NEW YORK STATE'S TECHNOLOGY-DRIVEN INDUSTRIES:

MEDICAL TECHNOLOGY

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INTRODUCTION

Executive Summary

With about $190 billion in annual sales (about $105 billion in the US), the worldwide medical technology industry develops, manufactures and distributes a wide range of products used to improve patient health. The industry comprises two main sectors: medical technology products - the industry's most profitable sector, typically targeting small patient populations with high-technology products that carry significant risk of product obsolescence; and the conventional hospital supply sector – which comprises largely commodity-type products. Hundreds of small and midsize specialty medical technology companies operate in the US and throughout the world. US medical technology manufacturers garner nearly half of their revenues in international markets (primarily in Europe and Japan), where their technological leadership allows for dominant market share positions in most of the leading-edge product areas.

Demographic trends, both in the US and in many international markets, are expected to continue to contribute significantly to industry growth over the next few decades. And although more people are expected to live longer, unfortunately they may not be free from health problems. According to the World Health Organization (WHO), the incidence of cancer, heart disease, and other chronic diseases is expected to increase in the years ahead.

R&D spending varies significantly among medical technology manufacturers. Companies that primarily manufacture conventional hospital supply items usually make minimal R&D investments, while those that develop cutting-edge, high-tech devices typically maintain the highest R&D levels. The investment in R&D by the medical technology industry more than doubled during the 1990s and now stands at almost 13% of sales, more than 4 times the average for manufacturers overall. Nearly all of this research is privately funded. Venture capital firms remain an important funding source for start-up medical technology companies, though the share of total venture capital going to this industry has declined significantly.

The medical technology industries are part of New York State's larger biomedical cluster. (Please see page 10 which lists the industries that Empire State Development defines as medical technology). Overall New York State employment in 2001 (latest available data) at medical technology firms was just over 13,500. The State's employment in medical technology is about 5% of the national employment in the cluster. New York medical technology employees worked at more than 250 firms across the State, for average firm employment of just over 50.

ESD obtained data on employment at medical technology companies from the US Department of Labor's unemployment insurance database (ES-202 series). The data shows that nearly 60% of New York State's employees (just under 8,000) in the medical technology industry work on Long Island, in the Capital region, in the Finger Lakes region, and in Western New York. Another 32% of New York State's total medical technology employment is located in the Mid-Hudson, Central New York, and Mohawk Valley regions.

Comparing the concentrations of medical technology firms in New York with national data, four regions show greater concentration ("location quotients") than the nation as a whole. The regions showing specialization are:[1]

- Mohawk Valley (LQ = 3.6);
- Central New York (LQ = 2.1);
- Capital Region (LQ = 2.2); and
- Finger Lakes (LQ = 1.6)
- Western New York (L. Q. = 1.2).

Data for the 1994- 2001 period shows a slight decline in employment at New York's medical technology firms, due to the recession. During the period these firms decreased their employment by 850 jobs.

Summary of New York State Regional Activity

Notable findings relating to regional activity in medical technology included:

Capital Region

- In 2001, 23 establishments in the Capital Region employed more than 2,200 workers in the medical technology industry.
- The region showed the third greatest regional specialization of any part of the state (after the Mohawk Valley and Central New York), with 2.2 times more employment in the industry than the national average.
- Regional employment in medical technology was concentrated in the production of surgical and medical instruments, with more than 2,200 employees in 2001.

Central New York and Mohawk Valley

- In 2001, 16 establishments in the Central New York region employed nearly 1,500 workers in the medical technology industry. 11 firms in the Mohawk Valley employed more than 1,300 workers in the industry, up 90% from 1994.
- The Central New York region showed a strong concentration of medical technology employment, with about 2.1 times more employment in the industry than would be expected, based on national level patterns. The Mohawk Valley region showed the greatest regional specialization of any part of the state, with 3.6 times more employment in the industry than the national average.
- Central New York employment in medical technology was concentrated in the production of surgical and medical instruments, with total cluster employment nearly 1,500 employees in 2001. Mohawk Valley employment was concentrated in the production of electromedical equipment, with total cluster employment more than 1,300 employees in 2001..
- Employment in the production of electromedical and electrotherapeutic apparatus in the Mohawk Valley grew more than 2.5 times – from 354 to 1014 employees – between 1994 and 2001..

[1] Note, all location quotient data is from the year 2000, because of the unavailability of comparable 2001 federal data.

Finger Lakes

- In 2001, 14 companies employed more than 1,800 people in the medical technology industry within the Finger Lakes Region, up 218% from 1994.
- The region showed a significant regional concentration in medical technology employment, with 1.6 times more employment in the industry than the national average.
- Finger Lakes employment in medical technology was concentrated in the production of x-ray apparatus and tubes, with more than 1,100 employees in 2001.
- The medical technology industries showing significant employment growth between 1994 and 2001 within the region were: x-ray apparatus and tubes and related irradiation apparatus (SIC 3844) – this sector saw employment growth of almost 700%, from 155 to 1,390; and surgical and medical instruments and apparatus (SIC 3841) – employment in this sector rose almost 200%, from 74 to 147.

Long Island

- Long Island has the state's largest number of medical technology employees – more than 2,100 people were employed in the region's 68 firms in 2001.
- The region's specialization in these industries is slightly greater than the nation as a whole.
- About 1/3 of the region's employment was concentrated in the production of surgical appliances and supplies (about 725 workers).
- Medical technology industries showing significant employment growth between 1994 and 2001 within the regions were: electromedical and electrotherapeutic apparatus (SIC 3845) - employment increased by 69% from 238 to 404; and dental equipment and supplies (SIC 3843) – this sector saw employment growth of 27%, from 366 to 465.

The Mid-Hudson Region

- In 2001, 25 businesses in the Mid-Hudson region employed more than 1,550 workers in the medical technology industry.
- Regional employment in medical technology was concentrated in electromedical equipment, with more than 1,000 employees in 2001.
- Employment at firms producing electromedical equipment showed significant growth between 1994 and 2001, from 765 to 1000 employees.

New York City

- In 2001, 47 establishments in the New York City region employed nearly 650 workers in the medical technology industry.
- Regional employment in New York City was concentrated in surgical appliances with about 300 workers in 2001.

North Country

- Six establishments in the North Country employed just over 200 workers in the medical technology industry in 2001.
- More than half of the North Country's medical technology employment was in surgical and medical instruments. This region has the state's smallest number of medical technology employees. (Please note that because of the small number of medical technology employees in this region, this region is not included in the "Regional Concentrations" section of the report).

Southern Tier

- Eight establishments in the Southern Tier employed 450 workers in the medical technology industry in 2001.
- Almost half of the Southern Tier's medical technology employment was in surgical appliances.

Western New York

- In 2001, 26 establishments in Western New York employed about 1,600 workers in the medical technology industry.
- The region's specialization in these industries is slightly greater than the nation as a whole.
- Regional employment in medical technology was concentrated in surgical appliances and supplies, and surgical instruments and devices, each with more than 730 employees in 2001.
- Employment at firms producing orthopedic, prosthetic, and surgical appliances and supplies grew from 569 to 734, or 29% between 1994 and 2001.

The Global Medical Technology Industry

With about $190 billion in annual sales (about $105 billion in the US), the worldwide medical technology industry develops, manufactures and distributes a wide range of products used to improve patient health. The industry is extremely broad-based and diversified, and has steep barriers to entry. Major medical technology companies dominating the market in terms of sales include C.R. Bard, Bausch & Lomb, Baxter International, Boston Scientific, Guidant Corp., Johnson & Johnson, Medtronic, and St. Jude Medical. But these companies are the exception in the industry, which is characterized by small companies, small markets, and short product life cycles.

The industry comprises two main sectors: medical technology products and conventional hospital supplies. Medical technology products, the industry's most profitable sector, comprise innovative high-technology items for highly specific markets. Typically targeting small patient populations, products such as sophisticated diagnostic imaging systems carry significant risk of product obsolescence. The conventional hospital supply sector comprises largely commodity-type products marketed by a relatively small number of large manufacturers; products include gloves, syringes and other disposable medical supplies. The market for these products is mature, characterized by low margins, high volume, and long-term contracts with hospital management chains and other large customers. Hundreds of small and midsize specialty medical technology companies operate in the US and throughout the world.

Demographic trends, both in the US and in many international markets, are expected to continue to contribute significantly to industry growth over the next few decades. Although the 65-and-older segment represents just under 13% of the total US population, it accounted for an estimated 40% of total healthcare expenditures in 1998. Going forward, an aging crop of baby boomers provides further evidence that industrywide demand will only grow stronger. Their greater desire to play an active role in their health care is one critical factor driving the demand for both the development of and access to new technology. And although more people are expected to live longer, they unfortunately may not be free from health problems. According to the World Health Organization (WHO), the incidence of cancer, heart disease, and other chronic diseases is expected to increase in the years ahead. This is largely because many people have unhealthy lifestyles which include smoking, obesity, poor diet, and lack of exercise. The graying of America will particularly benefit makers of cardiovascular products such as pacemakers, defibrillators, and angioplasty catheters, which are used mostly on elderly patients. Orthopedic knee and hip implants and related products are also used primarily by the elderly, as are such diagnostic imaging products as magnetic resonance imaging (MRI).

US medical technology manufacturers garner nearly half of their revenues in international markets (primarily in Europe and Japan), where their technological leadership allows for dominant market share positions in most of the leading-edge product areas. In 1999, US manufacturers exported 15.4 billion. Thus the domestic industry is affected by overseas demand, international business, and regulatory conditions, as well as by fluctuations in the dollar compared with other currencies.

Like pharmaceutical companies, medical technology manufacturers have had to adapt to the increasing influence of managed care in the healthcare marketplace. Major purchasing decisions are now being made by managers of health maintenance organizations (HMOs), preferred provider organizations (PPOs), large hospital consortiums, government agencies, and other large managed care buyers that wield substantial leverage in terms of product selection. More than 60% of all medical technology purchases in the US are made by managed care buyers, and the percentage is projected to rise to over 80% by 2005, according to the Advanced Medical Technology Association (AMTA, formerly the Health Industry Manufacturers Association (HIMA)). Managed care providers typically insist on using lower-cost products whenever possible, and they often employ therapeutic substitutions in which a less expensive therapy is used in place of a more expensive one. This policy has fostered greater reliance on low-cost pharmaceutical treatments instead of surgical procedures that use medical devices. Even when medical technology procedures are sanctioned, many managed care plans limit reimbursement to a set number of approved devices. Another trend that has affected the industry is the shift of Medicare recipients into HMOs and other managed care plans. Federal and state health agencies have intensified their efforts to encourage patients to make this move because of the cost savings such plans offer to plan sponsors.

Although cost-conscious managed care providers tend to limit the use of expensive procedures, this change is not entirely negative for the medical technology industry. Managed care plans usually cover senior adults for most inpatient and outpatient services. Similarly, managed care efforts to hold down hospital budgets have not prevented new medical devices from achieving notable commercial success. This is especially true for products aimed at reducing the length of hospital stays and overall treatment costs.

Partly as a result of pressure from third-party payors, procedures that were once conducted on an inpatient basis are increasingly being performed in less expensive outpatient settings. The growth of these facilities has boosted sales of devices and equipment. New technology has also helped fuel this trend. Devices that offer therapeutic advantages along with cost efficiencies have been the most prominent success stories in medical technology in recent years. Examples include minimally invasive laparoscopic surgical devices which shorten hospital stays, and balloon angioplasty, which often eliminates the need for more costly cardiac bypass procedures.

Price competition within the highly competitive medical technology industry is expected to intensify in coming years in both the US and international markets. Within the domestic market, several factors, including ongoing hospital consolidation and the emergence of powerful hospital supply buying collectives, have combined to exert significant pressure on medical supply prices. To offset some of the pricing pressures, several product manufacturers have created Internet-based medical product and supply auction sites. Becton Dickinson, Boston Scientific, Johnson & Johnson, GE Medical Systems, Baxter International, Abbott Laboratories, and Medtronic launched a global, independent, privately held enterprise whose Internet site facilitates the exchange of information related to the buying, selling, and distribution of medical equipment, devices, and healthcare services worldwide.

Medical technology plays a vital and indispensable role in delivering safe, effective, high-quality health care. The industry has developed life-saving and life-enhancing products such as pacemakers, artificial joints, magnetic resonance imaging (MRI), and laparoscopic devices for minimally invasive surgery. It has great potential to synthesize advances in science, bioengineering, biomaterials, genomics, computing, and telecommunications to develop innovative technologies that will extend the capacity of the health care system to prevent, diagnose, and treat disease, and to enhance health status and quality of life.

Research and Development (R&D) in Medical Technology

R&D spending varies significantly among medical technology manufacturers. Companies that primarily manufacture conventional hospital supply items usually make minimal R&D investments, while those that develop cutting-edge, high-tech devices typically maintain the highest R&D levels. The investment in R&D by the medical technology industry more than doubled during the 1990s and now stands at almost 13% of sales, more than 4 times the average for manufacturers overall. Nearly all of this research is privately funded. AMTA members, who produce nearly 90% of the health care technology products consumed annually in the US and nearly 50% of the global products, spent almost $9 billion on R&D in 1998, 18 times more than the federal government funds. Most of this private spending is for product-specific applied research, not basic research. R&D spending in this industry is now on par with R&D spending by the bio/pharma industry as a whole and is more than three times the overall US industrial average.

Venture capital (VC) firms remain an important funding source for start-up medical technology companies. While the absolute magnitude of VC funding for this industry has gradually increased, the share of total VC funding going to this industry has declined significantly. Major causes for the shift away from medical technology investment include the under-performance of recent IPOs for medical technology stocks, and the relative attractiveness of other industries (the Internet, biotechnology).

THE MEDICAL TECHNOLOGY INDUSTRY IN NEW YORK STATE

Statewide Employment

Medical technology industries are part of New York State's larger biomedical cluster. Empire State Development (ESD) defines the medical manufacturing sector to include the following industries:

- surgical and medical instruments and apparatus (SIC 3841[2]);
- orthopedic, prosthetic, and surgical appliances (SIC 3842);
- dental equipment and supplies (SIC 3843);
- x-ray apparatus, tubes, and related irradiation apparatus (SIC 3844); and
- electromedical and electrotherapeutic apparatus (SIC 3845).

Overall New York State employment in 2001 (latest available data) at medical technology firms was nearly 13,500. The State's employment in medical technology is about 5% of the national employment in the cluster. New York medical technology employees worked at more than 250 firms across the State, for average firm employment of just over 60.

ESD obtained data on employment at medical technology companies from the US Department of Labor's unemployment insurance database (ES-202 series). The following chart shows 1998 employment by region at New York State medical technology firms. About 60% of the employees (just over 9,000) in the medical technology industry work on Long Island, in the Capital region, in the Finger Lakes region, and in Western New York. Another 32% of New York State's total medical technology employment is located in the Mid-Hudson, Central New York, and Mohawk Valley regions.

Region	2001 Medical Technology Employment
Capital	2,209
Central New York	1,473
Finger Lakes	1,862
Long Island	2,137
Mid-Hudson	1,554
Mohawk Valley	1,321
New York City	638
North Country	196
Southern Tier	450
Western New York	1,605

Source: ES-202 Employment Data

Comparing the concentrations of medical technology firms in New York with national data, five regions show greater concentration ("location quotients") than the nation as a whole. The regions showing specialization are:

[2] Standard Industrial Classifications (SIC) may be found in Standard Industrial Classification Manual, Office of Management and Budget, Washington, D. C., 1987.

- Mohawk Valley (LQ = 3.6);
- Central New York (LQ = 2.1);
- Capital Region (LQ = 2.2);
- Finger Lakes (LQ = 1.6).
- Western New York (LQ = 1.2)

Data for the 1994-2001 period shows an overall employment decline of about 850 jobs, reflecting the recession. But several industries within the medical technology cluster showed a substantial increase in employment. These were x%; electromedical/electrotherapeutic apparatus (SIC 3845) – up 153%, x-ray apparatus/tubes and related irradiation apparatus (SIC 3844) – up 125%; and dental equipment/supplies (SIC 3843) – up 31%.

SIC	Industry	1994 Empl.	2001 Empl.	% Change
3841	Surgical/Medical Instruments/Apparatus	7,494	5.111	-32
3842	Orthopedic, Prosthetic, and Surgical Appliances/Supplies	4,365	3,170	-27
3843	Dental Equipment/Supplies	702	919	+31
3844	X-Ray Apparatus/Tubes, Related Irradiation Apparatus	664	1,499	+125
3845	Electromedical/Electrotherapeutic Apparatus	1,084	2,748	+154

New York State's Medical Technology Infrastructure

New York State plays a key role in the international medical technology industry. The State is a leading center for health care and medical research, and serves as a major base for clinical trials of medical technology products. New York State has a high concentration of hospitals, medical research institutions, and many of the world's leading surgeons and physicians who pioneer new practices and procedures.

Throughout New York State, there are also clusters of innovative biotechnology and pharmaceutical companies and research organizations. These companies have developed new diagnostic tests and are pioneering work in tissue structure, diagnosis, and disease that will support future innovations in the medical technology sector.

Also throughout the state, many colleges and universities offer degree programs in a number of medical technology-related disciplines such as Biomedical Engineering, Medical Laboratory Technician, and Radiological Science/Technology, to ensure a medical technology work force that will lead New York State through the 21st century.

New York has a number of leading research facilities with strengths in medical technology. They include:

- The University of Rochester's Biomedical Engineering department, which applies engineering principles and methods to understand human medical problems.
- The Broad Hollow Bioscience Park on the campus of SUNY Farmingdale is a new commercial center for bioscience research, while the North Shore University Hospital is creating a state of the art biotechnology incubator focusing on biomedical product development.

- The Center for Device Research at Columbia University is a multidisciplinary group that studies and develops new medical technologies.
- The Science and Technology Center in Nanobiotechnology at Cornell University receives NSF support for the development of miniature biomedical devices.

New York's Centers for Advanced Technology (CAT) program is charged with growing the state's investment in high technology research and economic development. The CAT program provides State funding for university research in technology areas that have commercial applications. Among those with relevant specializations are :

- The Center for Automation Technologies at Rensselaer Polytechnic Institute.
- The Center for Electronic Imaging Systems at the University of Rochester.
- The Center for Biotechnology at SUNY-Stony Brook.
- The Center for Ultrafast Photonic Materials and Applications at CUNY.

REGIONAL MEDICAL TECHNOLOGY CONCENTRATIONS

This section of the report presents regional data on New York's medical technology firms, including job growth figures for the industries listed on page 10, major and growing company profiles, and research and development resources.

Overall, medical technology employment in New York State decreased by about 6% between 1994 and 2001, due to the impact of the recession. However, employment in five regions - Finger Lakes, Mohawk Valley, Western New York North Country, and Southern Tier - showed substantial growth. Finger Lakes employment increased 118% to more than 1,850; Mohawk Valley employment was up 93% to more than 1,300; Western New York employment increased by 271 (20%), employment in the North Country increased 24% to just under 200; and Southern Tier's employment was up 16% to 450.

ES-202 Establishment and Employment Data
By ESD Region for NYS Medical Technology Companies
Ranked by Change in Employment – 1994-1998

Region	1994 Empl.	2001 Empl.	Empl. Chg. 1994-2001	% Change 1994-2001
Finger Lakes	853	1,862	1,009	+118
Mohawk Valley	683	1,321	638	+93
Western New York	1,334	1.605	271	+20
Southern Tier	389	442	61	+16
North Country	158	211	38	+24
Mid-Hudson	1,804	1,554	--250	-14
New York City	1,111	638	-473	-42
Central New York	1,950	1,473	-477	-24
Capital Region	2,784	2,209	-575	-21
Long Island	3,238	2,137	-1100	-34

CAPITAL REGION

Medical Technology Employment

In 2001, 23 establishments in the Capital Region employed more than 2,200 workers in the medical technology industry. The region showed the third greatest regional specialization of any part of the state (after the Mohawk Valley and Central New York), with 2.2 times more employment in the industry than the national average. Regional employment in medical technology was concentrated in the production of surgical and medical instruments, with more than 2,100 employees in 2001.

Selected Regional Medical Technology Companies

American Bio Medica Corporation, headquartered in Kinderhook, is a leading developer, manufacturer, and marketer of low-cost, easy-to-use onsite diagnostic products and services. The company's drug screens are sold through a global distribution network that targets businesses, schools, government organizations, hospitals, and physicians, with new sales efforts aimed at the over-the-counter (OTC) market. The company's fiscal year 2000 sales were $7.6 million, up 18% from the previous year.

CMP Industries, located in Albany, is a major manufacturer of dental laboratory materials and equipment. The company specializes in partial denture products but also produces some crown and bridge products. Between 1959 and 1986, CMP acquired six manufacturing companies in the dental laboratory sector. The company's products are marketed to 40 countries around the world, and export sales represent 35% of CMP's total sales.

The Kendall Co./Kendall Sheridan of Argyle is an operating unit of Tyco International. Tyco Healthcare is one of the largest medical device companies in the world. The Kendall business unit manufactures and markets a broad range of wound care, needles and syringes, vascular therapy, urological care, incontinence care, and nursing care products. Its products are distributed through its own sales force and through a large network of independent distributors.

Supporting Resources

Albany Medical Center is the only academic health sciences center in the 25 counties of eastern New York and western New England. The Medical Center incorporates **the Albany Medical Center Hospital,** one of upstate New York's largest teaching hospitals and **the Albany Medical College,** founded in 1839 as one of the nation's first private medical schools. The Medical Center is Albany's largest non-governmental employer, with more than 6,000 employees.

The Center for Automation Technologies located at Rensselaer Polytechnic Institute (RPI) is part of New York State's network of Centers for Advanced Technology (CATs). Automation technology is driven by demands for short product lifecycles, smaller lot sizes, mass customization, and higher precision. Core programs focusing on fundamental research at the CAT include Robotic Systems and Manufacturing Automation.

The Wadsworth Center of the New York State Department of Health, based in Albany's Empire State Plaza, employs more than 1,000 people. Its lab is perhaps the most comprehensive public health laboratory in the US. Wadsworth is part of a newly designated nanobiotech center - a consortium of research institutions led by Cornell University, and designated by the National Science Foundation (NSF).

Institutions of higher education in the region offering relevant academic programs include:

Discipline	Institution
Bioengineering/Biomedical Engineering	Rensselaer Polytechnic Institute
Electrical/Electronic Engineering Technology	Regents College
Electromechanical Technology	Regents College
Medical Lab Technician	Hudson Valley Community College
Medical Technology	The College of Saint Rose Sage Junior College of Albany SUNY Albany
Radiological Science/Technology	Hudson Valley Community College Queensbury Community College

CENTRAL NEW YORK AND THE MOHAWK VALLEY

Medical Technology Employment

In 2001, 16 establishments in the Central New York region employed more than 1,400 workers in the medical technology industry. The region showed a strong concentration of medical technology employment, with about 2.1 times more employment in the industry than would be expected, based on national level patterns. Central New York employment in medical technology was concentrated in the production of surgical and medical instruments, with more than 1,200 employees in 2001.

In 2001, 14 firms in the Mohawk Valley employed almost 1,300 workers in the medical technology industry, up 88% from 1994. The region showed the greatest regional specialization of any part of the state, with 3.6 times more employment in the industry than the national average. Mohawk Valley employment in medical technology was concentrated in the production of electromedical equipment, with more than 1000 employees in 2001, up from 354 in 1994..

Selected Regional Medical Technology Companies

ConMed, headquartered in Utica, is a medical technology company specializing in the manufacture of instruments and implants for arthroscopic medicine. It is also a leading developer and manufacturer of advanced medical devices, including minimally invasive surgical devices. The company, one of the region's largest employers, has about 1,000 workers locally, and about 2,500 employees worldwide in eight manufacturing locations. The company was founded in Utica in 1970 with two employees. 2000 sales are estimated at over $400 million.

Welch Allyn, "homegrown" in Skaneateles is one of the largest medical diagnostic equipment manufacturers in the world. Its Medical Products group is one of three separate businesses, each working independently to focus on their core markets. Welch Allyn is reaching out to the world's new markets, and is particularly interested in countries that are in the midst of recreating their health care systems.

Supporting Resources

The **SUNY Upstate Medical University (formerly the SUNY Health Science Center)** in Syracuse enrolls more than 1,100 students in its colleges of medicine, health professions, graduate studies, and nursing. It is home to the 350-bed University Hospital and an extensive network of specialty clinics. In addition, it is the region's largest employer with more than 5,000 employees. Earlier this year, the new **Institute for Human Performance** opened on its campus, and will serve as an incubator for biomedical research aimed at extending the reaches of human performance and dissolving limitations of disease, disability, and aging.

Institutions of higher education in the Central New York region offering relevant academic programs include:

Discipline	Institution
Bioengineering/Biomedical Engineering	Syracuse University
Medical Laboratory Technician	Onondaga Community College SUNY College of Agriculture and Technology at Morrisville
Medical Technology	SUNY Upstate Medical University
Radiological Science/Technology	SUNY Upstate Medical University

Institutions of higher education in the Mohawk Valley region offering relevant academic programs include:

Discipline	Institution
Electrical/Electronic Engineering Technology	SUNY Institute of Technology at Utica/Rome
Medical Lab Technician	SUNY College of Agriculture and Technology at Cobleskill
Radiological Science/Technology	Mohawk Valley Community College

FINGER LAKES REGION

Medical Technology Employment

In 2001, 14 companies employed more than 1,800 people in the medical technology industry within the Finger Lakes Region, up 118% from 1994. The region showed a significant regional concentration, with 1.6 times more employment in the industry than the national average. Finger Lakes employment in medical technology was concentrated in the production of x-ray apparatus and tubes, with more than 1,100 employees in 2001 from only 155 in 1994.

Selected Regional Medical Technology Companies

Bausch & Lomb, founded in 1853 in Rochester where it continues to have its headquarters, is the preeminent global technology based health care company for the eye. B&L has annual revenues of about $2 billion and employs over 10,000 people in 35 countries. Local B&L employment stands at about 2,000. The company manages its product lines in three reporting segments: vision care, surgical, and pharmaceuticals. The surgical segment accounted for about 25% of 1999 consolidated revenues, and consists of cataract, refractive, and other ophthalmic surgery products, excimer lasers, and diagnostic devices.

Getinge/Castle in Rochester serves as headquarters for the Getinge Americas Group, which in turn is part of Getinge Industrier AB of Sweden – a worldwide leader in sterilization and disinfection products in the healthcare and scientific marketplace. The company employs several hundred people in the region.

Eastman Kodak of Rochester develops, manufactures, and markets products for the capture, processing, presentation, distribution, and printing of health-related images. Kodak's health imaging business, with annual revenues of $2 billion, has been serving the needs of the healthcare industry for over 100 years. It is now the second largest business segment in the Kodak portfolio of imaging companies. Kodak is the world's market share leader in general radiography applications, specialty imaging applications, laser imaging systems, and both diagnostic and referral printing systems. The company remains the region's biggest employer, with more than 24,000 employees.

Ortho-Clinical Diagnostics, a Johnson & Johnson (J&J) company, is a leading provider of high-value diagnostic solutions for the global health-care community. The company is committed to developing the most advanced tests for early detection or diagnosis of disease, and it brings products to market that provide timely information and help to facilitate better medical decisions. Ortho-Clinical Diagnostics also provides blood screening and typing products that help to ensure the safety of the world's blood supply. Its parent company, with more than 99,000 employees worldwide, is one of the world's most comprehensive and broadly-based manufacturers of health care products and provider of related services. J&J has more than 190 operating companies in 51 countries around the world. Ortho-Clinical Diagnostics maintains its R&D headquarters in Rochester.

STS duoTEK, Inc. in the Rochester area was founded as Sterilization Technical Services in 1978, who then purchased Duotek in 1991. STS offers medical device manufacturers a full range of assembly, packaging, sterilization, and testing services. Two other STS companies,

STS Biopolymers and STS Particles, provide medical device coatings and pharmaceutical particles developed at STS. Over the past five years, sales at the STS companies have grown at an average annual rate of 18%. The STS companies operate four facilities in the region.

Supporting Resources

The **University of Rochester** has created a biomedical engineering department in response to growing interest in a field that many believe will be one of the most important of the 21st century. The application of engineering principles and methods to understand human medical problems could lead to the development of artificial organs, improved replacement parts for hips and knees, and better imaging at detecting tumors. In 2002 Governor Pataki presented the University Medical Center with a $30 million grant to support the Center's biomedical researh strategic plan. The grant supports the provision of space for biotech companies that commercialize discoveries made in Medical Center laboratories and provide start-up capital for these emerging companies. The new facilities and recruitment effort are part of a ten-year, $550 million initiative to dramatically expand medical research at the University of Rochester Medical Center.

The Rochester Institute of Technology's (RIT's) program in biotechnology, established in 1983, was the first bachelor's degree program in the field in the US, and it continues to be used as a model for institutions throughout the nation. RIT's Center for Biotechnology Education and Training (CBET), part of its Department of Biological Sciences, recently completed a work force assessment study, which focused on the type and level of education needed to create and foster the growth of a capable work force. The study, funded by a $150,000 grant from Empire State Development, is seen as a key step in the development of a biomedical cluster in the Rochester and Western New York regions.

Joining the University of Rochester and the Rochester Institute of Technology with industrial leaders in electronic imaging, the **Center for Electronic Imaging Systems (CEIS)** is one of the 14 New York State Centers for Advanced Technology (CATs) and is designated by the NSF as one of ten State/Industry/University Cooperative Research Centers. The Center conducts research in medical imaging and image processing.

Institutions of higher education in the region offering relevant academic programs include:

Discipline	Institution
Bioengineering/Biomedical Engineering	University of Rochester
Biological Technology	SUNY College at Brockport
Diagnostic Medical Sonography	Rochester Institute of Technology
Electrical/Electronic Engineering Technology	Rochester Institute of Technology
Electromechanical Technology	Rochester Institute of Technology
Medical Lab Technician	Monroe Community College
Medical Technology	Keuka College Roberts Wesleyan College Rochester Institute of Technology SUNY College at Brockport SUNY College at Geneseo
Radiological Science/Technology	Monroe Community College

LONG ISLAND

Medical Technology Employment

Long Island has the state's largest number of medical technology employees – more than 2,100 people were employed in the region's 68 firms in 2001. The region's specialization in these industries is slightly greater than the nation as a whole. About 1/3 of the region's employment was concentrated in the production of surgical appliances and supplies (about 700 workers).

Two medical technology industries saw significant employment growth between 1994 and 2001 within the region - firms manufacturing electromedical and electrotherapeutic saw employment jump 71%, from 238 to 404; and firms manufacturing dental equipment and supplies increased employment by 27%, from 366 to 465.

Selected Regional Medical Technology Companies

American Biogenetic Sciences Inc. in Copiague was recently ranked #1 on Deloitte & Touche's "Long Island Fast 50," a list of the region's fastest-growing technology firms. The company is a developer of tests for cardiovascular and infectious diseases, and treatments for neurological disorders like Parkinson's and Alzheimer's. ABS, with 1999 revenues of $1.44 million, saw a whopping 1,036% growth from 1995 to 1999.

Canon U.S.A., Inc., headquartered in Lake Success, is an industry leader in professional and consumer imaging equipment and information systems. Canon was established in New York City in 1955. The company employs more than 11,000 people at more than 30 facilities throughout North, Central, and South America and the Caribbean. Canon leveraged its expertise in optical technologies to enter the medical field, and now provides a full line of medical diagnostic equipment that help radiologists, clinicians, and doctors in the fields of radiology, optometry, and ophthalmology diagnose and treat patients.

E-Z-EM, Inc. of Westbury offers one of the most comprehensive lines of gastrointestinal (GI) x-ray products in the world. Net earnings for fiscal year 2000 were just under $6 million, a 24% increase over fiscal year 1999; record net sales were $112 million. The company employs about 900 people in the region. E-Z-EM has two core business segments: Diagnostic and AngioDynamics. In addition to its US headquarters and domestic manufacturing and R&D sites, the company has offices or manufacturing facilities in Canada, Puerto Rico, Belgium, the United Kingdom, the Netherlands, Australia, and Japan.

Fonar Corp. of Melville is a manufacturer of magnetic resonance imaging (MRI) machines, and is known as "The Patient-Friendly ™ MRI Company". Fonar reported fiscal year 2000 revenues of $39 million, up from $36.9 million the previous fiscal year. During the year, the company concentrated on its R&D efforts for a number of new MRI products, and worked on the necessary approval processes that will enable it to aggressively sell them.

Henry Schein, Inc. of Melville is the largest distributor of healthcare products to office-based practitioners in the combined North American and European markets. The company operates five business groups – Dental, Medical, Veterinary, International, and Technology – through a centralized and automated distribution network, which provides customers in more than 125 countries with a comprehensive selection of over 70,000 national and Henry Schein private-brand products. Henry Schein employs over 6,000 people in 15 countries, with record 1999 sales of $2.3 billion.

Olympus of Melville is a world leader in the development and application of sophisticated optical technology. Olympus has created innovative solutions for consumers, health care and industry for over 80 years. The company's health care unit is a leading manufacturer in endoscopy, surgical products, microscopes, and diagnostic systems.

Pall Corporation is a specialty materials and engineering company with broad-based filtration, separation, and purification capabilities. The company, based in East Hills, employs about 8,600 people in about 30 countries. For fiscal year 2000 Pall reported record sales of $1.2 billion and record earnings of $155 million. The company provides innovative solutions to complex filtration and separation problems in four major markets: Medical, BioPharmaceuticals, Aeropower, and Fluid Processing. In the medical market, products are specifically engineered for the filtration of blood and its components, respiration, and cardiovascular and general surgical applications.

Vasomedical of Westbury is involved in manufacturing, marketing, and supporting its EECP (Enhanced External Counterpulsation) System, a patented microprocessor-based device for the non-invasive treatment of cardiovascular disease. Between 1989 and 1996, Vasomedical was located in the Long Island High-Tech Incubator at SUNY Stony Brook. The company graduated from the incubator in 1996, and moved to an 18,000 sq.ft. facility in Westbury. ESD just announced that it will provide a $500,000 loan for the company to purchase and renovate this facility, adding 24 jobs to its current 35+-person workforce. The money will enable the company to consolidate its manufacturing operations that are currently overseas. In 1995, Vasomedical received FDA approval for its EECP system in the US, and in January of this year, the Health Care Financing Administration (HCFA) extended Medicare coverage for EECP treatment to patients who are not amenable to bypass surgery or balloon angioplasty.

Supporting Resources

Long Island is home to two business incubators specializing in biomedical technologies – Broad Hollow Bioscience Park and the North Shore-Long Island Jewish Health System (North Shore-LIJ) Biotechnology Incubator.

The **Broad Hollow Bioscience Park** is located on the campus of SUNY-Farmingdale, who with Cold Spring Harbor Laboratory are co-sponsors of the biopark, which just opened in September 2000. The biopark is a new commercial center for biosciences research that is intended to draw additional companies and jobs to the area.

Brookhaven National Laboratory's unique facilities are used to develop new applications of nuclear technology and to understand the effects of energy-related agents on human health. Researchers aim to understand genetic and biochemical processes at the molecular level. The **Cold Spring Harbor Laboratory** has become a world center for the study of molecular events that occur when a normal cell becomes cancerous. Research into the causes of cancer as well as the study of neurobiology of the brain remain the focus of the Laboratory's research programs.

The **Center for Biotechnology at SUNY Stony Brook** (CAT) focuses its research in medical biotechnology, with research programs in a broad range of areas including medical laboratory technology, and diagnostic and therapeutic products and technologies. The Center has also fostered the development of a comprehensive infrastructure to support medical technology in New York State. Chief among its accomplishments has been its role in the creation of the **Long Island High Technology Incubator (LIHTI) and the New York Biotechnology Association (NYBA).** The LIHTI program was established by the Center in 1986 in response to the demand by start-up bio/pharma companies for affordable lab space and research services. NYBA is a not-for-profit trade association dedicated to the development and growth of New York State based biomedical related industries and institutions, and to strengthening the competitiveness of the State as a premier global location for biomedical research, education, and industry. Its membership includes more than 200 biomedical companies, research institutes, and related professional services. Also at SUNY Stony Brook is a specialized research facility for Biomedical Engineering**,** which supports medical device research, design, modification, and clinical trials.

Institutions of higher education in the region offering relevant academic programs include:

Discipline	Institution
Bioengineering/Biomedical Engineering	New York Institute of Technology SUNY Stony Brook
Biomaterials	New York University
Biomedical Technology	New York Institute of Technology
Electrical/Electronic Engineering Technology	New York Institute of Technology SUNY Farmingdale
Electromechanical Technology	New York Institute of Technology
Medical Laboratory Technician	Nassau Community College SUNY Farmingdale
Medical Technology	CUNY – College of Staten Island Long Island University – C.W. Post Campus Molloy College New York Institute of Technology SUNY Stony Brook Suffolk County Community College
Radiological Sciences/Technology	Long Island University – C.W. Post Campus Nassau Community College
Veterinary Technology	CUNY - LaGuardia Community College

MID-HUDSON REGION

Medical Technology Employment

In 2001, 34 businesses in the Mid-Hudson region employed more than 1,500 workers in the medical technology industry. Regional employment in medical technology was concentrated in electromedical equipment, with more than 1,000 employees in 2001, up from 368 in 1994.

Selected Regional Medical Technology Companies

AFP Imaging in Elmsford is a medical equipment supplier whose imaging products are widely applied in dental and medical diagnostics. The company's products are distributed by several networks of independent dealers or brand labeled for other original equipment manufacturers. AFP Imaging employs more than 100 people in the region.

Bayer AG's Bayer Diagnostics unit, located in Tarrytown, announced that it plans to join the Global Health Care Exchange LLC, which is being formed by five health care companies to streamline the hospital supply business. The Global Health Care Exchange, formed by Johnson & Johnson, GE Medical Systems, Baxter International, Abbott Labs, and Medtronic, is an independent online enterprise that will facilitate the exchange of information between suppliers and customers related to buying, selling, and distributing medical equipment devices and health care products and services worldwide. Initially, the exchange will focus on the US, and sometime in 2001 it is expected to reach a worldwide audience. Bayer Diagnostics, with 1999 sales of about $1.8 billion, is one of the largest diagnostic businesses in the world.

Laerdal Medical Corporation is recognized worldwide as a leading supplier of basic and advanced life support training products and emergency medical equipment, including Resusci Anne, the world's most widely used CPR training manikin, and Heartstart Automated External Defibrillators. Located in Wappingers Falls, it is a unit of The Laerdal Company of Norway.

SEMX Corporation services a wide range of industries including data and wireless communications, semiconductors, and medical technology, manufacturing specialty materials and value-added assemblies incorporating its heat dissipation materials. The company's executive offices and manufacturing facilities are located in Armonk, with about 100 people employed locally and more than 600 employed worldwide.

Supporting Resources

The region is home to the **IBM Thomas J. Watson Research Center,** the headquarters for the IBM Research Division. The Center is the largest industrial research organization in the world with eight labs worldwide. Established in 1961, it is located in Westchester County, with sites in Yorktown Heights and Hawthorne, employing approximately 1,750 people. One of the current research projects involves healthcare management solutions – bringing advanced technology to the healthcare industry.

New York Medical College in Valhalla is among the nation's largest private health sciences universities, and is the only academic biomedical research center between New York City and Albany. More than $30 million in research and other programs sponsored by the NIH and other sources are ongoing at the university. Two hundred scientists located on campus and at affiliated hospitals advance research in heart disease, cancer, kidney disease, AIDS, Lyme disease, as well as in the neurosciences.

Three colleges/universities - Pace University, Marist College, and SUNY New Paltz - have launched a study to examine the feasibility of creating a Center for Advanced Technology (CAT) in the region. The State has contributed $250,000 in funding for this study.

Institutions of higher education in the region offering relevant academic programs include:

Discipline	Institution
Biological Technology	Manhattan College
Electromechanical Technology	Dutchess Community College
Medical Laboratory Technician	Dutchess Community College Mount Saint Mary College Orange County Community College St. Thomas Aquinas College Westchester Community College
Medial Technology	Iona College Marist College Marymount College Mercy College Mount Saint Mary College Pace University – Pleasantville/Briarcliff St. Thomas Aquinas College
Radiological Science/Technology	Orange County Community College Westchester Community College
Veterinary Technology	Mercy College

NEW YORK CITY

Medical Technology Employment

In 2001, 50 establishments in the New York City region employed more than 600 workers in the medical technology industry. Regional employment was concentrated in surgical appliances and supplies in 2001.

Selected Regional Medical Technology Company

IMPATH in New York City is in the business of improving outcomes for cancer patients. With a database of over 620,000 patient profiles, IMPATH uses sophisticated technologies to provide patient-specific diagnostic, prognostic, and treatment information to more than 7,400 physicians specializing in the treatment of cancer patients. The company works with bio/pharma and diagnostic products companies who seek to utilize its unique resources in accelerating R&D, reducing costs and enhancing drug commercialization revenues.

Supporting Resources

The New York City region is a global center for technology. The City is home to some of the nation's top research universities and medical schools.

Rockefeller University is one of the world's premier biomedical research institutions. It has been the site of many of the 20th century's most important scientific breakthroughs, including the demonstration the connection between cholesterol and heart disease. Dr. Paul Greengard, Ph.D. and head of the Laboratory of Molecular and Cellular Neuroscience at the university, was just named the recipient of the 2000 Nobel Prize in Physiology or Medicine for his discovery of how dopamine and a number of other transmitters in the brain exert their action in the nervous system. In its history, Rockefeller University has been associated with 21 scientists who have won the Nobel Prize.

Columbia University Medical Center, a key component of Columbia University, is a world leader in patient care and education in the areas of medicine, dentistry, nursing, and public health. Also a part of the Medical Center, the **Center for Device Research** is a multi-disciplinary research group dedicated to studying and developing new medical technologies, with current projects focusing on cardiovascular assist devices. The **CAT in Information Management** leverages research talent at Columbia, and combines the expertise of the Computer Science Department, the Medical Informatics Department, and the Columbia Genome Center. Along with Dr. Greengard of Rockefeller University, Dr, Eric Kandel of Columbia University, Professor of Physiology and Cell Biophysics, Psychiatry, Biochemistry and Molecular Biophysics, shares the 2000 Nobel Prize for Medicine for their contributions to the field of neuroscience. **The Audubon Biomedical Science and Technology Park,** an incubator facilitating industry-university collaboration, is located on the campus of Columbia. It is the only one of its kind in New York City, and one of only three urban biotech parks in the US.

Founded in 1898, and affiliated with The New York Hospital since 1927 and New York Presbyterian Hospital since 1998, **Weill Medical College of Cornell University** (formerly known as Cornell University Medical College) is among the top-ranked clinical and medical research centers in the country. The Medical College is divided into twenty academic departments, focusing on clinical medicine; the study, treatment, and prevention of human diseases; and maternity care. **Cornell University** has PhD programs in biomedical research and education at the Weill Graduate School of Medical Sciences, and with neighboring Rockefeller University and the Sloan-Kettering Institute (both in New York City). Weill Medical College and Graduate School maintains major affiliations with Memorial Sloan-Kettering Cancer Center, Hospital for Special Surgery, as well as the metro area institutions that constitute the New York Presbyterian Health Care Network.

Memorial Sloan-Kettering Cancer Center is frequently ranked as the top cancer center in the nation. It is the world's oldest and largest private institution devoted to prevention, patient care, research, and education in cancer.

Mount Sinai School of Medicine/Medical Center in Manhattan is internationally recognized for groundbreaking clinical and basic science research and innovative approaches to medical education. Current research projects in medical technology are being conducted at both the Cardiovascular Institute and Orthopedics Department.

The region is also home to medical centers with international reputations that specialize in rehabilitation and special surgery. These centers include the **Hospital for Joint Diseases and the Hospital for Special Surgery.**

The **State University of New York (SUNY) Downstate** in Brooklyn (formerly known as the SUNY Health Science Center) is another significant center of teaching and research in the biological sciences within the City's borders. The quality of its education, research, and patient care programs was confirmed with the awarding of the Nobel Prize in Medicine in 1998 to Dr. Robert Furchgott, a member of the School of Graduate Studies faculty since 1956. Dr. Furchgott's identification of nitric oxide as a signaling molecule important in vascular health has revolutionized care for heart, stroke, impotence, and other diseases. SUNY Downstate is the fifth largest employer in Brooklyn.

The **Center for Ultrafast Photonic Materials and Applications** at the City University of New York (CUNY) supports research and technology development in select areas of photonics that have applications in medical diagnostics, optical communications, laser development, semiconductors, and optical imaging.

Institutions of higher education in the New York City region offering relevant academic programs include:

Discipline	Institution
Bioengineering	Columbia University
Biological Technology	CUNY – York College
Dental Laboratory Technician	CUNY – New York City Technical College
Electromechanical Technology	Bramson ORT Technical Institute CUNY – College of Staten Island CUNY – New York City Technical College
Medical Laboratory Technician	CUNY – Bronx Community College CUNY – College of Staten Island CUNY – Hostos Community College CUNY – Hunter College CUNY – York College Pace University Queensborough Community College
Medical Technology	CUNY – College of Staten Island CUNY – Hunter College CUNY – York College Long Island University – Brooklyn New York University Pace University St. Francis College St. John's University Wagner College
Radiological Sciences/Technology	CUNY – Bronx Community College CUNY – Hostos Community College CUNY – New York City Technical College Manhattan College New York University St. Francis College SUNY Downstate

SOUTHERN TIER

Medical Technology Employment

In 2001, 8 establishments in the Southern Tier employed 450 workers in the medical technology industry. Almost half of the region's medical technology employment was surgical appliances and supplies, which employed nearly 200, up from less than 100 in 1994.

Selected Regional Medical Technology Companies

Corning, with headquarters in the town of the same name in the Southern Tier, creates leading-edge technologies for fast-growing segments of the world's economy. Globally, the company employs more than 33,000 people and has more than 100 manufacturing operations. Corning is a premier provider of advanced optical materials for the scientific community, specialized polymer products for biotechnology applications, and other advanced materials and technologies.

Transonic Systems of Lansing is a progressive manufacturer of biomedical flow measurement equipment. The 100-employee company, with about $10 million in sales, recently received a US Small Business Administration (SBA) award for developing a device credited with great potential for cutting medical costs and keeping kidney dialysis patients healthy. Operations at its headquarters include research, manufacturing, and sales; the company also has subsidiaries in Japan, Russia, and Europe.

Supporting Resources

In July 1999, Governor Pataki announced that New York State will provide a grant of up to $300,000 to support **Cornell University's new Science and Technology Center in Nanobiotechnology**, which received this special designation by the National Science Foundation (NSF). The Cornell University-based consortium, which includes Princeton University, the Oregon Health and Sciences University and the New York State Department of Health's Wadsworth Center, was one of only five applicants chosen from a pool of 400 who applied to the NSF for the special designation. The Cornell consortium will receive up to $19 million from the NSF to establish the new Nanobiotechnology Center (NBTC) at Cornell as part of the NSF's Science and Technology Center designation. Nanobiotechnology blends nano-fabrication (making tiny, microscopic machines) with biological systems. Nanobiotechnology will be critical in developing miniature biomedical devices.

The Center for Advanced Technology (CAT) – Biotechnology Program at Cornell University, which focuses on agriculture, the environment, food science and nutrition, and health care. The CAT defines biotech not as an industry, but as a set of tools that can be utilized by a wide range of industries for new and improved products and processes, the creation and expansion of markets, and competitiveness in the global marketplace.

Institutions of higher education in the region offering relevant academic programs include:

Discipline	Institution
Bioengineering/Biomedical Engineering	Cornell University
Biological Technology	SUNY College at Oneonta
Biometrics	Cornell University
Medical Lab Technician	Broome Community College Tompkins Cortland Community College
Medical Technology	Elmira College Hartwick College
Radiological Science/Technology	Broome Community College
Veterinary Technology	SUNY College of Technology at Delhi

WESTERN NEW YORK

Medical Technology Employment

In 2001, 25 establishments in Western New York employed about 1,600 workers in the medical technology industry. The region's specialization in these industries is slightly greater than the nation as a whole. Regional employment in medical technology was concentrated in surgical and medical instruments and surgical appliances and supplies, each with more than 700 employees in 2001.

Selected Regional Medical Technology Companies

Gaymar Industries, headquartered in Orchard Park, is a leading worldwide manufacturer of advanced medical devices. The company also provides health education resources through the Gaymar Institute. Earlier this year the company was acquired by the Cortec Group, a private equity investment firm in New York City. Gaymar employs about 200 people in the region.

Ivoclar North America is a dental products manufacturer in Amherst, looking to expand its headquarters and planning to add 100 jobs over the next five years. Ivoclar North America includes Vivadent, its dental products group, and Ivoclar, its laboratory products group. The company, a subsidiary of Ivoclar AG of Liechtenstein, currently employs more than 250 people in the US and Canada. More than 2,000 dental professionals visit the Amherst site each year for product training.

MDS Matrix in Orchard Park is a division of the health care segment of MDS Inc., Canada's largest life and health sciences company. MDS Matrix is a leading provider of emergency medical, analgesia, and anesthesia products to the medical, dental, and veterinary markets.

Mennen Medical in Clarence is the medical arm of the Charterhouse Group International, a highly diversified conglomerate. Mennen Medical is an outgrowth of the NASA Space Program, and was founded by Herb Mennen and Wilson Greatbatch. It develops and manufactures products in patient monitoring.

Wilson Greatbatch, also in Clarence, is a leading developer and manufacturer of implantable medical devices. Its customers include many of the leading manufacturers of pacemakers and implantable cardiovascular defibrillators. The company was founded by Mr. Wilson Greatbatch, who patented the implantable pacemaker in 1962. The company also maintains manufacturing and testing facilities in Cheektowaga and Wheatfield, and employs about 150 people in the region (750 companywide).

Supporting Resources

The Health Care Industries Association in Buffalo is a support organization for the region's health care industry, offering educational programs, networking, mentoring, and liaison to regulators and government agencies.

The region's support network also includes two leading medical institutions - **the Roswell Park Cancer Institute (RPCI) and the State University of New York (SUNY) at Buffalo.** Earlier this year, Roswell Park was ranked ninth by *US News and World Report* in a listing of the nation's best cancer hospitals. The Institute is the nation's first comprehensive cancer treatment, research, and education facility and one of only 34 National Cancer Institute-designated comprehensive cancer centers. RPCI is not only a medical center of excellence and state-of-the-art research facility, but also a major Western New York employer. It is currently undertaking a $241.5 million major modernization Project.

SUNY Buffalo is home to a number of leading academic programs and research, including:

- **The Hauptman-Woodward Institute** (HWI) - which has dedicated over 40 years to finding ways to prevent, treat, and cure diseases such as breast cancer, diabetes, AIDS, and polycystic kidney disease.
- **The School of Dental Medicine –** which is ranked among the top dental schools in the country, and for several years has lead the nation in federally sponsored research funding.
- **The Toshiba Stroke Research Center** – which places Western New York on the map as a center for innovative medical research and clinical practice in stroke prevention, diagnosis, and treatment. The research conducted at the Center offers significant opportunities for clinical and medical device developments.

Institutions of higher education in the region offering relevant academic programs include:

Discipline	Institution
Biological Technology	SUNY College at Fredonia
Biomedical Engineering	Alfred University
Biomedical Technology	Alfred University
Biometrics	SUNY Buffalo
Electrical/Electronic Engineering Technology	SUNY College at Buffalo SUNY College of Technology at Alfred
Electromechanical Technology	SUNY College of Technology at Alfred
Medical Laboratory Technician	Alfred University Daemen College Erie Community College Genessee Community College SUNY College of Technology at Alfred Trocaire College
Medical Technology	Canisius College Daemen College Houghton College St. Bonaventure University SUNY Buffalo SUNY College at Fredonia
Radiological Science/Technology	Erie Community College Niagara County Community College Trocaire College
Veterinary Technology	Medaille College

APPENDIX: REGIONAL MEDICAL TECHNOLOGY COMPANIES

Following are detailed tables from CorpTech's[3] 2000 database of technology companies, which provides information on selected medical technology companies in each of ESD's regions. Included in the CorpTech listing are a sampling of companies of all sizes in the regions. Please note that the figures for employees and sales are based on companywide data (and not employment within the region).

Capital Region

Company Name	City
American Bio Medica Corp.	Kinderhook
AngioDynamics, Inc.	Queensbury
Chemteks	Albany
CMP Industries, Inc.	Albany
Epimed International, Inc.	Gloversville
Intermagnetics General Corp.	Latham
Kendall Co./ Kendall Sheridan-KHPC	Argyle
N. American Medical Products, Inc.	Albany
Novalis Corp.	Albany
Sterile Technologies, Inc.	Queensbury
Stiefel Research Institute	Oak Hill

Central New York and Mohawk Valley

Company Name	City
Bristol-Myers Squibb Co./ WW Med. Grp.	Syracuse
Conmed Corp.	Utica
DHD Healthcare	Canastota
InfiMed, Inc.	Liverpool
Nasiff Associates, Inc.	Brewerton
Numed, Inc.	Nicholville
O'Brien & Gere Laboratories, Inc.	Syracuse
PAR Technology Corp.	New Hartford
PAR Vision Systems Corp.	New Hartford
Welch Allyn, Inc.	Skaneateles Falls

[3] Corptech EXPLORE Database, Corporate Technology Information Services, Woburn, MA, 2000.

Finger Lakes Region

Company Name	City
Bausch & Lomb Inc. / N. American Vision	Rochester
Boehm Surgical Instrument Corp.	Rochester
CooperVision, Inc.	Fairport
CPAC, Inc.	Leicester
Eastman Kodak Co.	Rochester
Electro Surgical Instrument Co., Inc.	Rochester
Extra Packaging Corp.	Rochester
Getinge Castle, Inc.	Rochester
Holotek	Henrietta
Innovation Packaging Corp.	Macedon
Nalge Nunc International, Inc.	Rochester
Reedco Research	Geneva
STS DuoTEK, Inc.	Henrietta
STS DuoTEK, Inc. / DuoTEK Division	Farmington
Ward's Natural Science Establishment, Inc.	Rochester

Long Island

Company Name	City
Aero Nav Laboratories, Inc.	College Point
Air Techniques, Inc.	Hicksville
Algen Scale Corp.	Hauppauge
American Biogenetic Sciences, Inc.	Copiague
American Medical Alert Corp.	Oceanside
Ames Supplies, Inc.	Bronx
Argene, Inc.	North Massapequa
Avery Laboratories, Inc.	Commack
Bio-Logic Devices, Inc.	Plainview
Buffalo Dental Manufacturing Co., Inc.	Syosset
Buxton Medical Service Corp.	Amityville
Canon USA, Inc.	Lake Success
Center Laboratories, Inc.	Port Washington
Columbia Dentoform Corp.	Long Island City
Crosley Medical Products, Inc.	Deer Park
Curative Health Services, Inc.	Hauppauge
Diagnostic Technology, Inc.	Hauppauge
Diapulse Corp. of America	Great Neck
Dyna Rad Corp.	Deer Park
E-Z-EM, Inc.	Westbury
Enteric Products, Inc.	Stony Brook
Enzo Biochem, Inc.	Farmingdale

Long Island

Company Name	City
Enzo Diagnostics, Inc.	Farmingdale
Flexbar Machine Corp.	Islandia
Fonar Corp.	Melville
George Tieman & Company	Hauppauge
Graham-Field Health Products, Inc.	Bay Shore
Henry Schein, Inc.	Melville
Hitachi Denshi America, Ltd.	Woodbury
ILC Industries, Inc.	Bohemia
Interactive Consulting, Inc.	East Norwich
Introtek International	Edgewood
Langer Biomechanics Group, Inc. (The)	Deer Park
Lifestar Response Corp.	Holtsville
LinkTech, Incorporated	Bohemia
Luitpold Pharmaceuticals, Inc.	Shirley
Magna-Lab Inc.	Edgewood
MDI Consultants, Inc.	Great Neck
Medical Action Industries, Inc.	Hauppauge
Netech Corp.	Hicksville
Nikon, Inc. / Instrument Group	Melville
Nuclear Equipment Chemical Corp.	Farmingdale
OccuNomix International, Inc.	Port Jefferson Station
Olympus America Inc.	Melville
OmniCorder Technologies, Inc.	Stony Brook
Pall Corporation	East Hills
Parkell, Inc.	Farmingdale
Polar Electro, Inc.	Woodbury
Popper and Sons, Inc.	New Hyde Park
Precise Optics/PME, Inc.	Bay Shore
Qosina Corp.	Edgewood
Rozinn Electronics, Inc.	Glendale
S&S X-Ray Products, Inc.	Brooklyn
Schick Technologies, Inc.	Long Island City
Schwed Co., Inc.	Kew Gardens
Scientific Industries, Inc.	Bohemia
Spectronics Corp.	Westbury
Sterling Vision, Inc.	East Meadow
Tecnomed USA	Bay Shore
TREX Medical Corporation / Bennett Division	Copiague
United Business Technologies, Inc.	Baldwin
UNIVEC, Inc.	Farmingdale
V.I. Technologies, Inc.	Melville
Vasomedical, Inc.	Westbury
Virtual 3-D Technologies Corp.	Edgewood
W.A. Baum Co., Inc.	Copiague

Mid-Hudson Region

Company Name	City
AFP Imaging Corporation	Elmsford
American Biotec Corp.	Ossining
Bayer Corp. / Diagnostics Division	Tarrytown
BioDesign Inc. of New York	Carmel
Biomedical Enterprises, Inc.	Mamaroneck
Carl Zeiss, Inc.	Thornwood
Corteks, Inc.	Thornwood
Crown Delta Corp.	Yorktown Heights
Del Global Technologies Corp.	Valhalla
Epigen, Inc.	Millbrook
Ertel Engineering Co.	Kingston
Hitachi Medical Corp. of America	Tarrytown
International Business Machines Corp.	Armonk
J.F. Jelenko & Co.	Armonk
Laerdal Medical Corp.	Wappingers Falls
Lensland Co.	Mamaroneck
Lorex Industries, Inc.	Poughkeepsie
Luxo Corp.	Port Chester
Medical Laboratory Automation, Inc.	Pleasantville
Micro Bio-Medics, Inc. /Healer Products Div.	Pelham Manor
NDL Organization, Inc. (The)	Peekskill
New Potency Products, Inc.	White Plains
NovaSonics, Inc.	Rye
Pharmaceutical Discovery Corporation	Elmsford
SEMX Corp.	Armonk
Vicon Fiberoptics, Inc.	Pelham Manor
Wise Optical, Inc.	Yonkers
Xylum Corporation	Scarsdale

New York City

Company Name	City
Analytica Group, Ltd. (The)	New York
Anatole J. Sipin Co., Inc.	New York
Biofeedback Instrument Corp.	New York
Bristol-Myers Squibb Co.	New York
Carter-Wallace, Inc.	New York
Chromatics Color Sciences International, Inc.	New York
Colgate-Palmolive Co.	New York
Daxor Corp.	New York
Embryo Development Corp.	New York
Excel Technology, Inc.	New York
Frantz Imaging, Inc.	New York
Frantz Medical Development, Ltd.	New York
Impath, Inc.	New York
OCG Technology, Inc.	New York
Ogden Corp.	New York
Pfizer Inc	New York
Starr Medical Instruments, Inc.	New York
Toray Industries America, Inc.	New York
Transderm Laboratories Corporation	New York
Unisar, Inc.	New York

Southern Tier

Company Name	City
Co-Optics Group, Inc.	Oneonta
Corning Inc.	Corning
Corning Inc./Science Products Division	Big Flats
Culture Kits, Inc.	Norwich
Transonic Systems, Inc.	Ithaca

Western New York

Company Name	City
AMD-Ritmed, Inc.	Buffalo
Apollo Research Corp.	West Seneca
Buffalo Computer Graphics, Inc.	Buffalo
Buffalo Filter	Amherst
Cellular Products, Inc.	Buffalo
CLI Oncology, Inc.	Jamestown
Curbell, Inc.	Orchard Park
Dakmed, Inc.	Buffalo
Electro-Dyn Electronic	Niagara Falls
Ethox Corp.	Buffalo
Ferraris Medical, Inc.	Holland
Fray Products Corp.	Buffalo
Gaymar Industries, Inc.	Orchard Park
Gordon Instruments, Inc.	Orchard Park
Great Lakes Orthodontics, Ltd.	Tonawanda
Hard Manufacturing Co.	Buffalo
Harmac Medical Products, Inc.	Buffalo
IMMCO Diagnostics, Inc.	Buffalo
Koul Laboratory	Buffalo
MDS Matrix	Orchard Park
Mennen Medical Corp.	Clarence
Mentholatum Co., Inc. (The)	Orchard Park
Payton Scientific, Inc.	Buffalo
Trinity Biotech USA	Jamestown
Wilson Greatbatch, Ltd.	Clarence

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