

## Key Points

1. Chronic neck pain is a serious problem for Chiari and syringomyelia patients, even after surgery
2. Outside the US, low level laser therapy (LLLT) has been used for years to treat pain; also gaining popularity among professional athletes
3. In US, FDA recently approved an LLLT product for a wide range of pain treatments
4. To date, research on effectiveness of LLLT is limited
5. Study extensively reviewed literature to identify well designed LLLT trials for neck pain
6. Identified 5 randomized, controlled trials which fit criteria
7. 4 trials showed a positive effect for LLLT on chronic neck pain
8. More research, with larger studies, are required to establish the specifics of LLLT for neck pain

## Definitions

**acute** - short lasting

**chronic** - lasting for an extended period of time; in reference to pain, usually 3 months or more

**controlled** - type of study which uses a control group

**control group** - in an experiment, a group of subjects which is used as a basis for comparison

**infrared** - type of light which can not be seen by the human eye

**laser** - Light Amplification by Stimulated Emission of Radiation, a device that produces a focused beam of light at a specific wavelength

**low level laser therapy** - type of treatment, currently used for musculo-skeletal pain, which uses low intensity lasers

## Laser Therapy Effective For Chronic Neck Pain

Chronic neck pain is a significant problem for the Chiari and syringomyelia community. Research has shown that neck pain can lead to a decrease in overall health and chronic pain in general is linked to a host of ills, including high blood pressure and the early aging of the brain.

While up to 25% of the general population may experience neck pain at some point, most primary care physicians use over the counter medicines, like Tylenol or NSAIDs, sometimes in combination with physical therapy, to treat it. Unfortunately for Chiari patients, these treatments are often inadequate and provide short-term relief at best.

Previously, this publication has reported on a number of alternative therapies for neck pain, including acupuncture and botox. In the last few years, another type of therapy has begun to be used outside the US and is gaining popularity with professional athletes (both in the US and worldwide). Low level laser therapy (LLLT) uses a small power laser to direct infrared light on painful spots.

Unlike lasers used in surgery, which are powerful enough to burn tissue, the low level lasers do not use heat. In fact, this type of therapy will change the temperature of the skin by less than 1/2 of a degree. The lasers use infrared light, which can not be seen by the human eye, but which will penetrate a small distance into the body.

While it is not clear exactly how low level lasers are supposed to reduce pain, it is believed that - like acupuncture - the light stimulates the bodies natural healing abilities, for example by increasing blood circulation to the effected area.

Like so many new, or alternative, therapies, the research on LLLT is sketchy and difficult to draw conclusions from. Some reviews on LLLT therapy have found that it has no consistent positive effect, while others have found that it is effective for certain types of pain, such as myofascial pain associated with trigger points. Because of the early state of the research, while LLLT has some strong proponents, other medical professionals remain skeptical and are waiting for further data.

Weighing in on the issue, Roberta Chow and Dr. Les Barnsley, from Australia, recently published a review of LLLT trials used to treat neck pain. Published in the July, 2005 issue of the journal *Lasers in Surgery and Medicine*, the researchers found evidence - though limited - that LLLT can be effective in treating non-specific neck pain.

In looking at the existing reviews, Chow and Barnsley came to believe that one reason the research picture on LLLT was muddled is that researchers tended to lump together too many disparate things, such as laser acupuncture and different types of pain, so that positive effects of LLLT might have been getting lost in the noise. They decided to do an extensive literature review for research trials which fit strict criteria (which they developed prior to doing the search). They looked for trials with adults suffering from chronic, non-specific neck pain, which were designed as random, controlled trials, and which used neck pain as an outcome measure. Studies which were not in English, which involved laser acupuncture, and which were not random, controlled trials were excluded. In addition, the authors developed criteria to rate the trials on methodological and technical quality. A study which scored high in these areas should be able to be repeated by other researchers.

Next, the team developed a comprehensive list of search terms and scoured a dozen databases for LLLT research. They initially identified 20 possible research studies, out of which 5 met the strict criteria they had established (see Figure 1). Four out of these five studies were scored high on their methodology, while one was weak.

Although all the identified studies used LLLT for neck pain, the specifics of the treatments, and the ways in which neck pain were measured, varied quite a bit. The exact wavelength of the light used was different in different studies, as were the power of the lasers, how many treatments were received, and where the light was applied. Because of this, the team was not able to statistically combine the results of the different studies in a formal meta-analysis.

They did find, however, that four out of the five studies showed that LLLT, despite the variations in implementation, had a positive effect on neck pain. One study even demonstrated that the improvement lasted for at least six months. The results of the remaining study were inconclusive because of the way it was designed. In addition, Chow and Barnsley were able to show that in two of the studies, the level of pain improvement was large.

Only three of the studies mentioned side effects, with two of the three reporting no side effects to the treatment

**meta-analysis** - type of study which examines the results of several previous studies and tries to combine the results

**myofascial** - pain related to sensitive trigger points in the muscle and surrounding tissue

**NSAID's** - non steroidal anti-inflammatory, class of drugs used to reduce pain and swelling; ibuprofen and naproxen are common NSAID's

**randomized** - type of trial in which participants are randomly assigned to be in either a treatment group or a control group

**wavelength** - the distance between a point on a wave and the same point on the next wave; in visible light, wavelength defines what color the light is

## Source

Chow RT, Barnsley L. Systematic review of the literature of low-level laser therapy (LLLT) in the management of neck pain. Lasers Surg Med. 2005 Jul;37(1):46-52.

were encountered. One study noted some people experienced nausea, weakness, and other minor issues for a short period of time, but the side effects were not considered serious. Overall the team characterized the findings of their review as demonstrating that there is evidence, although limited, that LLLT can be effective for certain types of neck pain, and they stress the need for continued research, especially to develop the specifics of treatment.

It should be noted that the Food & Drug Administration recently approved an LLLT product, sold by Erchonia, to treat a wide variety of acute and chronic pains in the US (see [Low Level Laser Receives FDA Approval For Pain Relief](#)). On their website ([www.erchonia.com](http://www.erchonia.com)), Erchonia provides more information about their LLLT products, who is using them, and the research that supports their claims.

**Figure 1**  
**Selected Parameters of Studies Which Met Criteria**

Study	# Subjects	# Treatments	Significant Effect?
1	39	1	Yes
2	71	1/day for 2 weeks	Yes
3	41	5 over 2 weeks	Inconclusive
4	60	1/day for 10 days	Yes
5	62	1/day for 10 days	Yes

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