Solutions for chronic disease
About Medtronic

Medtronic is the world’s leading medical technology company, providing lifelong solutions for people with chronic disease.

With deep roots in the treatment of heart disease, Medtronic now provides a wide range of products and therapies for the treatment of cardiovascular disease, Parkinson’s disease, diabetes, pain and other neurological and spinal disorders. Founded in 1949, Medtronic serves physicians, clinicians, and patients in more than 120 countries.

The company is headquartered in Minneapolis, Minnesota, USA, and has research, manufacturing, education, and sales facilities around the world.

Medtronic Europe and Emerging Markets
First established in Europe in 1967, Medtronic operations have since expanded throughout the European and Emerging Markets region.

Medtronic’s International Headquarters are in Tolochenaz, on the shores of Lake Geneva, Switzerland. The site is also home to the world’s most technologically advanced manufacturing plant for pacemakers, as well as Medtronic’s European Training and Education Center.

Medtronic has three other major European facilities: a Vascular Manufacturing facility in Galway, Ireland; the Bakken Research Center in Maastricht and the European Operations Center for distribution and shared services in Heerlen, both in The Netherlands.
In 1949, Earl Bakken, an electrical engineering student, and his brother-in-law Palmer Hermundslie, founded Medtronic in Minneapolis to repair medical equipment for local hospitals.

By working closely with physician customers – a key element of Medtronic’s success today as it was back then – Earl Bakken and Palmer Hermundslie went on to design and build new medical devices. In 1957, Earl Bakken developed the first wearable external battery-powered cardiac pacemaker, and created an entirely new industry. By 1960, Medtronic products were sold and used in Australia, Canada, Europe and Latin America.

Before the pacemaker, the only treatment for failing hearts was marginally effective drug therapy. Today, biomedical engineering is helping to create revolutionary new therapies to change the course of human disease.

The combination of research and development plus strategic mergers and acquisitions has enabled Medtronic to continually improve and expand its product lines and to enter new markets. From what was originally a ‘one-product enterprise’, Medtronic has evolved into a global leader, with an array of technologies and products designed to alleviate pain, restore health and extend life.

An essential part of Medtronic’s Mission is "to maintain good citizenship as a company". Both Medtronic and the Medtronic Foundation support a number of worthy initiatives that contribute to the vitality of local communities and improve the health of people in the European and Emerging Markets region.

Medtronic is committed to helping people live healthy and productive lives.
Ireland Manufacturing & R&D Operations
Galway, Ireland
In Galway, Medtronic has a Manufacturing and Research & Development facility for its Vascular Division as well as lead delivery systems used with heart failure devices.

Bakken Research Center
Maastricht, The Netherlands
The Bakken Research Center (BRC) in Maastricht has primary responsibility for Medtronic’s Research & Development, clinical, regulatory and scientific support activities in the region.

European Operations Center
Heerlen, The Netherlands
Located in the south of The Netherlands, Heerlen is hosting Medtronic’s European distribution and financial shared services center.

Dr. C. Walton Lillehei, a pioneer in open heart surgery at the University of Minnesota Medical School, with a child who received one of the early Medtronic external pacemakers.
**Helping people in more Cardiac Rhythm Management**

**Tachyarrhythmia**

**Problem** Heart rates that are too fast or irregular which can lead to sudden cardiac arrest

**Solution** Implantable defibrillators, tachyarrhythmia leads, programmers and software, external defibrillators and ablation and mapping systems

**Bradycardia**

**Problem** Heart rates that are too slow

**Solution** Pacemakers, pacing leads, programmers and software

**Ventricular Dysynchrony in Heart Failure**

**Problem** Unsynchronized beating of the heart, which results in insufficient blood flow to meet the body’s needs

**Solution** Cardiac resynchronization systems including biventricular pacemakers and defibrillators, left ventricular leads and delivery systems

**Unexplained Syncope (fainting)**

**Problem** Temporary loss of consciousness

**Solution** Insertable loop recorders to diagnose the cause of syncope

**Atrial Arrhythmias**

**Problem** Irregular heartbeat where the upper chambers of the heart, the atria, beat Rapidly and inconsistently

**Solution** Implantable atrial arrhythmia management systems, preventative pacing systems, and ablation and mapping systems

**Coronary Vascular Disease**

**Problem** Narrowing or blockage of the arteries caused by deposits of cholesterol or fatty materials on the walls of the arteries, reducing the blood supply to the heart

**Solution** Stent delivery systems, balloon, guiding and diagnostic catheters, guide wires and distal embolic protection system

**Peripheral Vascular Disease**

**Problem** Narrowing or blockage of the arteries outside the heart and weakening and ballooning of the aortic artery (abdominal/thoracic aortic aneurysm or AAA/TAA)

**Solution** Renal (kidney) stent systems, iliac (pelvic/femoral) stent systems, biliary (liver) stent systems, endovascular stent grafts, and distal embolic protection system

**Cardiac Surgery**

**Heart Valve Disease**

**Problem** Disease of the heart valves that limits the heart’s ability to pump blood, including stenosis, or narrowing of valve opening, and regurgitation, when the valve may not close completely

**Solution** Aortic and mitral tissue and mechanical valves and annuloplasty rings and bands.

**Coronary Vascular Disease**

**Problem** Coronary vascular disease which cannot be effectively treated with angioplasty or stents

**Solution** Perfusion systems for arrested heart surgery, heart positioners, stabilizers and distal anastomosis devices for beating heart surgery and autotransfusion and hemostasis management equipment for both solutions.
ways than ever

Neurological

**Parkinson’s Disease**

**Problem** Shaking, stiffness, and slowness of movement caused by degenerative neurological disease

**Solution** Parkinson’s control therapy using brain stimulation system

**Chronic Pain**

**Problem** Unresolved chronic pain of the back and limbs, including ischaemic pain due to severe angina and/or peripheral vascular disease as well as pain caused by cancer or cancer treatment

**Solution** Implantable neurostimulation and drug infusion systems

**Spasticity**

**Problem** Chronic muscle rigidity and involuntary muscle spasms associated with cerebral palsy, multiple sclerosis, stroke, brain injury and spinal cord injury

**Solution** Drug administered by implantable drug infusion system

**Hydrocephalus**

**Problem** Excess cerebrospinal fluid in the ventricles of the brain causing intracranial pressure

**Solution** Implantable shunts, valves and intracranial pressure monitoring systems

**Diabetes**

**Problem** The body’s inability to produce or properly use insulin

**Solution** External insulin pumps and related disposable infusion sets, continuous glucose monitoring systems and implantable insulin pumps

Gastroenterology and Urology Disorders

**Acid Reflux**

**Problem** Gastroesophageal reflux disease (GERD) or very severe heartburn

**Solution** Catheter-free diagnostic system and minimally invasive implantable biomaterial therapy

**Incontinence**

**Problem** Inability to control bladder and bowel

**Solution** Implantable sacral nerve stimulation system

Enlarged Prostate

**Problem** Enlargement of the prostate that obstructs the flow of urine

**Solution** Transurethral needle ablation

Gastroparesis

**Problem** Chronic nausea and vomiting

**Solution** Implantable gastric stimulation system

Ear, Nose and Throat

**Problem** Diseases and conditions affecting the ear, nose and throat, and eye

**Solution** Powered tissue removal systems, nerve monitors, instruments, implants, image-guided surgery systems and portable pressure-pulse generators

**Spinal**

**Scoliosis**

**Problem** Curvature of the spine

**Solution** Thoracolumbar spinal systems

**Herniated Disc**

**Problem** Protrusion of the soft tissue of the disc leading to compression causing pain

**Solution** Microdiscectomy system, cervical and lumbar spinal implants

**Degenerative Disc Disease**

**Problem** Natural aging process leading to a degree of disc collapse often associated with debilitating back and leg pain

**Solution** Cervical, thoracic, and/or lumbar spinal implants, bone graft substitutes and bone morphogenetic protein
Imagine feeling weak all the time, day in and day out. Too tired to do the simplest things such as brushing your teeth or making a cup of coffee. Making frequent trips to the Emergency Room. Perhaps eventually ending up on a transplant list—where you wait, and worry, and wonder. That only begins to describe the life of a heart failure patient. It is estimated that well over 20 million people worldwide are affected by heart failure, with numbers rising rapidly year on year as the population ages. In Western Europe alone, there are already over five million heart failure patients, a number expected to rise to 10 million by 2030. Heart failure is also responsible for more hospitalizations than all forms of cancer combined. It is the most frequent cause of hospitalization in people over 65. Previously, the primary treatment for heart failure was a strict drug regime. Medtronic brings new hope to many heart failure patients through its cardiac resynchronization therapy. After a cardiac resynchronization device implant, many patients experience a significant improvement in their quality of life.

Silke Tamburini had suffered from heart failure for several years before cardiac resynchronization therapy positively transformed her life. Getting out of bed, showering, riding her bike and even speaking have become again everyday activities. Today Silke can say, “It is such a wonderful feeling that now I can do all of the ordinary activities of life. It is as if nothing ever happened.”

Having suffered a myocardial infarction in his early thirties, Aziz Vally was diagnosed with severe heart failure at the age of 50. In spite of optimal drug therapy, he was not even able to complete a 6-minute walking test. In addition, he experienced episodes of ventricular tachycardia. Combining cardiac resynchronization therapy (CRT) and an implantable defibrillator (ICD) brought him back to a normal life. He now goes to the gym, drives his car and works again as a general practitioner. “I feel physically and mentally better, my life is 100 times better than before the implant. You cannot compare before and after: it is like chalk and cheese.”

“My life is 100 times better than before the implant.”
Sudden Cardiac Arrest

Sudden cardiac arrest can happen to anyone, anytime – a complete loss of heart muscle coordination in which little or no blood is pumped to the body. It is estimated that up to 400,000 people in Europe die from sudden cardiac arrest each year.

To be successful, defibrillation treatment - an electrical shock to restore normal heart rhythm – is required within the first few minutes. It generally takes six to 12 minutes for the average emergency medical services team to arrive at the scene of a medical emergency. For every minute that goes by without receiving a defibrillation shock, survival rates decrease by about 10 percent.

The Medtronic automated external defibrillators (AEDs) deliver that immediacy. They are compact, portable, and easy to learn and use.

In 1998, Robert Oster, then 15 years old, fell down in the schoolyard. A Medtronic AED was used to interrupt the possibly fatal heart fibrillation and bring the heartbeat back to a normal rhythm.

Robert says: “I was so lucky to benefit from immediate resuscitation. Without the help of the AED, I would not be here today. And now I have an implantable cardioverter defibrillator, so I feel secure all the time.”

Heart Valve Disease

Every year in Western Europe, one in every thousand people will undergo cardiac surgery. This may be a coronary bypass, valve replacement, heart transplant or complex heart repair in young children. Cardiac surgeries have a proven ability to restore full life, alleviate pain, and extend the life of patients.

António Camões Sobral was eight years old when his acute polyarticular rheumatism was discovered. Later he developed a rheumatic valvulopathy, with a severe valve lesion indicating a poor prognosis.

Impelled by a strong will to comprehend why he was different from other children, António studied medicine and became a cardiologist. He was 43 when he received the news that his mitral valve had no chance of being repaired. As a cardiologist, he was glad to know that a Medtronic valve was to be implanted in his heart. More than a decade after surgery, António can say, “My life after surgery changed dramatically. Thanks to this valve I’m still alive. Once again, I can look into the future.”
Vascular Disease

Vascular disease affects millions of people. The costs - both in human suffering and medical care - are enormous. Medtronic offers innovative solutions to many patients suffering from coronary artery disease, which affects the vessels that supply oxygen to the heart; peripheral vascular disease, which refers to plaque build up in arteries and abdominal and thoracic aortic aneurysms, which occur when the aortic wall becomes weakened by plaque build up, “ballooning” to form an aneurysm.

During a career in the army and afterwards in an industrial cleaning company, Martin Greaney had led a reasonably sedentary lifestyle. He enjoyed ‘the good things in life’. However, on a shopping trip Martin suffered intense chest pain. Within one hour, he was rushed to the hospital and a rescue angioplasty was performed following a heart attack, indicating coronary artery disease. A Medtronic coronary stent was successfully implanted. Martin is still getting used to his new lifestyle where a healthy diet and regular exercise play a major role. He plans to undergo some further education so that he can return to work and says, “I feel like I have won the lottery! I have a second chance, I’m still alive.”

Martin Greaney, Ireland

“With the implantable sacral nerve stimulation system, I became a normal woman again.”

Bladder Control

Bladder control problems have a major impact upon people’s day-to-day personal and working lives. In Western Europe alone, nearly 30 million people suffer from an underactive or overactive bladder. Medtronic’s implantable sacral nerve stimulation system influences the urinary function by applying mild electrical stimulation to the sacral nerves. These are the nerves which affect the bladder, bowel and pelvic organs.

After a urinary infection, the urinary retention for Paola Parmeggiani became increasingly inhibiting to her lifestyle and well being as an active, working mother. Autocatheterization – using a catheter to empty the bladder at regular intervals - was not a solution for a woman ‘on the move’. Now Paola says, “With the implantable sacral nerve stimulation system, I became a normal woman again.” No more catheters in Paola’s handbag.

Paola Parmeggiani, Italy
Parkinson’s is a long-term disease, as Catherine Tailliandier will testify. Well over twenty years ago, she raised her left arm and saw it shaking - immediately recognizing a symptom of Parkinson’s disease. Medtronic’s brain stimulation therapy has been a breakthrough for Catherine and she is meeting the challenges of the disease, saying, “There is no comparison to what I lived before the surgery. I do not consider myself anymore as ill.”

It took a neurologist to discover Anita van der Wal had slipped a disc in her neck after an accident some years earlier. Neither physiotherapy nor wearing a collar conquered the neck and arm pain, making it impossible for her to continue her job as a taxi driver. After a disc replacement, Anita says, “My pain has gone and I’m back to doing nearly everything I did before the accident, including driving.”

Both injury and degenerative disc disease associated with ageing can cause spinal disorders. Cervical spinal disorders - when discs in the neck region begin to wear out or are injured - are debilitating for sufferers. Medtronic’s pioneering cervical disc system is a prosthesis that can replace and mimic the flexibility and shock-absorbing characteristics of natural intervertebral discs.

When you think of Parkinson’s disease, the first thing that may come to mind is the uncontrolled shaking. But other symptoms can be much worse. Extreme swings in movement control - can occur in the span of a few hours. Routine daily activities such as bathing, dressing or eating may become difficult or impossible without assistance from others. The average age at onset is 60, but ‘young onset’ may occur as early as 20. Patients often describe themselves as prisoners within their own bodies. The Medtronic Parkinson’s control therapy offers new hope. An implantable device delivers electrical stimulation to precisely targeted areas deep in the brain. The stimulation is adjustable, and its effects are reversible.
Chronic pain affects over 70 million people in Western Europe. It can be caused by a variety of injuries and diseases, including nerve damage and cancer, and most commonly affects the lower back and legs. Left untreated or under-treated, chronic pain can destroy a person’s life. Beyond the physical disability that often results, it can lead to difficulty holding a job, low self-esteem, strained relationships and depression. But many patients can be treated effectively and safely with Medtronic neuromodulation therapies.

Another type of pain which can be treated with neurostimulation is severe angina pectoris. Angina pectoris is a vice-like, suffocating or crushing chest pain associated with transient ischemia (lack of blood flow) of the heart caused by atherosclerotic coronary disease. An increasing number of patients with coronary artery disease have symptoms that are unresponsive to both conventional medical therapy and revascularization techniques. Such patients are said to have refractory angina pectoris.

With spinal cord stimulation, it is possible to effectively manage the angina pectoris symptoms, as well as to improve patients’ exercise capacity and quality of life.

In 1995, Patrick Looney suffered two heart attacks, and developed debilitating angina. He was in constant pain, typically spending two or three days a week in bed and was admitted to hospital 23 times in the next three years. Unsuitable for further surgery and with his pain not controlled by drug therapy, Patrick was referred to a specialized pain management service, and in 1999 he received a spinal cord stimulator.

Today Patrick says, “I’m back at work on the building site, I visit the gym, take well earned holidays and I’m away from hospital – grateful for the device that, every day, helps me take control of my life again.”

Spasticity

Spasticity is a condition that causes stiff, tight muscles, especially in the arms and legs, making movements jerky or uncontrollable. Everyday activities like walking, eating, dressing or bathing can become time consuming and difficult for individuals with spasticity, as well as for their caregivers.

Depending upon the severity of the spasticity, individuals and their health care professionals can design a treatment program consisting of one or more of the following: physical and occupational therapy, oral medications, injections into spastic muscles, drug administered by an implantable drug infusion system, orthopedic surgery and neurosurgery.

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Pain

Defined as pain that persists or recurs for more than six months, chronic pain affects over 70 million people in Western Europe. It can be caused by a variety of injuries and diseases, including nerve damage and cancer, and most commonly affects the lower back and legs. Left untreated or under-treated, chronic pain can destroy a person’s life. Beyond the physical disability that often results, it can lead to difficulty holding a job, low self-esteem, strained relationships and depression. But many patients can be treated effectively and safely with Medtronic neuromodulation therapies.

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Mårten’s arms are now on the move as he investigates his surroundings – it has brought even more of a sparkle to his mood.”

Mårten Ingner, Sweden

Born one month early, diagnosed with cerebral palsy at six months and shortly after with tetra palsy - paralysis in both his arms and his legs - Mårten’s challenges could not have been underestimated. Now Mårten benefits from the implantable drug infusion system. According to his father, “Mårten’s arms are now on the move as he investigates his surroundings – it has brought even more of a sparkle to his mood.”

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Patrick Looney, UK

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Diabetes

You might know someone with diabetes. But maybe you don’t know how difficult it can be to manage the disease. Eat this don’t eat that. Check blood sugar levels. Inject the right amount of insulin, and on and on. Forget about the freedom to live a normal life.

Diabetes is the body’s inability to produce or properly use insulin. It can be devastating. Complications can lead to heart disease, blindness, kidney failure, amputation, and in many cases death. More than 150 million people around the world have diabetes, and that number is expected to soar to 300 million by 2025. In Western Europe alone, there are about 18 million diabetes patients.

The key to preventing diabetes complications is keeping blood sugar levels within a normal range. For many patients, insulin delivery with an insulin pump is the most effective way to maintain this type of control. That’s because a pump mimics a healthy pancreas and more accurately meets a patient’s insulin needs by allowing them to easily adjust their insulin dosage when they, for example, want a slice of pizza or a piece of cake.

Diagnosed with diabetes at the age of 18, Jane Bigler had to take insulin injections to survive: “Whenever I was invited to someone’s place or to a restaurant for dinner, I had to ask for a bathroom, and then go there to make my insulin injection. But now with my insulin pump, I have much more freedom, making me feel safe, comfortable and flexible in the small details of my everyday life. Indeed, with the insulin pump, I can manage my disease instead of the disease managing me.”

Jane Bigler, Switzerland

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Mission

• To contribute to human welfare by application of biomedical engineering in the research, design, manufacture, and sale of instruments or appliances that alleviate pain, restore health, and extend life.

Alleviate pain

• To direct our growth in the areas of biomedical engineering where we display maximum strength and ability; to gather people and facilities that tend to augment these areas; to continuously build on these areas through education and knowledge assimilation; to avoid participation in areas where we cannot make unique and worthy contributions.

Restore health

• To strive without reserve for the greatest possible reliability and quality in our products; to be the unsurpassed standard of comparison and to be recognized as a company of dedication, honesty, integrity, and service.

Extend life

• To make a fair profit on current operations to meet our obligations, sustain our growth, and reach our goals.

• To recognize the personal worth of employees by providing an employment framework that allows personal satisfaction in work accomplished, security, advancement opportunity, and means to share in the company's success.

• To maintain good citizenship as a company.
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