

# Mediracer - Helping people



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I/2007



**MEDIRACER®**  
**CTS TEST DEVICE**

**Positive user experiences  
in Scandinavia and in UK**



## ● CARPAL TUNNEL SYNDROME (CTS)

# WIDESPREAD INTERNATIONAL DISEASE OF THE WORKING-AGE POPULATION

According to international epidemiological studies, the incidence of carpal tunnel syndrome is 3% in men and 5% in women. We also know that up to 15% of the population suffer from CTS-like symptoms such as numbness, tingling, pain, weakness or clumsiness in the hand! Over 80,000 people suffer from these symptoms in Helsinki region alone. Every year, 190 women and 90 men / 100,000 inhabitants are diagnosed with CTS which is which is 3 ‰ (per mille) of the population.

According to our own Finnish data (n=3,572), most incidences of CTS occur in working-age population. 84% of the patients are between 25-64 years old (average age 52 years). The diagnosis is twice as common in women as in men (ratio 2:1). The same age and gender distributions can be found in other countries as well.

## Diagnostics of CTS

There are no international golden standard criteria for diagnosing CTS. Typically, the diagnosis is made based on each patient's typical symptoms, clinical findings, and neurophysiological tests. In Finland, neurophysiological tests are always done before deciding on surgery. EMG test for suspected CTS cases is the most common or the second most common single test in both public and private laboratories (20-40% of all EMG tests).

## Many Days Of Sick Leave, Many Surgeries

About 1‰ of the population get surgical treatment for CTS, and in over 20% of the cases both hands are operated. In the USA there are about 400,000 CTS operations / year, in the UK about 50,000 operations / year and in Finland about 6,400 operations / year. In Finland the average waiting time for surgery in 2005 was almost four months. The CTS operations alone account for 22,000-32,000 weeks of sick leave / year among the working-age population. 3‰ of the population get conservative treatment or go undiagnosed. Waiting for tests causes unnecessary delay for treatment and days off from work.

There is no detailed research on how many days of sick leave waiting for tests and treatment cause altogether. The total costs of the sick leaves to employers (in loss of production, hiring and

training substitutes, overtime, etc.) are not known.

## Mediracer® CTS Test Device – Savings by Changing Diagnosing Processes

Damage to the median nerve associated with CTS can be detected with a small, mobile test device innovated by Finnish neurophysiologists. Now these diagnostic tests can be performed in municipal health centers, occupational health centers, surgical or psychiatric outpatient clinics and in those private medical centers that treat patients with CTS. Patients no longer need to travel far to have the test done or wait for months for a test time. Treatment decisions can be made quickly. Mediracer is also a good instrument for following-up on conservative treatment. Since the acquisition and operating costs of this Finnish test device are low, it is clear that the Mediracer system significantly lowers the costs of CTS.

Mediracer is a unique innovation in Europe, and it was CE approved in February 2005. The Finnish Funding Agency for Technology and Innovation (Tekes) and the Employment and Economic Development Center (TE-Center) have supported Mediracer's product development and internationalization from the beginning. Now is the perfect time to go global.



Innovative Regards,  
**Veijo Lesonen**  
 Managing Director  
 Mediracer Ltd.

PS Freelance Writer Ami Jatila has written the customer news and taken the pictures during fall 2006.

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## Customer News: The Districal Joint Municipal Authority of Health Care in Raahe, Raahe Hospital

# GOING TO THE RIGHT DIRECTION

### Raahe-Oulu-Raahe 150 km

I'm going to the right direction! This was the thought on my mind when I saw a pedestrian with an arm in a sling.

I had never been to Raahe before, but I knew I was headed to the right direction with the sea on the left and the beach-side boulevard leading towards a low building – a hospital. I parked my car and went inside.

- "Hi, sorry for the mess, we're in the middle of renovation" nurse Anne Mattila and medical technician Hannu Syngelmä greet me as I walk in.

Chief physician Virpi Honkala had revealed the topic of my curiosity to the receivers: What are the experiences on Mediracer?

- No need for unnecessary trips to Oulu, Syngelmä said with a smile knowing where I came from.

### A Common Problem

A sore wrist is a common problem among middle-aged Finns and many years can pass by before the patient feels such discomfort that he or she consults a doctor.

- Mediracer is a good device when CTS is a possible cause of the problem, says Mattila who has been using Mediracer for a little over a year.

Hannu Syngelmä has been using Mediracer since it was acquired to Raahe hospital, and he has complete faith on the device.

- It has been 100% accurate. Every time the test result has been positive, we have started treating CTS, says Syngelmä.

### Fast Test During a Single Consultation

Virpi Honkala, Chief Physician of the Districal Joint Municipal Authority of Health Care in Raahe, has a concrete example of Mediracer's accuracy and reliability.

- A patient came for a surgery consultation due to foot problems and also mentioned that he had clumsiness and pain in the hand. Clinically, the symptoms seemed to fit those of carpal tunnel syndrome, so I decided on a Mediracer test and we agreed to talk about the results over the phone. However, the nurse brought me the Mediracer test results in about 10 minutes. The result was clearly positive and we scheduled a time for surgery right away, says chief physician Honkala.

Nurse Anne Mattila remembers this case very well and states the obvious: - The test device

can come to the patient and we get the results right away.

Medical technician Hannu Syngelmä has received positive and encouraging feedback and



similar comments on the test

- People have been very happy with a quick test. Many people are scared of needles, so the lack of needles makes this a good test, Hannu says with a smile, but yet seriously.

Even if many patients have suffered from symptoms for a long time, they don't want to wait for tests when they have come to the doctor to show their hand.

- The waiting time for traditional CTS test is weeks, even months. And everyone doesn't have a car, so many people would need to take the bus to Oulu and lose at least one day of their normal program, Hannu says.

### Practice Makes Perfect

Like Anne Mattila, Syngelmä is convinced of the accuracy of the test device and he feels that the speed combined with the accuracy benefits all parties.

- The technician's eye is quickly trained to read the nerve conduction study, and the patient gets the results and treatment plan quickly. Any information, such as surgery, physiotherapy or even eliminating the possibility of CTS, helps to move forward.

- The problem is tested quicker or the physician is able to move on to other possible causes of the

problem if the possibility of CTS is eliminated. Even a decision on surgery brings ease to the patient and his or her employer.

After a positive Mediracer test, there is a consultation with a doctor who

will decide whether surgery will be needed.

Chief physician Virpi Honkala says that patients are referred to the hospital's surgical unit to confirm the diagnosis of a clinical examination.

- Patients have often suffered from symptoms for a long time, even years. Mediracer not only saves testing costs, but also time and effort that it takes to travel elsewhere, Honkala says.

Honkala feels that customers (patients) are the biggest "winners" of the test.

- Patients are happy with fast, simple, and reliable diagnostics. Based on my experience, I can definitely recommend POC diagnostic testing device, says chief physician Honkala.

### The Districal Joint Municipal Authority of Health Care in Raahe

- There are 32,000 inhabitants in the region, and, due to the expansion of services in specialized health care, there are also customers from the southern parts of Oulu.
- The budget is about 35 MEUR.
- A staff of 740 with 31 health center physicians and 32 specialists.
- Yearly, over 50,000 medical consultations (municipal health center), 12,000 in occupational health care, over 19,000 in first aid, and over 28,500 in hospital's outpatient clinics.



**Customer News: The Districal Joint Municipal Authority of Health Care in Vieska, Occupational Health Care, [www.vieskantk.fi](http://www.vieskantk.fi)**

## MAARIT KUKKOLA AND HANNELE RANTALA ARE COMFORTABLE USING MEDIRACER

Occupational health nurses **Maarit Kukkola** and **Hannele Rantala** of Ylivieska's occupational health care services are experienced Mediracer users. They have been trained to perform Mediracer tests, and they do all the tests related to carpal tunnel syndrome.

In practice, both of them have their own test day once a month, of course more often when needed.

The nurse attaches disposable surface electrodes on the patient's wrist and fingers, and many clients confess that they were expecting something worse:

- Many people say that this is much nicer than using needles, says Maarit Kukkola.

At the beginning of the test most people are a little nervous.

- I touch the client on the shoulder and ask him or her to relax. It usually works and we get the cor-

rect results right away. We show the results on the computer screen and then print them out.

- After this, the doctor will interpret the results and decide on further actions, says Kukkola and refers to occupational health physician **Osmo Konu**.

The occupational health care services of Ylivieska serve about 5,500 customers. There are three doctors and five occupational health nurses to "look after" these people.

Both outpatients and customers of occupational health care have a referral from their doctor. The test results are forwarded to the doctor who will decide on further actions.

### Satisfied Customers and Employers

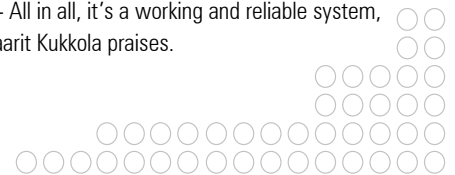
- People have been satisfied in many ways. Customers are happy to have the test done in Ylivies-

ka. Employers are also happy with the benefits of the Mediracer test, such as short test time (20 minutes) and results that are available right away. It is in everyone's interest that we know as quickly as possible how long the future treatment will take and when the patient is able to go back to work again, says Maarit Kukkola.

- If the doctor recommends the operation, the surgery will usually take place within a few weeks, Kukkola specifies. Maarit Kukkola feels that the Mediracer user training has been sufficient and beneficial.

- We have learnt well and continuous use brings confidence. Using the test device requires no neurophysiological skills, Maarit says with a smile.

- All in all, it's a working and reliable system, Maarit Kukkola praises.



**Customer News: The Districal Joint Municipal Authority of Health Care of Six Municipalities, Alavus, [www.6tk.fi](http://www.6tk.fi)**

## BENEFITS WITH CENTRALIZATION

The municipalities of Alavus, Kuortane, Lehtimäki, Soini, Töysä, and Ähtäri form a districal joint municipal authority of health care and the health services have been centralized in the main municipal health center of Alavus and in Ähtäri.

- The purpose of the unification is clear: the organization functions better and we are one, not six, separate groups, simplifies **Erkki Kesti**, the director of the joint municipal authority of health care.

There are altogether 29,000 inhabitants on the region of these six municipalities and there are about 30 doctors serving and treating them. The total amount of staff including substitutes is about 550.

The most important projects of the six joint municipalities are to bring the strengths of each municipality together and make the organization function better.

- The budget for our first year of operation is 26.7 MEUR, answers Kesti when asked about the budget and adds that, on average, each inhabitant uses health services 2.1 times per year.

Erkki Kesti, The Director of the Joint Municipal Authority of Health Care and Medical Director, has acquired Mediracer CTS test device for the main municipal health center in Alavus, where the device is mainly used.

### New Test Method Requires Practice

The test device can be easily moved so it can also be used elsewhere.

- It is used daily at the municipal health center of Alavus, but it can be easily moved, Kesti says.

Kesti believes that the best benefits will be achieved when the staff learns to use Mediracer and there will be more user experience.

- The better we familiarize ourselves with the device, the more benefits we get from it. The goal is that through experience we will reach a fast and reliable way of diagnosing CTS. We get the reports on the results faster than before, and we can decide on further actions: will the wrist benefit from exercise or is surgery needed, says Kesti.

According to Kesti, it is important that the device is used regularly and that as many people as possible learn to use it. Because it is easy to use and the results are reliable, Mediracer will be even more commonly used in every day testing.

- I believe that the old test methods will be used less in the future and more and more doctors will use Mediracer to test patients suffering from CTS-like symptoms, says Kesti.

### Extended Job Description for an Occupational Health Physiotherapist

Occupational health physiotherapist **Riitta Roth** is an experienced Mediracer user.

- Mediracer has made examining symptoms and finding out the causes easier.

- Eliminating the possibility of carpal tunnel syndrome is also important information. Then we are able to refer the patient to other types of tests, says Roth.

- Many people have been happy that needles are not used and that they don't have to go anywhere else to have the test done. We have been able to examine the sore wrist right away and to give information on the test results immediately if the nerve conduction study has been ok, says Riitta Roth.

- This has made my job more interesting and expanded my job description. Once you have been given a good orientation into using the device and you get support when needed, Mediracer is a big help in diagnosing hand problems, Riitta assures.

● **Customer News:** Leicester General Hospital, United Kingdom

## COLLABORATIVE RESEARCH CONFIRMED THE SUITABILITY OF MEDIRACER ALSO IN ENGLAND

Already in the product development phase of Mediracer in 2003-2004, Finpro (www.finpro.fi) surveyed on our behalf the market for health care in the United Kingdom. As a result of their survey, we received an enquiry by e-mail from the Leicester General Hospital in 2005. "How is it going with your CTS device?" The sender of the message was Malcom Clarke, Operating Nurse Specialist Orthopaedics. After answering that our system had already been approved for sale in the EU, we made an appointment in Oulu for November 2005.

### Collaborative Research Begins

During the meeting in November 2005 we demonstrated the possibilities of Mediracer to our English guests as well as Malcom and Orthopaedic Consultant **Timothy Green**. They wanted to familiarize themselves in more detail with the suitability of Mediracer in their operations. This is why we founded the Anglo-Finnish CTS Study Group and convinced the ethical board of Leicester hospital to approve our research plan. The first part of the research was carried out in February 2006 and the follow-up in September 2006.

### The Object of the Research

In the first part of the research (pre-operatively) we examined the suitability of Mediracer to diagnose CTS in outpatient clinics as well as the sensitivity and specificity of the device compared to the traditional EMG tests performed by specialists in neurophysiology.

In the second part of the research (postoperatively) we examined the suitability of Mediracer for following-up on treatment in the same group of patients using a corresponding comparison. Patient data consisted of 63 clinically diagnosed CTS patients. The scientific report will be published later.

### Cost-effectiveness with Changes in the Diagnosing Process also in the Health Care of England

During our visits to Leicester we were able to familiarize ourselves with their re-organized test and treatment processes for CTS patients. The process change had already started in 2002 when the idea was to focus the testing and surgical treatment of all CTS patients into one place in Leicester General Hospital (One-stop service CTS clinic). Further organizational changes took place when Operating Nurse Specialist Malcom Clarke was trained to



run the clinic (Nurse-led service). The UK National Health Service (NHS) approved the change in quality control and responsibility issues. Now all the General Practitioners of the region can refer their patients for consultation at the CTS clinic in order to confirm the diagnosis, arrange the treatment, and follow-up on the progress.

The clinic's biggest problem has been the poor availability of neurophysiological tests, and, in many cases, they have not been done at all. The Mediracer system will clearly make the treatment process at the CTS clinic faster and better both qualitatively and financially.

### Nurse-led service

Every year Malcom performs about 850 CTS surgeries independently using local anesthetic, meets 1,100 new patients and receives 1,200 patients for follow-up (such as removing stitches). The CTS patient will get treatment within 12 weeks of the arrival of the referral to the clinic. Patients return to work on average four days after the surgery! The CTS clinic operates under the orthopaedics clinic, and it is responsibly supervised by four orthopaedic consultants of the hospital. Up-to-date Malcom has operated over 3,000 CTS patients independently.

Translated from the original Finnish text written of Veijo Lesonen MD.

Further information on Nurse-led service:

*Nurse-led management of carpal tunnel syndrome: an audit of outcomes and impact on waiting times.* Newey M, Clarke M, Green T, Kershaw C, Pathak P. Department of Orthopaedic Surgery, Leicester General Hospital, Leicester, UK. *Ann R Coll Surg Engl.* 2006 Jul;88(4):399-401.



Customer News: Atria's Occupational Health Care, Nurmo, Finland

# INTERNATIONAL FOOD PROCESSING COMPANY WHICH CARES FOR ITS EMPLOYEES

Kauhava, Lapua and Nurmo. Can one get even further north by following the road signs? The road to the Atria factory, located in Nurmo, is well marked and there is no danger of getting lost.

Nurmo is famous for wrestlers and baseball players, but now we are talking about the employees of Atria who work with their hands.

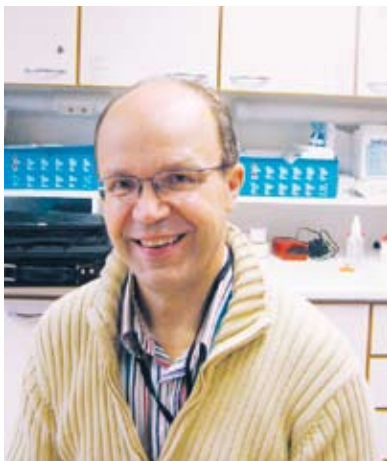
It is a well known fact that Atria's occupational health care is in good hands. It consists of a team of six: one doctor, three nurses, an occupational health physiotherapist, and a secretary.

On the 2nd floor, in the occupational health care room, there are two smiling Atria employees that are in a good mood. The busier of them, Assistant Professor and Chief Occupational Health Physician, **Markku Seuri**, is the first to answer questions:

- In food industries, especially in the meat industry, the rate of visits to the doctor is high. The work is physical and heavy. Including yearly physical examinations there are over 5,500 medical consultations per year in Atria in the Nurmo and Seinäjoki region, Markku says.

## Occupational Health Measures in the Right Direction

Markku Seuri is satisfied with the direction of Atria's occupational health care. – Currently, we are working on several basic projects such as renewing job descriptions and getting more benefits from them, improving the premises and operations of occupational health care, transferring first aid training to our own occupational health care staff, recognizing disabled workers and developing rehabilitation, participating in accident prevention, improving reporting processes, etc.



Professor and Chief Occupational Health Physician Markku Seuri

Seuri is satisfied with Mediracer. We have used Mediracer for diagnosing CTS since May 2006.

- The device has enabled us to diagnose CTS in its early stages or rule it out as the cause of the symptoms. It has also made the treatment faster and decreased the time waiting for treatment, Seuri says.

- I believe that it is beneficial to use the device even more sensitively, because the faster we diagnose this type of problem, the better it is.

Seuri does not understand why Mediracer is not used more elsewhere.

- I haven't seen a single inconsistency between Mediracer and the traditional EMG. When an occupational disease is suspected, Mediracer is great for screening patients going for EMG tests, Seuri says and reminds that the device saves time and money.

## Mediracer Has Received Good Feedback

Atria's occupational health physiotherapist, **Tuija Hantula**, agrees with Seuri's opinion.

- We work hard with our hands and wrist problems are quite common, Tuija Hantula says..

- In the past, customers have received instructions such as night splint, exercise and stretching, but the problem often persists or new problems arise due to using the painful hand differently. Now we are able to get to the root of the problem faster.

- Mediracer has made diagnosing CTS and getting treatment faster. It is clear that faster diagnosis reduces lost work time and saves money, Tuija Hantula says.

Tuija has her view on using Mediracer

- Good guidance has taught to use the device and using it maintains competence. Customers have been happy with the fast results, and they are clearly more enthusiastic about exercising and thinking how they use their body. Many have wanted to check the other wrist as well, Hantula says with a smile.

## There Will Be Demand For The Device

Tuija Hantula believes that Mediracer will be increasingly used in occupational health centers in the future.

- The device is especially useful in sites where there are a lot of employees who work with their hands.



Occupational Health Physiotherapist-Tuija Hantula

Doctor Seuri agrees.

- The device is excellent! As I said, there are no inconsistencies between the results of Mediracer and EMG, Seuri reminds and thinks that the use of Mediracer causes some conflicts between the representatives of different schools of medicine .

- Some specialists in clinical neurophysiology are afraid that the device will replace the traditional EMG test, Seuri says.

I think we should see Mediracer as complementary to the need, Seuri emphasizes. The use of Mediracer could help make the diagnosing process faster. Treatment process would become shorter leaving space for tests or offering time and resources for more serious cases.

## Atria Group Plc, Nurmo

- Atria is the biggest employer in the Nurmo-Seinäjoki region with an average staff of 2,000. However, there are some notable seasonal changes.
- Atria's Occupational Health Care in Nurmo employs one doctor, three nurses, an occupational physiotherapist and a secretary.
- In food industries, especially in the meat industry, the rate of visits to the doctor is high because the work is physical and heavy.
- There are over 5,500 consultations yearly..

[www.atria.fi](http://www.atria.fi)



## MEDIRACER R&D NEWS

The data transfer from the Mediracer CTS device to PC will work with Blue-tooth in the future. No other technical changes will be made. The graphics of the device will be updated to correspond to the company's current image (forms and color scheme). A new addition is a desktop charger that will be delivered with the device. In the charger, the device is always ready to use and the battery will be charged automatically. The electrodes have also been re-designed and their user-friendliness has been improved with some minor changes. The carry case will also be renewed and it will include a space for the new desktop charger.

The biggest changes will be in the software to be installed on your own computer. Based on user feedback, certain routine functions will be made automatic, and the usability of the program will be improved. In addition, reading the test results on another computer linked to the same network will be enabled. It will be easy to get a second opinion from a specialist directly through the Mediracer program. Current users will be able to download the new version of the program free of charge from the company website after a separate notice.



### SPEED AND COST-EFFECTIVENESS FOR HEALTH CARE WITH A CHANGE IN THE SERVICE PROCESS

The test method developed by Finnish neurophysiologists is also:

- **Easy to use**  
Using the device does not require special competence in neurophysiology.
- **Painless**  
The test is done using specially manufactured surface electrons that are attached to the skin.
- **Sensitive**  
Confirmed by clinical studies: sensitivity 94% and specificity 98%.

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[www.mediracer.com](http://www.mediracer.com)

### Carpal Tunnel Syndrome Is a Common Problem

Up to 15% of adult population suffer occasionally from symptoms associated with carpal tunnel syndrome and the therapy results of long-lasting untreated CTS are poor. Testing a patient suffering from CTS-like symptoms with Mediracer is **easy, fast and cost-effective**.

*For more information and to find your local distributor visit our web site or e-mail us: [info@mediracer.com](mailto:info@mediracer.com) .*

 **mediracer**  
POINT OF CARE DIAGNOSTIC TESTING