



**NEUROMODULATION**  
Health care



# SPINAL CORD STIMULATION

Neuromodulation Center



## What is Spinal Cord Stimulation treatment?

Spinal cord stimulation treatment, popularly known as spinal cord stimulation, is based on the logic that the electric current applied through an electrode (electric cable) placed on the spinal cord membrane prevents pain from being felt. The sensation of pain coming from the leg, arm or body is transmitted via the spinal cord to our brain, which will perceive this sensation. This travel of these signals towards our brain is blocked by spinal cord stimulation, that is, by the spinal cord stimulation placed on the spinal cord membrane, thus preventing the nervous system from transmitting the pain to the brain, which should not actually occur, at the spinal cord level. In short, even if the pain caused by some disruptions in this nervous system continues, it cannot be transmitted to the brain, so it is not perceived, that is, the feeling of pain disappears.



The most important point here is that there should not be a condition that can be eliminated by surgery. In other words, if the patient has a herniated disc that needs to be operated on and the cause of the pain is this herniated disc, the patient should undergo herniated disc surgery, not spinal cord stimulation surgery. In our country, it is applied in the treatment of treatment-resistant chronic pain and is a highly effective treatment method.

## **How is Spinal Cord Stimulation Surgery Performed?**

- With the awake needle method;
- By incision method under anesthesia.

### **Spinal Cord Stimulation Surgery with Awake Needle Method**

If there is no previous surgery in the spinal cord area and your surgeon has sufficient experience in this area, we recommend this method, which can be performed awake and with the help of a needle under local anesthesia.

In this method, which is performed with local anesthesia while the patient is awake, the patient is first placed face down on the operating table and after the necessary local anesthesia is performed, a medium-thick needle is inserted into the spinal cord membrane with the help of a mobile X-ray.

After making sure that we are on the spinal cord membrane then with the help of this needle, electrodes (cables) are attached to the spinal cord. It is placed on the membrane and advanced to where it needs to be.



## **By incision method under anesthesia**

In this type of surgery, after the patient is falling asleep, that is, under general anesthesia, the patient is placed face down on the operating table and then the skin is cut in the area related to the areas where the pain occurs, the spinal bone lamina is exposed, the bone lamina is removed with assistive devices and the spinal cord membrane is exposed. The electrode is then placed directly on the membrane, the cables are connected to a temporary pulse-generator and the patient is discharged and taken into the testing process.

After this process is completed, the cables are connected to a temporary pulse generator and the patient is discharged and taken into the testing process. At the end of the test period, if the patient states that he/she has benefited, a new permanent pulse generator is placed under the skin in a very short procedure under local anesthesia. After the placement of the permanent pulse generator, there is no device left outside and everything is embedded under the skin. As you may have noticed, in this type of intervention, the patient is not asked if he/she can feel the electric current because he/she is not awake, so the cables are placed in an estimated or average location.





## Who can undergo Spinal Cord Stimulation surgery?

Among the people who will benefit from spinal cord stimulation treatment, we can count the following:

- In the treatment of low back, leg and neck pain called failed back or neck surgery syndrome, which does not go away after lumbar or cervical hernia or similar surgeries;
- In the treatment of diabetic neuropathy, which is the burning, freezing, cold and pain in the feet and hands caused by diabetes and resistant to drug treatment;

- Peripheral vascular pain, that is, in drug-resistant pain due to wounds or disease caused by vascular disease;
- In drug-resistant pain, known as phantom disease in medical language, which is felt at the site of the amputated limb and is physically impossible to be physically impossible;
- In Buerger's disease; especially in limb (hand, arm, foot, leg) pain seen in smokers and in the pain of the amputated limb;





- In drug-resistant pain due to cancer disease;
- In complex regional pain;
- In Reflex Sympathetic Dystrophy;
- In the treatment of pain in individuals with spinal cord injury;



# How to Decide on Spinal Cord Stimulation Surgery?

The decision to perform the surgery is made by a committee consisting of Neurosurgery, Algology, Physical Therapy and Rehabilitation and Psychiatry physicians. All members of the committee first examine the patient, and if it is observed that the drug treatment is no longer sufficient or the use of medication causes side effects, it is decided to perform a test intervention. If the patient declares that he/she has benefited from the test procedure, the decision is made to implant a permanent pulse generator. Test application can be counted among the biggest advantages of this surgery. In this way, it is clearly understood whether the person will benefit from this surgery.





## **What are the Benefits of Spinal Cord Stimulation ?**

- Performing the test procedure beforehand clearly reveals whether the patient will benefit from this treatment.
- Since the test procedure and the permanent placement of the stimulation are performed under local anesthesia (regional anesthesia) does not have the risks that general anesthesia has.



- Thanks to the remote control, programming can be done at any time and the device can even be turned off completely if desired.
- The amount of painkillers taken orally is significantly reduced, preventing side effects of medication.
- The pulse generator is rechargeable and can last up to 15 years.



## What are the risks of Spinal Cord Stimulation surgery?

### Risk of infection

The dose of antibiotics to be given before surgery and during surgery can be significantly reduced by paying utmost attention to sterilization conditions.

### Possible damage to the Spinal Cord

The rate of occurrence of such risks is very low and in experienced hands, the probability of occurrence is almost negligible. If damage is caused to the spinal cord membrane, it can cause weakness or pain, as well as leakage of cerebrospinal fluid, so it is recommended that this procedure should be performed in experienced hands.





# Our Services

You can be sure that you will receive the best service during your treatment. If you decide to visit our center, we are offering a complete treatment package.

The package includes:

- **Full examination of the patient by all necessary specialists;**

- \*Neurologist,
- \*Neurosurgeon
- \*Psychologist
- \*Anesthesiologist
- \*Nutritionist
- \*Cardiologist
- \*Physical Therapy and rehabilitation specialist.



- **Establishing the correct diagnosis before the surgery.**
- **Discussion the expectation with the patient and patient's relatives**

- **All laboratory and Radiological examinations;**

- Serological evaluations
- Chest Radiology
- Necessary blood tests
- 2 times Whole Brain Computerized Tomography (preoperative for planning and postoperative for electrode position checking) Under sedation
- Detailed Whole Brain Cranial MRI (under general anesthesia for higher quality of images).



### Deep Brain Stimulation Surgery includes:

- Necessary equipments for the surgery (FDA approved )
- All necessary medication
- The work of the medical team led by **Dr. ATILLA YILMAZ**
- Postoperatively daily DBS system check and wound care.
- Postoperatively daily DBS programming
- Post-operative rehabilitation and physiotherapy exercises.
- Walking and occupational therapy

These services are available as standard in all our service packages, service packages including extra services are also available.



## Our services also includes:

- 7 DAYS at the hospital for the patient and his/her two relatives.
- 7 DAYS accommodation at the hotel for the patient and his/her relatives during the rehabilitation and physical therapy period.
- Three meals a day for patients and his/her relatives during the stay (hospital and hotel).
- Transfer to and from the airport.
- Airport - Hospital transfer Hospital - Hotel transfer After discharging Daily Hotel - hospital transfers.
- Long-term Postoperatively online consultations (for 2 years).
- Your treatment will continue for approximately 14 DAYS. Experienced staff and translators will be with you at every stage of your treatment. They will give you all the support and attention you need.





# Transfer

When you land at the airport in Turkey, we welcome you with a V.I.P transfer vehicle. A comfortable journey awaits you from the airport to our hospital with our transfer vehicle. And after your treatment is completed, we drop you back to the airport.

**‘We provide the best transfer and accommodation opportunities for you.’**

During the 2 weeks period here, you will stay in our hospital for the first week to monitor your medical process. In the second week, we provide accommodation in the hotel located in an area close to our hospital so you can come everyday for dressing, examination, and stimulation programming.

We have two different hotel options. in standart package you will have room in a 3-star hotel with suites. Additionally you can upgrade your package with 5-star hotel with standard rooms. During these stays, 2 relatives of our patient can accompain.

# Hotels

# Post operative Rehabilitation

For every patient we provide physical therapy and Psychological support at the hospital and hotel.

Physical therapy is very important for patients who have difficulty in walking or moving for a long time due to their illness.

Physical therapy is applied to correct posture, walking, and muscle imbalance, to increase mobility and endurance. It may include point therapy to reduce stiffness and relieve pain, in addition to strenuous therapy exercise to strengthen the joints, mobilize them, and restore soft tissue.

We also support our patients by psychological evaluation and therapy.

# Food

Our package also includes 3 times meal per day for the patient and 2 relatives, and also we prepare some traditional surprises, and welcoming snacks.

**Our center and our Professor have provided training opportunities on Neuromodulation surgeries to 25 countries named below.**

**Our professor**

**Assoc.Prof. Dr. Atilla YILMAZ**

**has contributed to the realization of such surgeries in all these countries.**

- Germany
- Azerbaijan
- United Arab Emirates
- Algeria
- Morocco
- South Africa
- Georgia
- Croatia
- Iraq
- Iran
- Qatar
- Kazakhstan
- Kyrgyzstan
- Libya
- Lebanon
- Egypt
- Mongolia
- Moldova
- Uzbekistan
- Pakistan
- Romania
- Russia
- Saudi Arabia
- Tajikistan
- Jordan

**Our professor**  
**Assoc.Prof. Dr. Atilla YILMAZ** has  
successfully operated more than 500  
patients from 30 different countries in  
terms of neuromodulation surgeries.

- Germany
- Austria
- Azerbaijan
- Bulgaria
- Algeria
- Palestine
- Georgia
- Netherlands
- Iran
- Iraq
- Kazakhstan
- Kyrgyzstan
- Kosovo
- Kuwait
- Turkish Republic  
of Northern Cyprus
- Libya
- Lebanon
- Mongolia
- Nigeria
- Uzbekistan
- Pakistan
- Russia
- Saudi Arabia
- Serbia
- Syria
- Tajikistan
- Tunisia
- Turkmenistan
- Ukraine
- Jordan

# NEUROMODULATION

Nerve

Regulator

Neuromodulation, which literally means regulating the nervous system, consists of 5 different surgeries applied on different diseases.

## Deep Brain Stimulation

Parkinson's  
Dystonia (involuntary movement and contraction)  
Essential Tremor Treatments



## Spinal Cord Stimulation

Diabetic Neuropathy  
Back or Neck Surgery  
Pain Due to Vascular Diseases (Bueger)  
In the treatment of pain (phantom) resulting from the amputation of a certain limb

## Sacral Stimulation (Bladder Stimulation or Hip Stimulation)

Urinary Incontinence, Failure to Urinate, Inability to Urinate,  
Incomplete Urine Discharge,  
Frequent urination  
Involuntary incontinence of flatulence  
Interstitial Cystitis, Pelvic Pain, Chronic Constipation  
Neurogenic Bladder Treatments



## Vagus Nerve Stimulation (Epilepsy)

Epilepsy resistant to drug treatment

## Baclofen Pump

In the treatment of involuntary contractions (Spasticity)



**All these Neuromodulation Interventions are successfully applied in our Center.**



neuromedulationcenter



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