

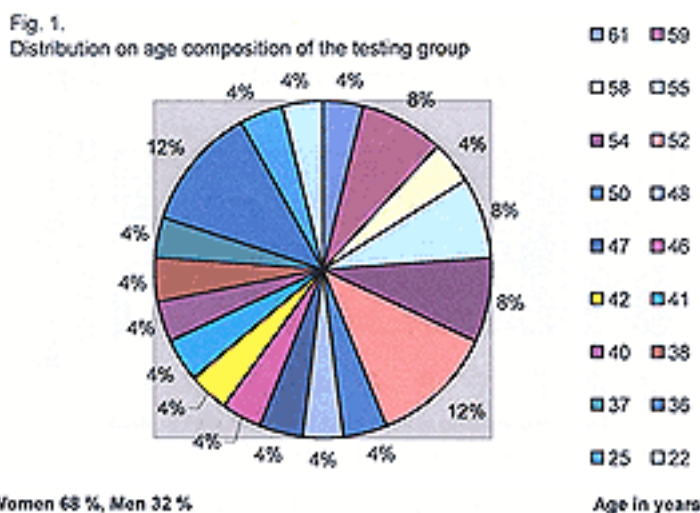
## TREATMENT OF ACUTE TENNIS ELBOW WITH TRANSCUTANEOUS NERVE STIMULATION (TNS)

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In 1965 Melzack and Wall (1) introduced the so-called "gate-control" theory of electrical current affecting the nerve fibres. Such stimulation causes the release of endorphin in the hypothalamus which gives relief of pains especially in the musculo-skeletal system.

Following this theory more clinical trials were performed (2, 3, 4, 5, 6). All materials showed different but always positive results concerning the pain relieving effect of TNS. The trials were performed with technical different equipment but they all involved placing electrodes on different parts of the body. Pain®Gone is a new piece of equipment developed in order that the patients themselves can treat different painful disorders. It is designed as a plastic unit (the size of a big pencil) in which the electronics and the crystals are placed. Pressing a button on the top results in activating the built-in high-voltage generator. The voltage is 15,000 volt (0.000006 ampere) and the frequency is 1-2 Hz (low frequency).



### METHOD:

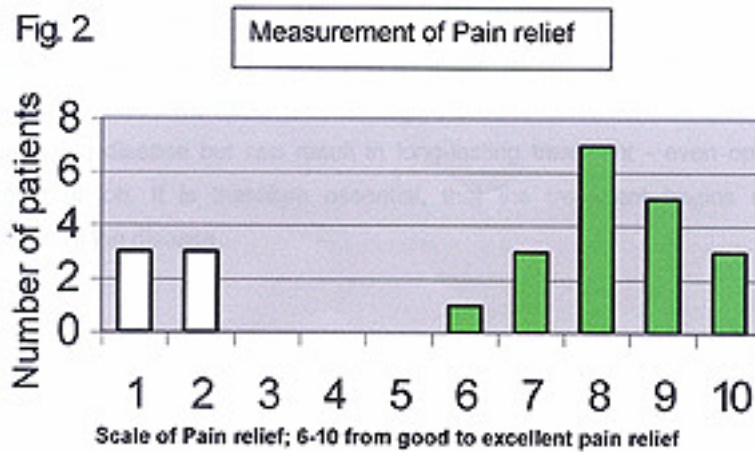
Pain®Gone was tried in 25 consecutive patients with acute tennis elbow (epicondylitis lateralis and medialis humeri) 50% of the patients had 25 clicks over the most painful area while the other 50% was treated with an equal amount of clicks 15 cm above the most painful area. The treatment was given every day until satisfactory result or until the treatment showed useless. There were not given any other medical treatment (painkilling medicine or plastering the elbow).

Fig. 1 shows the age of the patients. The trial lasted 9 months from December 1997 to August 1998. After the treatment the patients were questioned about the painkilling effect using the Huskinson analogue scale (7) where patients themselves shall point out the effect in a scale from 1-20 as 1 referring to no effect and 20 to total relieve of the pain. The scale has in this trial been modified to a scale going from 1-10.

**RESULTS:**

There were 29 patients in the trial. 4 patients did not want to go on with the treatment after the first session and asked for medicine (painkillers) or other treatment. They are therefore not admitted to the trial. There were 6 patients who did not feel any relief at all while 19 patients after 3-5 days of treatment had an effect ranging from 6-10 in the scale. The majority of the relieved patients pointed to 8 in the scale which they explained as a good pain-relieving effect but still with a slight sensation of pain. 5 and 3 patients pointed to 9 and 10 in the scale which means no pain at all. This means that 76% of the patients in the trial had effect ranging from good to excellent pain relief.

On questioning the patients during control and new treatment all 25 patients told that the pain left after 5-15 minutes after treatment and the pain returned after 3-6 hours after treatment. This could mean that TNS has an effect which is on the same level as for painkilling tablets. There was no difference in the effect whether the stimulation was made 15 cm above the elbow or on the most painful spot.



**DISCUSSION:**

“Tennis elbow” and “golf elbow” are very common diseases. It is in most cases caused by trivial movements of the underarm and elbow (playing golf or tennis, using tools as screwdrivers or as often seen today working with a mouse or being cashier in a supermarket). The pathology is not fully known, but there might be an inflammation where the tendons are inserted on both sides of the overarm (humerus) within the elbow area. Some explanations have been given as to that the soft-tissue is damaged or there can be damage of the tendon fibers.

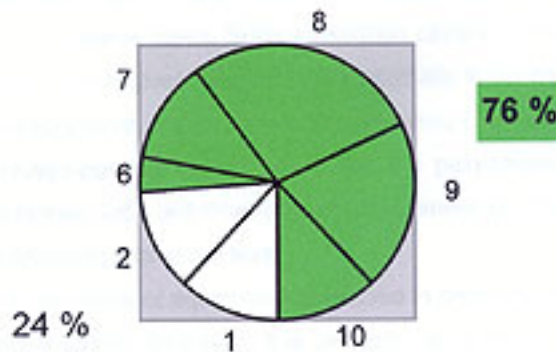
Many treatments have been used from medical treatment with painkillers or treatment with NSAID-drugs (drugs mostly used for rheumatism) to intensive physiotherapy. Another treatment is with injections of steroids in the point where the tendons are attached to the overarm.

Treatment of the acute tennis elbow is essential, as many patients - who are not treated in the acute phase - will develop chronic symptoms. Chronic tennis elbow is not only a discomforting disease but can result in long-lasting treatment - even operation - and changing of job. It is therefore essential that the treatment begins after the first symptoms of the disease.

## CONCLUSION:

As TNS in trials has shown effect on pains in tennis elbows a new equipment - Pain@Gone - has been tested in 25 patients with acute disease.

Fig. 3.  
Measurement of Pain relief



76% of the patients had relieving effect after 3 - 5 days

Most of the patients explained that the effect started minutes after treatment and lasted for some hours. Pain@Gone is effective as painkiller in acute tennis elbow and is a good supplement to other treatments. In the trial there were not observed any side effects at all.

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