

# Joint Therapy Modality Comparison

## **SONOTRON THERAPY**

The Sonotron is a non-invasive device producing a corona discharge beam for the treatment of painful joint conditions. It employs radio frequency energy of 430 kilohertz (430,000 cycles per second, long wave) combined with a sound wave at 1 kilohertz (1,000 cycles per second, audible). The resulting energy of this combined wave is emitted through a hand-held applicator in the form of a corona discharge. The output power of the Sonotron is 8 watts and the patient is exposed to the corona output for short periods of 45 seconds to 3 minutes depending on the size and density of the joint. After a series of 3 to 5 treatments, patients have reported pain relief which has lasted for comparatively long periods, typically averaging 4 to 6 months. There have been no reported side effects or hazards.

## **RF DIATHERMY**

Radio Frequency or RF Diathermy has been used for decades for treating painful joint conditions by developing deep heat within tissue. As its name implies, RF Diathermy creates deep heat in the body by use of radio frequency energy which is passed from a transmitter electrode to a receiving electrode with the painful body part carefully positioned between these electrodes. RF Diathermy uses radio waves at 27.12 megahertz (27,120,000 cycles per second) - a microwave frequency. In order to achieve therapeutic heat levels it requires 300 to 600 watts of power with the patient exposed for 15 to 45 minutes. The patient does feel pain relief due to the therapeutic effects of heat which is generated in the joint. Typically the pain relief lasts for several hours and diminishes quickly as the joint is used and the heat dissipates. There is an electrical burn hazard associated with RF Diathermy which can be caused by improper positioning of the patient or movement while treating.

## **ULTRASOUND DIATHERMY**

Ultrasound Diathermy ("UD") is also a deep heat modality. Through vibrations developed by sound waves emitted by the UD device, heat is developed by the frictional vibration effect of cellular tissue movement. The UD device is administered to the patient by first applying gel to the area to be treated and then pressing a sound transducer to the area. The sound waves are passed into the body to cause vibration of the tissues to create heat. In order to be effective, the patient must be exposed to the sound waves for 15 to 60 minutes and the application must be performed by a trained technician to insure that proper contact is achieved. Although UD does create deep heat it is not as efficient in the depth to which the heat can penetrate due to the resistive and dissipative effect of the volume and density of

tissue. The patient does feel pain relief due to the therapeutic effect of heat which is developed in the joint. Typically the relief lasts for several hours and diminishes quickly as the joint is used and the heat is dissipated.

## COLD LASER THERAPY

Cold Laser Therapy ("CLT") is actually a misnomer due to the fact that the output of these devices is not actually cold but is at a much reduced level than those lasers used for cutting or burning. CLT is used for treating joint pain by exposing the area to be treated with high intensity laser light which penetrates deeply within tissue to achieve therapeutic heat. There has also been research and theories developed regarding the hypothesis that CLT does not rely solely on the heat generated by the laser but also has a cellular effect. However, no definitive results have been achieved to substantiate this theory. Patients that respond to CLT experience pain relief for short periods. Certain patients have experienced negative effects such as burns to certain laser frequencies.

### Modality Comparison Chart

Modality	Power	Time Applied	Duration of Relief	Hazards
sonotron	8 watts	.75 to 3 minutes	months	none
RF Diathermy	300 to 600 watts	15 to 45 minutes	hours	electrical burns
Ultrasound Diath.	100 to 500 watts	15 to 60 minutes	hours	none
Cold Laser	NA	1 to 5 minutes	days	tissue burns