

Ultrasound parameters and treatment goals will vary depending on the condition and the doctor's orders. There are several treatment techniques that all ultrasound treatments will have in common.

1. A coupling agent such as water or water-soluble gel must be used.
2. Ultrasound head should be in constant motion and cover an area two to three times larger than the sound head diameter.
3. The sound head should remain in contact with the skin at all times.  
During underwater ultrasound, there should be a small gap between the sound head and the skin.

There are many uses of ultrasound to treat a variety of conditions. It is used for both thermal and non-thermal benefits. Some of its benefits include:

1. Soft tissue healing occurs with both continuous and pulsed ultrasound. Ultrasound promotes the healing process by accelerating the inflammatory response phase.
2. Ultrasound can increase the mobility of scar tissue. The thermal effects of continuous ultrasound increase the flexibility of the collagen fibers in scar tissue.
3. Tendonitis, bursitis, and other chronic inflammation conditions can benefit from ultrasound because it promotes healing and the reduction of pain.
4. Ultrasound can help to assess the presence of a stress fracture. When fractures are present, the periosteum may be sensitive to the stimulation created by ultrasound. If a patient gets the feeling of pressure, bruising, or aching, it could mean the presence of a stress fracture. (This is controversial as a benefit, but is included for historical significance.)
5. Some unproven clinical applications include absorption of calcium deposits, treatment of plantar warts, and bone healing.

Review the indications and contraindications for ultrasound therapy in Figure 7.S on page 205. As with all modalities be sure and pay attention to these indications and contraindications and follow the protocols set in your clinic.

### Light Therapy (Lasers)

The acronym **L.A.S.E.R.** laser stands for **L**ight **A**mplification of **S**timulated **E**missions of **R**adiation. Lasers focus the light into a very precise and uniform beam. Light energy is made up of photons and lasers that use the actions of these photons to create its physiological benefits. The laser is able to create such a specific beam of photon energy due to three properties.

1. **Monochromaticity**- all photons have a uniform wavelength and color.
2. **Coherence**- all photons have the same wavelength and all light waves are in phase with each other.
3. **Collimation**- photons have little divergence as they travel, the rays of the beam stay close together.

There are many different types of lasers and uses commonly found in many varying industries. In chiropractic, the most common lasers are low-level or cold lasers, which do not produce heat; instead, the lasers produce a photochemical effect in the body that stimulate the targeted cells. The depth of penetration varies depending on the properties of the laser being used.

Low-level lasers are often used for pain reduction, wound healing, edema reduction, and the reduction of scar tissue. These physiological effects occur mainly at the cellular level. Lasers can shorten healing time and reduce infection by destroying bacteria and reducing inflammation.

## Cervical and Lumbar Traction

Traction occurs when a strong enough pulling force is applied to the spine causing separation of the vertebrae from one another. Traction can be attained through a mechanical, manual, or gravitational force. The separation of spinal segments can increase spinal movement, decrease pressure on discs, increase fluid movement in joint spaces, lengthen the spinal ligaments, reduce nerve pressure and irritation, and decrease pressure on facet joints. Traction can be performed on the cervical and lumbar vertebrae. There are various forms of traction that can be used to obtain the benefits created by a decompressed spine. They include:

1. **Manual traction** occurs when the practitioner applies a force and passively distracts the spine. No equipment is required to perform manual traction.
2. **Continuous traction** uses a device to create a sustained pull to distract the vertebral segments. The pull remains constant through the length of the treatment. The device used is some form of a pneumatic unit such as a weight-and-pulley system or an over-the-door traction unit.
3. **Intermittent traction** can be applied manually or by a device but involves cycles of distraction and relaxation.
4. **Spinal decompression** is a variation of traditional traction that uses a computer to create controlled intervals of pulling and relaxation. This allows the muscles to remain relaxed as the pull increases to help prevent the muscles from tightening and guarding against the pull of the machine.
5. **Intersegmental traction** uses a system of rollers that move up and down the spine and create movement of the spinal segments. It helps improve the movement of fluid in the discs that contain nutrients to help keep the discs healthy.

With all of the various forms of traction make sure you follow the protocols established by your clinic to ensure safe and effective application of the treatment. Review the application sections regarding traction on pages 212-214 for standard protocols and tips for many treatments.