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Medical technology in **Hungary**:
Incubation, innovation and manufacturing precision

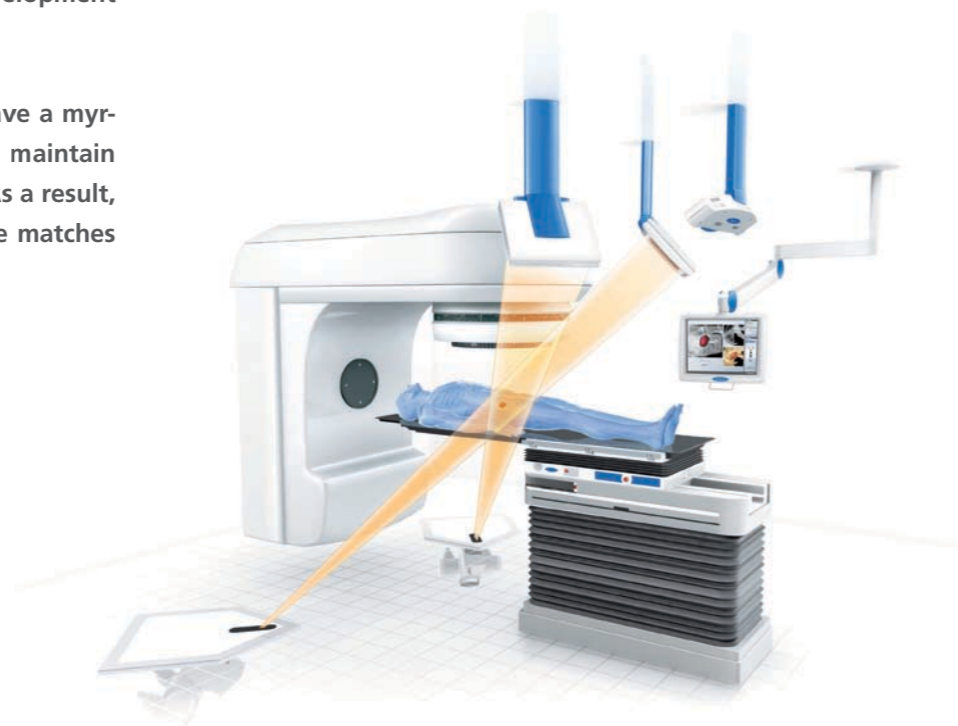


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Rich traditions in medical technology

Hungary excels in the development of hospital and medical technology, a sector that has seen almost a century of groundbreaking innovation, highly specialised technical development and significant exports to all five continents.

Companies involved in research and development have a myriad of links to local universities and institutions and maintain close contact with Hungarian health care providers. As a result, there are many areas in which Hungarian health care matches or even surpasses the European Union average.



1. BUILDING ON THE PAST

The beginnings of medical equipment technology development in Hungary date back to the early 20th century.

The early 20th century:

- Industrial-scale manufacture and distribution of X-ray machines began on February 23, 1918, when Odelga Gyógytechnikai Rt. was officially registered at the Royal Court in Budapest. Since February 1933, the company has been known as Magyar Siemens-Reiniger Művek Rt.
- In 1929, Philips of Eindhoven, Holland, established a trading company called Metalix Rt. in Budapest, before later building an X-ray factory by the name of Vatea. In the same year, Károly Hatscher founded a small workshop in Budapest.
- In the 1920s and 30s, a host of manufacturers produced X-ray devices, including an engineer at the Ganz electrical factory named Géza Varga, Martin and Sigray, Erdélyi és Szabó Rt., Bartha and Székely, and Elektromos Transzformátor és Készülék Rt.

The mid 20th century:

- Development and manufacturing by small and mid-sized enterprises – to use today's terminology – in other fields of medical technology continued until Soviet occupation in 1945, or rather the beginning of the Communist dictatorship in 1948-49, when small companies were nationalised and consolidated. Magyar Siemens-Reiniger Művek Rt.

became the sole company on the Hungarian market in 1933, operating as Medicor Művek from 1963 onwards. (See separate section on the history of Medicor.)

- In the 1960s, semi-conductor technology and microprocessors made it possible to manufacture larger and more complex systems. Elektronikus Mérőkészülékek Gyára (EMG) and Gamma Művek (Gamma) were pioneers in this field. EMG specialised in ECG and EEG technology, while Gamma developed a range of nuclear medical systems. Another company, the Medical Aids Factory played a major role in aiding rehabilitation by mass producing a variety of equipment to assist those suffering from a variety of disabilities.

The late 20th century:

- Since the fall of Communism, the market for medical technology has experienced significant changes. New ownership and manufacturing structures have evolved and stabilised as large domestic companies have gradually been privatised and split up.
- After the regime change, some 100 small and mid-sized companies were formed in the wake of the regime change. Many of these continue to further the strong traditions in this field and the majority remain in Hungarian ownership.

Medicor Művek

Medicor Művek was formed from Hungary's medical technology companies in 1963. This company, tasked with development, manufacturing and trading, played a dominant role in the domestic industry for some 30 years.

Medicor Művek continued to expand and develop into the 1980s. At its peak, the company employed more than 10,000 people in its two factories, research and development institute, and domestic and export trading arms. In this period, Medicor accounted for more than half of Hungarian medical technology manufacturing and had representation in 35 countries around the world. Some 85% to 90 % of production was exported, predominantly to the Comecon countries.

- The company manufactured 450 types of equipment and 1,500 medical instruments. Its product range spanned the full medical spectrum from single-use syringes through electro-medical equipment and X-ray systems to complex subsystems and complete health care solutions.
- The changes of the 1980s did not pass Medicor by. The company split into ten independent manufacturers and service providers and in February 1989, Medicor's largest creditors and several banks founded Medicor Holding. In 1993, the company was acquired by Postabank, but when the financial institution collapsed in 1998, it came under direct state control once more.
- Further significant changes followed when Medicor Röntgen Rt. was sold to America's General Electric, while two thirds of the remain-

ing shares were acquired by the Hungarian Equity Partners (HEP), overseen by the European Bank of Reconstruction and Development (EBRD), with the final third purchased by the Hungarian-American Enterprise Scholarship Fund.

- The Medicor management reacquired Medicor Röntgen Zrt. from GE in 2003, while the EBRD and Hungarian-American Enterprise Scholarship Fund sold its share, largely to the company's directors in 2003-2004.

Today, the manufacturing and service companies in the Medicor Group are almost entirely Hungarian-owned and serve as the headquarters for Hungarian production of medical instruments and related services. These companies include Medicor Elektronika Zrt., Medicor Kéziműszer Zrt., Medicor Szerviz Zrt., Dispomedicor Zrt. and Medicor Meditű Kft.

Manufacturing facilities and technologies

The Hungarian medical technology industry has a wide variety of manufacturing technologies and facilities at its disposal:

- Several companies deploy modern manufacturing technologies allowing them to manufacture products of international quality.
- Meanwhile, the instrument manufacturing sector of the medical technology industry tends to run small or medium-sized batches of custom products.
 - This allows them to forego costly modern equipment in favour of

focusing on manufacturing individual components on a contract basis. The end-contractors are usually domestic companies but manufacturing of smaller volumes of lightweight components may also be outsourced abroad.

Expertise and technology adoption

Specialists already employed in medical technology before the political changes have now been joined by a new generation with more than a decade's experience of modern technology and precision manufacturing processes. In recent years, the number of young people studying modern technologies at technical universities has shown strong growth, laying the foundations for rapid adoption of the latest medical technologies and research results.

Economic success

- Estimates show that Hungarian medical technology companies generate annual revenues of Ft 150 billion (€550 million) from the manufacture and sale of medical and hospital equipment.
- Total turnover of Hungarian medical manufacturers is estimated at around Ft 10 billion, with the major companies forming the MediCluster generating sales exceeding Ft 7 billion in 2007, of which more than 3% came from exports.
- The average growth rate of Hungarian companies has reached double figures over the past five years even despite unfavourable development of the HUF/USD exchange rate.

• The number of people employed in the industry in 2007 was 7,107 with productivity (gross added value per person) matching the international average at more than HUF 4.2 million. Production of medical instruments and equipment contributed 0.16% of gross domestic product in 2007.

• The current annual export volume generated by Hungarian-owned companies in instrument manufacturing is estimated at more than Ft 15 billion, with multinational companies accounting for a considerably larger sum.

• The breakdown of sales channels and regions is a closely guarded industry secret, but a press release issued by Medicor Elektronika Rt. reports that the company has maintained some of its market share in the former Soviet Bloc and intends to pass on these opportunities to other members of the MediCluster.

Foreign or foreign-owned companies

Since the early 1990s, multinational companies have been attracted to Hungary by the large number of highly qualified specialists and now perform some of their most knowledge-intensive tasks here. Included among them is General Electric Zrt., engaged in the development of X-ray technology, digital imaging and digital mammography equipment, and Hans Pausch Hungária Kft., which specialises in the development and production of X-ray equipment.

You can find a list of foreign-owned manufacturers and distributors on pages 18–22.

Medicor Elektronika Zrt.

- Medicor Elektronika has registered capital of €500,000 and posts annual revenue of between €2 and €3 million. It is 100% in Hungarian private ownership.
- Medicor Elektronikai Zrt. was part of the state-owned Medicor Művek, founded more than half a century ago, and is the legal successor to its subsidiary Medicor Medakku, founded in early 1983, and Medicor Diagnosztika Kft. The company has operated as a stock company since January 1, 1989.
- The company is overseen by the Medicor® Group, one of the major developers and manufacturers of medical instruments in the European Union.
- The stock company plays a key role in the design and production of neonatal medical equipment for which it has a global distribution network. Its home treatment products also generate considerable revenue, particularly in Hungary.
- Medicor Elektronika's leading products include hospital equipment (clinical neonatal incubators, reanimation and heated tables, blue light lamps, infusion pumps and accessories for neonatal medical care) and home diagnosis and therapy products (baby scales, apnea alarms, digital blood pressure monitors, TENS devices, blood sugar monitors, digital thermometers and massage products).
- The company also distributes several hundred branded products from other vendors and operates an online store.

- The quality of Medicor Elektronika's work and products is guaranteed by ongoing development, reliable production processes and strict quality control. It works with a broad network of approved domestic and international suppliers.
- Medicor Elektronika has outstanding references for its own products and those it resells. Its equipment is present in all of Hungary's hospitals and large quantities are exported to markets in the CIS, particularly Russia, Ukraine and Belarus, as well as Poland, Germany, Italy, Romania, France, Austria, Slovakia and Belgium. Many of its products are also sold in South America (Brazil and Peru), the Middle East (Egypt, Syria and Iran), and Africa (Libya and Algeria). The company has also established strong links to the Chinese and Indian markets.
- Medicor Elektronika Zrt. is a founder and leading member of the Professional Association of Hungarian Medical Manufacturers and Suppliers.

Medicor Kéziműszer Rt.

- For half a century, Medicor Kéziműszer has been the leading manufacturer and distributor of medical instruments in Hungary and played an influential role in Eastern Europe.

Its core competency is the manufacture of almost 6,000 stainless steel surgical and dental instruments. Its products include knives, scalpels, scissors, tweezers, vascular clamps, tampon and tissue forceps, pin-cers, hooks, spreaders and laryngoscopes, bone forceps, clamps and

elevators, atraumatic instruments, microsurgery instruments, sampling spatulas and tweezers, dental pliers, root elevators, cavity filling devices, periodontal, orthodontic and oral surgery instruments.

- The high quality of Medicor Kéziműszer medical instruments is ensured by materials sourced from Germany, modern production process and a team of 500 experts with enormous professional expertise. The company's annual manufacturing volume totals 1.5 million instruments, of which 90% is exported to Western Europe, the US and Japan.

Innomed Medical Zrt.

- Innomed Medical is primarily engaged in research, development, manufacturing and sales in the fields of cardiology, intensive therapy, defibrillator technology and digital radiology. It exports to more than 100 countries of the world.
- The company won an Innovation Grand Prix in 1999 for its range of high-frequency X-ray generators.
- The foundations for Innomed Medical Development and Manufacturing were laid with the formation of Innomed Kft. in 1989. This was followed by consolidation with other companies in the group in 1999 to create a stock company with considerably larger working capital.

The company employs almost 200 people in its Budapest headquarters and Esztergom factory. A key factor in its operations is the use of the latest and most efficient production technologies and management methodologies to ensure the requirements of both doctors and management are met.





- In 2002, the company purchased an exclusive licence to manufacture and distribute the complete range of products from Danish defibrillator manufacturer and developer Artema, including its automated assembly lines. The CardioAid 200B biphasic defibrillator was built on this technology, but further innovation from in-house developers has made it among the most popular products.

- A partnership agreement has also been signed with CardiacScience of the United States for the exclusive distribution to Central and Eastern Europe of one of the world's most advanced semi-automatic biphasic defibrillators.

- In addition to Innomed Medical's cardiography range, its radiology products have also experienced rapid development since its propriety high-frequency X-ray generators first appeared on the market in 1994. The company has continued to keep pace with the latest developments in radiology, regularly developing and updating its product range to satisfy the changing demands of the medical profession. The digital pulmonary function testing cabins and their mobile adaptations suitable for installation in vehicles developed by Innomed Medical engineers have achieved success both domestically and internationally, generating a higher share of the company revenues year by year.

- The company has also deployed cutting-edge technology to stake a claim on the market for PACS systems and gathered a wealth of experience in the installation of complete scanning and imaging systems.

- Its cardiographic instruments can be adapted to the specific needs of various medical disciplines, resulting in considerable commercial success in more than 100 countries. Innomed products include ECG equipment from the basic to the professional, as well as Holter monitors and stress testing systems.

The most dynamic of Innomed Medical's intensive therapy products is its bedside and transport monitoring system comprising portable colour monitors and centralised control centres.

77 Elektronika Kft.

- 77 Elektronika was established in Budapest in 1986, quickly growing into an efficient and recognised private enterprise. The company's philosophy of continuous innovation and development is the secret to its steady growth.

- In the field of medical technology, 77 Elektronika manufactures reflexive photometres and their reagents for measuring blood sugar and urinalysis at home and in the laboratory. The company plays a leading role in Hungary's market for blood sugar monitors and has also developed testing devices for the international market.

- Its propriety urinalysis equipment ranges from the world's smallest pocket devices to semi-automatic laboratory equipment for sediment analysis. 77 Elektronika products have been independently distributed in many countries around the world since 1999.

- One of the key strengths of 77 Elektronika Kft. is its dynamic team of young researchers and developers. The company currently employs 240 people, among them 45 engineers focused on the improving production processes. Their dedication, flexibility and ability to adapt changing market demands runs through every aspect of the company and results in cost-effective technical solutions and development-driven production processes. In addition, an in-house graphics and creative team is responsible for product design and branding, helping the company steadily increase its market share.



Piston Kft.

- Piston specialises in the calibration of devices to monitor breathing, known as spirometres. Although this is a relatively small segment of the market, the company's outstanding team of engineers provides a world-class range of services.
- Piston Kft. was founded in 1990 and its core competency lies in the development and production of medical systems and technologies, particularly audiometric and pulmonary function testing devices.



- In 1987, the company's engineers were among the first in the world to develop a spirometre based on the IBM PC. This has allowed the company to stay several steps ahead of the competition even to this day.
- Of the two companies in the group, the Hungarian-based operation specialises in hardware and software development, production and logistics, while the team in Montrael, Canada, is engaged in systems development, integration and localisation.
- Piston Kft.'s domestic market share for pulmonary function testing devices is currently at least 75%.
- While importers and traders have come and gone down the years, one of the major factors in Piston's success has been its ability to serve the domestic health care market from more than 15 years.



- More than 900 references in the fields of hearing and pulmonary function testing.
- Piston products are exported to all the five continents of the world via a comprehensive distribution network.

2. ORGANISATIONAL STRUCTURES WITHIN THE SECTOR

Association of Medical Technology Suppliers

- The Association of Medical Device Manufactures and Suppliers (OSZ) was formed in 1997 and has been a member of Eucomed (the European Medical Technology Industry Association) since March 1998.
- The members of OSZ list Hungary's top 50 manufacturers and suppliers of medical technology, including Hungarian and international organisations generating turnover in the billions of forints, as well as a large number of small and mid-sized enterprises serving the entire country.
- Their products and associated services cover the full spectrum of medical equipment, from conventional devices to state-of-the-art technology and solutions for every discipline.

The Medical Technology Institute

The rapid development of medical technology in recent decades has resulted in specialist institutes springing up all over Europe.

- The National Hospital and Medical Technology Institute (ORKI) is a non-profit organisation established in August 1962 to guarantee the quality of manufactured products employed in the health industry.

Since its foundation, ORKI and its successor have been overseen directly by the Hungarian Ministry of Health.

- From day one, ORKI has been tasked with testing and assessing medical devices and participating in the process of establishing industry norms and standards.
- ORKI issues certification on the basis of both domestic and international standards and regulations. It also operates a database to keep an inventory of the country's equipment and devices. This information is also used for accident prevention purposes nationwide.
- From fielding questions related to hospital technology to providing a forum and education platform for medical experts, ORKI provides a wide range of specialist services to support the domestic health care sector. It also has contractual relationships with similar organisations in other countries and its employees actively participate in the work of international bodies, such as CEN, CENELEC, IEC, IF-MBE, IFMBE-CED, IMDG, ISO, NB-MED and WHO.
- From 2000 onwards, the organisation was known as the Medical and Hospital Technology Institute, before being renamed the Institute for Healthcare Quality Improvement and Hospital Engineering (EMKI) in March 2008. This body's main responsibility is to

combine the various tasks and methodologies related to specialist health care across the various disciplines of the sector. This extends to developing a broad network of scientific and professional contacts in the field of quality development across the member states of the EU.

Financing of treatment technologies

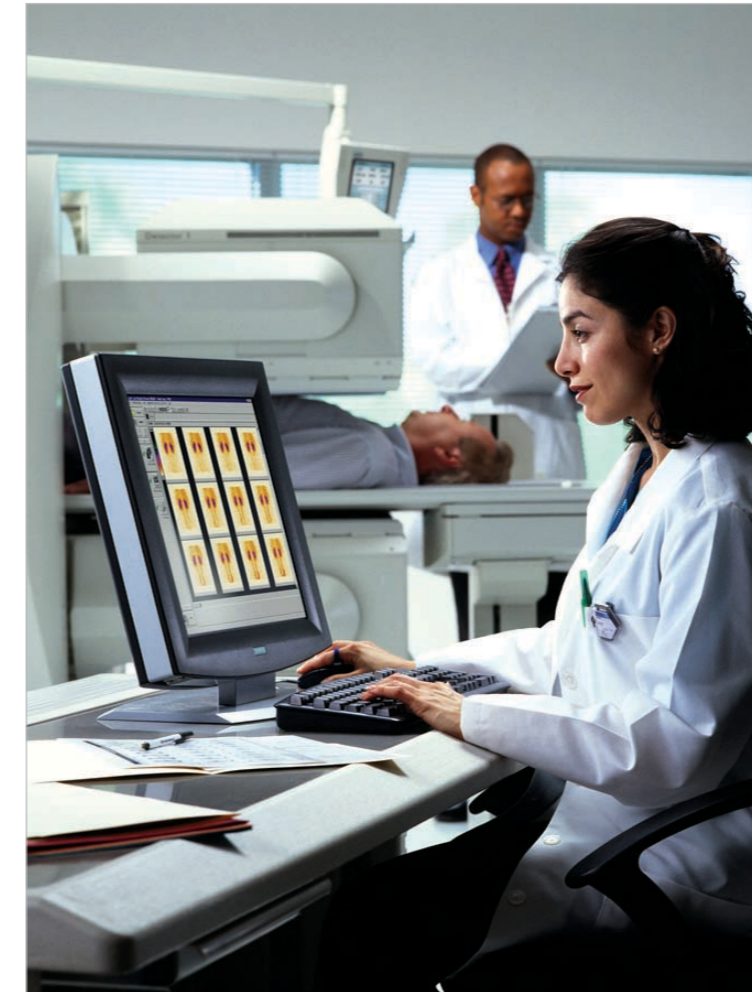
- The health care industry in Hungary, including medical and hospital technology and treatment aids, are largely financed through the country's social security system and federal budget. As a result, government financing accounts for the lion's share of health care spending.
- The treatment-prevention fund dedicated to financing the system contributes some 60% of total health spending, with inpatient treatment taking the largest share of Hungarian government funding.
- In recent years, the rapid development of health care technology and the period of inflation following the political changes has led to major increases in both the number and cost of medical devices available. The corresponding growth in health care spending has been funded by the National Health Fund budget.
 - In 1992, social security support for treatment aids was Ft 4 billion, a figure that has now increased to Ft 50 billion.
 - The number of products patients are entitled to use also continues to grow. In 2000, less than 3,000 products were subsidised, by 2007, there were 7,521 medical aids available with government support. (See table below for a breakdown of Health Care Fund costs.)

Breakdown of Health Care Fund costs in Ft millions (2004-2009)

Description	2004	2005	2006	2007	2008	2009*
Treatment-prevention	654,622	694,452	713,954	718,717	757,214	719,033
Medical aid subsidies	42,983	44,132	48,527	36,626	41,877	49,780
Of which dressings, bandages	4,197	5,048	6,568	3,612	5,134	7,323
Subsidised rental of medical aids	–	–	138	69	88	100
Other subsidies for medical aids	38,785	39,084	41,821	32,945	36,655	42,357

* This publication was printed before the end of the year, figures for 2009 are estimates

- Private health funds are playing an increasingly significant role in health care financing. The 40 or so health funds currently in operation contribute to around a quarter of spending on medical aids.
 - These health funds now have some million members and total capital approaching Ft 50 billion.
- The proportion of public and private spending remained stable for the period between 2003 and 2005, with 70% coming from the government and 30% from private financing. In this period, public spending grew by 16%, while private outgoings increased by 22%.
 - Of total private health care funding, 42% was spent on medication and medical aids.



Demographic indicators

- In 2006, life expectancy at birth in Hungary was calculated at 69 years for men and 77 years for women, the best figures ever recorded.
- Men can now expect to live 4.5 years longer than in 1993, while women have 3.5 more years to look forward to.
- More than 35% of the population has been suffering from some form of long-term health problem for more than seven months and 13% have a health issue that significantly restricts their daily activities.

Health care service data

There are more than 27,000 health care providers operating in a variety of forms in Hungary. They offer services on three levels: primary care, outpatient treatment and specialist inpatient care.

- The network of general practitioners and local paediatricians providing primary care has not changed significantly over the past seven years. By late 2006, there were more than 5,000 GPs and 1,600 local paediatricians practising in the country.
- Outpatient care is provided in specialist clinics and a variety of national institutions.
- Specialist treatment of inpatients takes place in hospitals, clinics and national health institutions.

- By late 2007, there were a total of 72,000 available beds in 180 hospitals, translating into 71.6 beds per 10,000 population.
- Local governments hold the largest share of ownership with 112 hospitals, 62% of the total, representing two-thirds of all beds.

The state of medical and hospital technology

The overwhelming majority of reviews of health care infrastructure in Hungary highlight the poor state of the system – run-down infrastructure, obsolete technology and high amortisation rates – and a lack of capacity to provide adequate treatment.

- The total inventory of health care equipment in Hungary was valued at Ft 52 billion in 2007.
- This was 16.7% short of 2006 levels and a nominal reduction of 11.6% over 2005.
- This reflects the fact that acquisition of new equipment was insufficient to compensate for the loss in value of existing inventory and equipment written off entirely.
- The percentage of items written off was found to have grown from 61% to 67%. The situation with respect to high-value equipment, such as MRI and CT scanners is equally troubling; Hungary is ranked in second last place in international comparisons.
- The situation is clouded somewhat by the fact that institutions frequently use equipment owned by third parties. These are leased and

rented, provided at no cost on signature of a supply contract for related products (such as reagents), or owned by non-profit organisations.

- Despite the improvement in quantity of medical devices, their average age has continued to grow in much the same way as that of hospital equipment (see table).
- At the same time, it is important to note that considerable European Union funds have been made available for health care development in the 2007-2013 EU budgetary period. This will cover replacement of large quantities of obsolete equipment.

Average age in years of medical devices and hospital equipment (2002-2008)

Year	2002	2003	2004	2005	2006	2007	2008
Medical devices	10.7	11.29	11.24	11.65	11.65	11.86	11.74
Hospital equipment	9.47	10.6	10.62	11.32	11.47	12.17	11.32



Bank financing

In addition to owners and maintainers, banks also offer credit constructions to help health care institutions replace obsolete systems and equipment.

- The CIB Leasing Group has financed leasing of medical technology for more than six years and established excellent ties with distributors of medical devices and hospital equipment. This makes it possible for service providers to lease equipment for primary and specialist care, as well as devices used in the private sector.
- MBK Bank offers a similar service in conjunction with Deutsche Leasing Hungaria for conventional investment loans, equipment leasing and rental, as well as loans for individual purchases. The bank also supports the development of medical technology by providing start-up loans for projects eligible for government grants.

Hungarian government support for innovation and investment

- The Hungarian government – making use of the New Hungary Development Plan – is initiating a series of programmes for focused development of technical innovation capacity in industries considered key economic drivers, such as medical equipment.
 - creating the necessary intellectual, infrastructural and economic environment
 - promoting and attracting knowledge- and technology-based enterprises

- financial support is offered for technology incubators and the development of technology platforms, innovation networks and clusters in key knowledge centres.
- The Hungarian government also provides additional incentives to encourage foreign investment in this and other key technology sectors.
- The National Development Plan lists health care infrastructure – and development of medical technologies involving rehabilitation, modern treatment and physiotherapy in particular – among its top priorities.

General economic background

- Hungary has made considerable progress since 1997 in its efforts to achieve economic parity with the EU, both in terms of GDP per capita and employee productivity. Foreign direct investments and exports have played a key role in this success as the vast majority of Business Enterprise Research and Development (BERD) has been driven by foreign-owned organisations.
- Many Hungarian businesses have gained important manufacturing, financial and commercial insight from their international peers, and the arrival of foreign capital has therefore had an indirect benefit on Hungarian economic performance.
- Due to its small size and openness, export activity will always play a key role in the growth of the Hungarian economy. Exports have increased by an annual average of 17% since 1997 with plant and machinery showing the strongest growth of 25% per year.

- Two sectors, electrical equipment and device production and automotive manufacturing, account for half of Hungary's total exports.
- In terms of the technical quality of its exports, the Hungarian economy outperforms its rivals in Central Europe.

MediCluster

The MediCluster of Hungarian Medical Manufacturers and Service Providers was formed by members of the Association of Hungarian Medical Device Manufacturers (www.mdma.hu) in 2006.

- The MediCluster (www.mediklaszter.eu) is a network of profit-oriented and non-profit companies and institutions engaged in development, sales and services related to medical devices, or involved in import activity and associated business and technical consulting.
- The cluster operates with a flat hierarchy and in a spirit of trust and economic collaboration between its members.
- The organisations participating in the cluster include key players in the Hungarian medical technology sector. These companies are Hungarian-owned and involved in the development, production, distribution and promotion of medical technology to provide high-quality medical solutions for social benefit.
- Their mission is to deliver state-of-the-art solutions at reasonable acquisition and maintenance cost. Dominant areas of the MediCluster's work include the development, manufacture and distribution of home diagnosis and treatment products and hospital equipment.

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- In 2008, the MediCluster earned the title "Accredited Innovation Cluster". Of the nine accredited clusters in Hungary, it is the only one specialising in medical technology.

Budapest Innopolisz Programme

The City of Budapest launched the MTA Regional Research Centre in collaboration with the Hungarian Government, the Semmelweis University, the Loránd Eötvös University of Science and the Budapest University of Technology and Economics. Significant research and development organisations also joined forces to establish three competitive basis in the capital, which have been combined to create the Budapest Innopolisz Programme with the help of the Budapest Enterprise Agency (www.bvk.hu) and under the direction of Dr. Miklós Nagy.

The Budapest Innopolisz Programme is focused explicitly on promoting competitiveness and business development by building a knowledge base for the creation of an economy where incomes are high, productivity growth is strong and high-technology sectors are of increasing importance. The Budapest Innopolisz Programme focuses on innovation-driven economic development and knowledge sharing by bringing together local businesses, professional organisations, research and development centres and education institutions to produce globally competitive products and services. Its primary goal is to promote cooperation between key players in the knowledge economy to produce a larger range of innovative, market-ready products.

Budapest MediPólus Cluster

The Budapest MediPólus Cluster is Hungary's sixth largest representative association for academic institutions and businesses groups in the life sciences sector. It was officially formed in 2008 following many years of collaboration between its members.

its main objective is to act as an umbrella organisation for innovation in the region's health sector and promote innovative companies and organisations committed to social and economic development.

The founding members of the organisation are:

- Semmelweis University
- Budapest Corvinus University
- The Budapest Enterprise Agency
- The Hungarian Medical Manufacturers and Service Providers Cluster
- The Medical Biotechnology Innovation Cluster
- The Semmelweis Innovation Cluster
- The János Szentágotthai Knowledge Centre

The cluster is managed by Semmelweis Pályázati és Innovációs Központ Kft. and directed by Dr. Gábor Pörzse.

The cluster serves the following purposes:

- Collaboration: promotion of ties between academia and industry, development of networking and joint marketing opportunities based on common business benefits

- Increased competitiveness: Collaboration contributes to the increased competitiveness of cluster members, increased domestic and international market presence, and increased EU and domestic funding
- Representation: The university system and research network in Budapest is distributed across a wide variety of organisations. It is therefore essential to develop a platform capable of presenting a holistic view of the region's research, education and business potential, particularly with respect to European institutions and companies planning significant investments. In the absence of such a platform, Budapest and Central Hungary as a region will be unable to compete with other, more unified cities and regions.



The scope for collaboration between members is remarkably broad, extending from joint marketing and PR activities to coordination of collaborative business programmes.

The cluster welcomes new domestic and international members associated with the health care sector or offering complementary business development services.

Southern Transdanubia Cooperative Research Centre (DDKKK)

DDKKK comprises 18 research institutes and businesses.

- The centre is dedicated to bringing together universities and other higher education institutions, as well as non-profit research organisations and innovative businesses, to promote research and development and ensure strategic integration of knowledge and technology for social and economic benefit.
- Research is focused on lasers and their medical applications, but as the DDKKK's areas of interest are extremely diverse, the organisation is divided into six departments.
- The Pécs University of Science, with its natural sciences, technical and medical faculties, is the leading member of the consortium, while its main sponsor is the Pécs Industrial Park and 13 of its partners.
- DDKKK has a strong network of contacts around the country, including six partners in Budapest, two in Szeged and one in Szentendre, but it exercises the greatest influence in Southern Transdanubia (www.ddkkk.pte.hu).

Company name	Core products/activities	Website
Agfa Healthcare Magyarország Kft.	Diagnostic imaging (radiography, cardiography, orthopaedics, cancer screening)	www.agfa.com/hungary
B. Braun Medical Kft.	Surgical technologies, infusion and transfusion systems, needles and syringes, operating instruments	www.bbraun.hu
Biomedica Hungária Kft.	In-vitro diagnostics, life sciences research, cardiovascular division	www.biomedica.hu
Biotronik Hungária Kft.	Electrophysiological and cardiographic instruments	www.biotronik.com
Boston Scientific Magyarország	Cardiographic, gastroenterological, oncology and radiology equipment	www.bostonscientific-international.com
Coloplast A/S Hungarian office	Stomatherapy equipment, urological and incontinence products	www.hungary.coloplast.com
Cook Medical Hungary Kft.	Surgical, gynaecological, urological and endoscopic instruments	www.cookmedical.com
Covidien ECE	Surgical instruments, intensive therapy equipment, radiology systems	www.covidien.com
Danavox-H Kft.	Hearing aids	www.danavox.hu
Dräger Medical Kft.	Anaesthetic workplaces, incubators, pulseoximeters, ECG systems, ventilators, operating theatre lighting, defibrillators, medical gas management systems	www.draeger-medical.hu
GE Hungary Zrt. Medical Systems Division	Diagnostic imaging systems, surgical instruments	www.gehealthcare.com/hu
Hartmann Rico H Kft.	Dermatological products	www.hu.hartmann.info
Meditens Hungary Kft.	Hungarian representation for Omron Co. and Omron Healthcare	www.meditens.hu

Company name	Core products/activities	Website
Medtronic Hungária Kft.	Pacemakers, defibrillators, cardiac catheters, specialist instruments for heart and brain surgery, stents and surgical equipment	www.medtronic.hu
Otto Bock Hungária Kft.	Prosthetics, dressings and bandages, rehabilitation equipment	www.ottobock.hu
Sempermed Magyarország Kft.	Surgical gloves	www.sempermed.com
Starkey Laboratórium Kft.	Hearing aids	www.starkey.hu
WIP Kft.	pH metres for laboratory testing, blood-alcohol measuring devices, titration, voltammetric and electroanalysis instruments	www.wip.hu

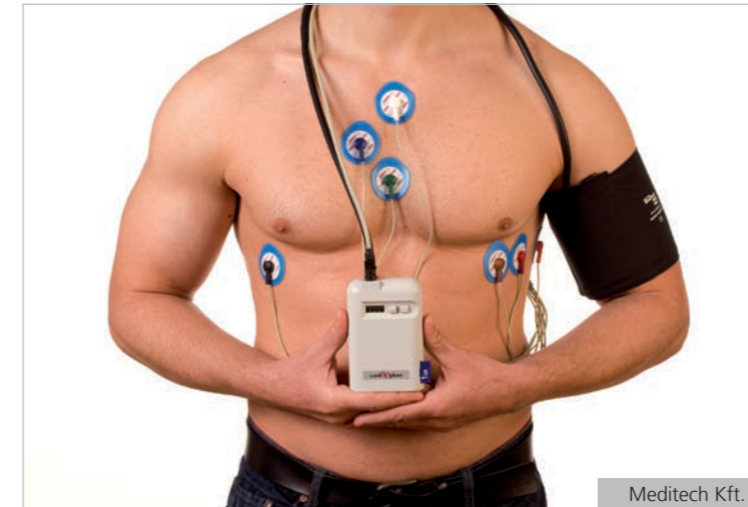
Partly or fully Hungarian-owned medical technology companies

77 Elektronika Műszeripari Kft.	Blood-sugar metres, urine analysers	www.e77.hu
Amed-Tech Kft.	Nerve and muscle stimulators, laser and electroacupuncture products	www.amedtech.hu
Askit Kft.	Development and manufacturing of impedance-based non-invasive haemodynamic monitors	www.askit.hu
ASS Magyarország Kft.	Hospital beds and equipment	www.ass.hu
Betét Kft.	Orthopaedic and diabetic shoes, insoles for flat feet	www.betet-kft.hu
BioDigit Kft.	Electronic medical products, Braille equipment	www.biodigit.hu

Company name	Core products/activities	Website
Biológiai Laborszak Kft.	Laboratory and biotechnology instruments	www.bls-ltd.com
Bionika Medline Kft.	Development and production of dental, oral, post-traumatic and orthopaedic instruments	www.bionika.hu
Control-X-Medical Kft.	Development, manufacturing and sales of mechanical components for human X-ray systems	www.cxmed.com
Cytotech Kft.	Development and sales of laboratory instruments and equipment	www.cytotech.hu
DenTech Bt.	Development and manufacturing of dental and orthodontic instruments	www.dentech.hu
Diagnosticum Rt.	Propriety development of immune diagnostics and distribution of diagnostic equipment	www.diagnosticum.hu
Diagon Kft.	Development and manufacturing of diagnostic instruments	www.diagon.com
Dia-Med Kft.	Design, manufacture and sales of treatment beds and post-traumatic rehabilitation equipment	www.dia-med.hu
Dispomedicor ZRt.	Single-use needles and syringes, infusion equipment and catheters	www.dispomedicor.hu
EMD Endoszkóp Műszer Kft.	Manufacture and servicing of endoscopic lenses and laparoscopic and open-surgery instruments	www.emd.hu
EME 2001 Kft.	Manufacture of medical laboratory equipment	www.eme2001.hu
Flexico Kft	Incontinence products, pads	www.flexico.hu
Fry Tech Kft.	Development and manufacture of urological, gynaecological and rehabilitation equipment	www.frytech.hu

Company name	Core products/activities	Website
GYSGY Reha Kft.	Manufacture and sales of custom medical equipment, prosthetics, dressings, therapy aids, personal hygiene and mobility aids, and massage equipment	www.gysgy.hu
IMED Kft.	Development and manufacture of medical IT tools	www.imed.hu
Innomed Medical Rt.	ECG, defibrillation, monitoring and radiology equipment	www.innomed.hu
Izotóp Intézet Kft.	Research, development and manufacture of radioactive isotopes and related products	www.izotop.hu
Klimex Medical Kft.	Design and implementation of medical gas systems, development of nurse call and emergency systems	www.klimexmed.hu
Kondi Bt.	Development and manufacture of ultrasound devices, hot-air sterilisers, physiotherapy systems and colon hydrotherapy equipment	www.kondi.hu
Kórház- és orvostech- nikai Szerviz Kft.	Manufacture and sales of medical instruments and equipment	www.korszev.hu
Kórháztechnikai Rt.	Manufacture and sales of X-ray and radiation protection equipment, hospital furniture, electrical and gas supply systems, and basic nurse calling systems	
Korzet Kft.	Manufacture of custom ergonomic medical aids and sports physiotherapy products	
LabTech Kft.	Development and production of PC-based ECG systems	www.labtech.hu
Lasram Lézer Kft	Development and manufacture of surgical lasers	www.lasram.hu

Company name	Core products/activities	Website
Medeco Magyarország Kft.	Wound dressings and related products	www.medeco.hu
Mediagnost Kft.	Largest distributor for Philips Medical Systems. Produces bespoke configurations and designs marketed globally in the premium price category under the Philips brand.	www.mediagnost.hu
Medi-CAD Kft.	Development and sales of Doppler ultrasound devices (vascular diagnosis and obstetrics/gynaecology)	www.medicad.hu
Medicor Elektronika Rt.	Neonatal incubators, reanimation tables	www.medelektronika.hu
Medicor Kéziműszer Zrt.	Manufacture and sale of medical instruments	www.medicor.t-online.hu
Medicor Meditű Kft.	Manufacture of surgical sewing needles	www.meditu.hu
Medicor Műtőtechnika Kft.	Manufacture and sale of operating theatre equipment and systems	www.medicor.hu
Medimon Kft.	Coordination, planning, implementation and management of complex archiving projects for radiological records	www.medimon.hu
Mediroll Kft.	Development and manufacture of audiometric and hygiene equipment, medical examination lamps and medical furniture	www.mediroll.hu
Mediszintech Kft.	Hearing aids, audiometric products, stomatherapy supplies, single-use sterile urine containers, silicon-based ear, nose and throat supplies, ultrasound and laser gels	www.mediszintech.hu



Meditech Kft.



Meditech Kft.

Company name	Core products/activities	Website
Meditech Kft.	Production of IT-based cardiovascular diagnostic systems	www.meditech.hu
MetriMed Kft	Manufacture of hip and knee prosthetics, spinal fixation instruments and implant devices	www.metrimed.hu
Microsonic Labor Kft.	Hearing aids and ocular prosthetics	www.microsonic.hu
Nagév Kötszer Kft.	Manufacture of glues and hygiene products	www.freesia.hu
Omszöv Medic Kft.	Physiotherapy and hydrobalneotherapy equipment, sterilisers, examination lamps, high-frequency surgical instruments, blood-pressure monitors	www.omszov-medic.hu
Oncotherm Kft.	Development and manufacture of oncology treatment systems based on localised thermal radiation	www.oncotherm.hu
Orel Kft.	X-ray generators, examination systems, PACS system for processing and archiving of digital images	www.orel.hu
Ortetika Kft.	Bandages, stomach and sports supports, home care products	www.ortetika.hu
Orvostechnika Kft.	Development, manufacture and sales of laboratory measuring equipment	www.orvostechnika.eu
Pikosystem Rt.	Hungary's leading company in the manufacture of bedside lighting and nurse calling systems	www.pikosystem.hu
Piston Kft.	Development, manufacture and sales of audiometric and breathing assessment equipment	www.piston.hu
Reagens Kft.	Development and manufacture of haematological reagents	www.reagenskft.hu

Company name	Core products/activities	Website
Reanal Finomvegyszer-gyár Zrt.	Manufacture of diagnostic and laboratory chemicals	www.reanal.hu
Rehab Zrt.	Manufacture and sales of walking aids, wheelchairs, mopeds, hygiene supplies, bandages, prosthetics and glues	www.rehabrt.hu
Replant Cardo Kft.	Wound dressings, incontinence and stomatherapy supplies	www.replant.hu
Rokána Kft.	Manufacture and sales of automatic breast pumps, nose cleaners and baby products	www.rokana.hu
Salus Kft.	Manufacture and sales of custom-made orthopaedic aids	www.salus.hu
Sanatmetal Kft.	Manufacture and sales of post-traumatic, orthopaedic, spinal and dental implants	www.sanatmetal.hu
Sanatmöbel Kft.	Hospital beds, furniture and stretchers	www.sanatmobel.hu
Spranz Kft.	Manufacture and sales of hernia belts, stomach supports and cotton bandages	www.spranz.hu
Technomed Kft.	Development, manufacturing and sales of surgical implants and related instruments	www.technomed.hu
TensioMed Kft.	Development and manufacture of blood pressure monitors	www.tensioemed.com
Uniclean Kft.	Development and manufacture of hospital hygiene products	www.uniclean.hu
Variomedic Kft.	Sales and servicing of heart surgery, electrophysiology and stitching products	www.variomedic.hu

Latest:

Big deals for Medicor Electronica and Thormed



In the wake of their success at the 2009 Medica trade show, Hungarian medical technology companies have signed agreements to export their neonatal incubators and portable ventilators all over the world. Medicor Elektronika Zrt. will send its neonatal incubators to China, and is planning further expansion into India and the Middle East. Deals were also signed to export Thormed Kft.'s ultrasound breathing monitoring devices to Argentina, Brazil and India, while its portable ventilators will be deployed by the US military in Afghanistan and Iraq.

Hungarians in the History of Medical Sciences

Dávid Gruby (1810-1898) Gruby's research first focused on various forms of mycosis. He published a series of articles with important findings on stomatomycosis and, later, on the anaesthetic effects of ether and chloroform. As a general practitioner Gruby soon became a popular family doctor of French artists: his patients included Dumas, Balzac, Heine, Chopin, George Sand, Liszt and Thomas. During the Paris Commune he was an ardent supporter of the revolution. Gruby was elected member of the Academy of Vienna and his publications appeared in leading medical journals.

Ignác Semmelweis (1818-1865) Semmelweis was a Hungarian physician described as the "savior of mothers". Puerperal fever (or childbed fever) was common in mid-19th-century hospitals and often fatal, with mortality at 10%–35%. Semmelweis postulated the theory of washing with "chlorinated lime solutions" in 1847 while working in Vienna General Hospital's First Obstetrical Clinic, where doctors' wards had three times the mortality of midwives' wards. He published a book of his findings in childbed fever in *Etiology, Concept and Prophylaxis of Childbed Fever*. Despite various publications of results where hand-washing reduced mortality below 1%, Semmelweis' practice only earned widespread acceptance years after his death, when Louis Pasteur confirmed the germ theory. In 1865, a nervous breakdown (or possibly Alzheimer's) landed him in an asylum, where Semmelweis died of injuries, at age 47.

Endre Hőgyes (1847-1906) His research focused on the organs of balance, particularly on the relationship between balancing and eye movements. Hőgyes made revolutionary discoveries of the complex nerve tracks of reflex functions.

Róbert Bárány (1876-1936) As a doctor in Vienna, Bárány was syringing fluid into the inner ear of a patient to relieve the patient's dizzy spells. The patient experienced vertigo and nystagmus (involuntary eye movement) when Bárány injected fluid that was too cold. In response, Bárány warmed the fluid for the patient and the patient experienced nystagmus in the opposite direction. Bárány theorized that the endolymph was sinking when it was cool and rising when it was warm, and thus the direction of flow of the endolymph was providing the proprioceptive signal to the vestibular organ. He followed up on this observation with a series of experiments on what he called the caloric reaction. The research resulting from his observations made surgical treatment of vestibular organ diseases possible. Bárány also investigated other aspects of equilibrium control, including the function of the cerebellum.

He served with the Austrian army during World War I as a civilian surgeon and was captured by the Russian Army. When his Nobel Prize was awarded in 1914, Bárány was in a Russian prisoner of war camp. He was released in 1916 following diplomatic negotiations with Russia conducted by Prince Carl of Sweden and the Red Cross. He was then able to attend the Nobel Prize awards ceremony in 1916, where he was awarded his prize.



Medical technology in **Hungary**:

Incubation, innovation and manufacturing precision

ITD Hungary - A One-Stop Shop for Business

The **government's investment and trade development agency** was established in 1993 to promote inward investments and bilateral trade. With representative offices in eight regional centres of Hungary and a foreign network operating under Hungary's diplomatic services and by special assignments in 60 countries, ITD Hungary is a **single point of contact** to support decision-makers looking for new business opportunities in Hungary.

For investors

- In-depth, **tailored information on the local economy** and the legal environment; sector-specific overviews
- Liaising with local and central authorities, suppliers and service providers
- Information and advice on **available incentives** and finalisation of incentives agreements
- Assistance in accelerating permitting procedures, recruitment and visa procedures
- Mediation between companies operating in Hungary and the government sector to **improve the business climate**
- Support and generation of reinvestments
- Promotion of Hungarian direct investments abroad

Trade promotion

Through a diverse set of marketing tools and support programmes, ITD Hungary offers substantial **logistical, financial and professional assistance** to both start-up and established Hungarian exporters. The Agency also co-ordinates the Hungarian activities of the **Enterprise Europe Network**, which, with a focus on innovative enterprises and innovation-related sectors, offers **support and advice to SMEs across Europe** and helps them make the most of opportunities in the European Union.

Communication

The Agency arranges **business programmes** for individual visitors and delegations, and organises awareness and networking business events. ITD Hungary develops and distributes **printed and electronic business literature** in a variety of languages. Subscribe to ITD Hungary's electronic weekly Newsletter and/or order a free copy of HINT, its quarterly business magazine published in English and German, at editor@itd.hu.

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