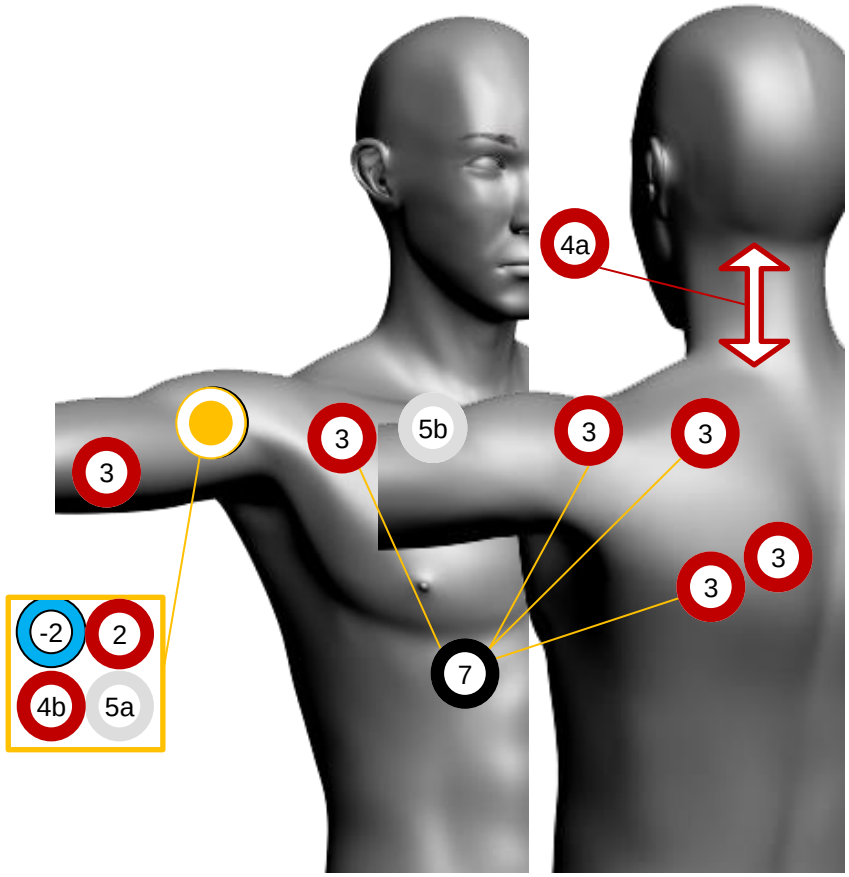
# Priority Principle™: Shoulder Subacromial Impingement




| Priority | Principle | Frequency | Time |
|---|---|---|---|
| -2 | <48 Hours (Acute Injury) | 5-1000 Hz | 3 Minutes |
| 0 | Pain (PRN) | (PRN) | |
| 2nd *** | Inflammation | 50 Hz | DOSE |
| 3rd | Spasms | 1000 Hz | Pontinen's Principle |
| 4th (a) | Pain (Systemic) | 1000 Hz NRT | See Method |
| | OR | | |
| (b) | Pain (Local) | 1000, 3000 or 5000 Hz | 3-5 minutes |
| 5th (a) | Tissue Repair (Primary) | 5-250 Hz | DOSE |
| | and | | |
| (b) | Tissue Repair (Secondary) | 50 Hz PHT (subclavian) | 5 minutes |
| 7th *** | Functional Strength: of affected muscle(s) during training/activity period | 5-250 Hz pre activity or 1000 Hz immediately before | 2-3 min scanning with LaserShower* |

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