



LABOUR MARKET REVIEW SERIES: VOLUME 2

Medical Technology

Collins McNicholas
Recruitment & HR Services Group

 **ENGINEERS
IRELAND**



Executive Summary

Ireland's medical technology industry:

There are over 450 medtech companies in Ireland and 60% of these are indigenous SMEs.

Second largest exporter of medtech products in Europe with €12.6 billion worth of exports annually.

70% of medtech companies are engaging in Research and Development activities.

The global medtech market is expected to grow by 4.1% annually, reaching €477.5 billion by the end of 2020.

Over 2,000 jobs have been created in the medtech sector since 2014 and another 4,000 jobs were estimated to be created by 2020.

Irish medtech start-ups have raised more than €178m in finance over the past two years.

Nine of the world's top ten medical device manufacturers have operations in Ireland.

Ireland produces a wide range of medical device products, including 33% of the world's contact lenses, 75% of global orthopaedic knee production and 30 million people rely on an injectable device manufactured in Ireland.

With five clinical research facilities, Ireland is ranked number one globally for the exchange of technology and ideas.

The Irish government has committed funding to three new apprenticeship schemes for the medical technology and polymer sectors, with a target of registering 1,100 people for these apprenticeships by 2025.

eHealth Ireland estimates that there are 179 Digital Health companies with over 2,300 employees in Ireland.

The medtech industry is the number one industry for innovation globally, with 8% of sales being invested in R&D and a new patent filed every 50 minutes.



Introduction

The medtech sector is one of the largest employers in Ireland and indeed one of the largest employers of professionals in Europe employing over 40,000 people across 450 companies.

Ireland is the second largest exporter of medtech products in Europe with **€12.6 billion worth of exports annually**. In July 2020, the exports of medical and pharmaceutical products accounted for **37% of total exports at €4,934m**, this is a €624m increase compared to the previous year. Ireland develops some of the most sophisticated products in the industry, with particular strengths in manufacturing and R&D.

70% of medtech companies are engaging in Research and Development activities and this figure will grow in subsequent years as companies continue to integrate new technologies into their existing products and develop new products. There are over 450 medtech companies in Ireland and 60% of these are indigenous SMEs. The global medtech market is expected to grow by 4.1% annually, reaching **€477.5 billion by the end of 2020**, this presents the Irish medtech sector with an excellent opportunity to grow. Ireland is today considered a global hub for medical technology and has greatly contributed to employment growth in recent years.

As referenced in Engineers Ireland's recently published **State of Ireland report 2020**, Engineering a green and digital recovery: "During the COVID-19 pandemic, engineers around the world supported those at the frontline through the delivery and development of medical supplies and new innovations for protecting healthcare workers and wider society. The pandemic, however, also highlighted the vulnerability of many of our social and healthcare systems."

The report also says: "Building increased resilience into these systems in the coming months and years will be crucial in order to assist in mitigating... future pandemics." The report adds: "The pandemic has also demonstrated our ability to make dramatic improvements for the good of society, including innovation in healthcare technology."

Collins McNicholas believes the outlook for the Medical Device industry in Ireland will continue to be positive beyond 2020 and anticipates strong growth in the years ahead as the industry takes advantage of the expanding global demand for medical technologies. Critical to Ireland's position will be its ability to provide enough qualified professionals for the industry. Over 2,000 jobs have been created in the Medical Technology sector since 2014 and another **4,000 jobs are expected to be created up to 2020**. Through a combination of increased graduate output, a greater number of retraining and apprenticeship programmes, and the judicious sourcing of international talent, Ireland should be able to provide the quantity and calibre of talent that the industry needs to thrive.

Nine of the world's top ten medical device manufacturers have operations in Ireland. Companies such as Abbott, Medtronic, Johnson & Johnson, Hollister, Baxter, Boston Scientific and Stryker all have major operations in the country. Indigenous companies are also important contributors to the Irish Medical Device sector. Creganna (TE Connectivity), Trulife, VistaMed and SteriPack are just a few of the Irish medtech companies exporting their products globally.



Overview from Engineers Ireland

Ireland is one of Europe's largest centres for medtech companies, employing over 32,000 people. Engineers Ireland says this broad sector holds very attractive career options for engineers, whose problem-solving skills, combined with technological advances in areas such as automation and robotics, data analytics and sustainability, makes Ireland world-class in medtech product innovation, leading to improvements in patients' lives.

Engineers Ireland, which is the professional membership body for engineers on the island of Ireland, welcomes members working across the spectrum of engineering. Its engineering community gives engineers in medtech the opportunity to share best practice across sectors and provides opportunities to hear from peers and experts on a wide range of topics. Key areas of interest include project management, low carbon technologies, digitalisation of manufacturing including cyber-physical systems, machine learning and data visualisation. Its members can deepen their knowledge and CPD and work to achieve the title of Chartered Engineer. Each year the organisation publishes a report on insights into the profession including on engineering perspectives, education and employment. The report includes a number of survey results and in its most recent report, it indicates that the public expect engineers to have a priority role in healthcare; its Engineering 2020, report states that when asked, the public expects science, engineering and technological innovation to have the most positive impacts on three areas in particular: health, climate change and education with health (and medical care) coming out on top.

Ireland produces a wide range of medical device products, including 33% of the world's contact lenses, 75% of global orthopaedic knee production and 30 million people rely on an injectable device manufactured in Ireland. Other products manufactured in Ireland include pacemakers, cardiovascular stents, pregnancy tests, HIV tests, orthopaedic hips, and ventilators. Investment has occurred in several medtech hubs across Ireland and the type of employment created includes high value manufacturing roles, support services and R&D.

R&D continues to grow in importance in the Irish Medical Device sector; with five clinical research facilities, Ireland is ranked number one globally for the exchange of technology and ideas. Medtronic, Cook Medical, SMT, Stryker and DePuy Synthes all announced investments in new R&D and Innovation Centres in the last five years. Edwards Lifesciences' announcement of its increased investment to more than €160m in the Midwest region demonstrates Ireland's continued ability to attract significant international investment. It also highlights the depth of engineering talent that is present across the country. The continued availability of this talent will be a key factor in acquiring more investment in the increasingly competitive global medtech sector.

Recent major investments in Ireland

2018
Abbott
Donegal: 500 Jobs

Feb 2019
GW Plastics
Sligo: 200 Jobs
€5.7M

Sept 2019
Fort Wayne Metals
Castlebar: 80 Jobs
€10M

June 2019
Boston Scientific
Galway
€60M

April 2019
J&J Vision Care
Limerick: 100 Jobs
€100M

2018
Edwards Lifesciences
Limerick: 600 Jobs
€160M

July 2018
BD (Becton Dickinson)
Limerick: 185 Jobs
€21M

Jan 2019
DePuy Synthes
Cork: 30 Jobs
€36M



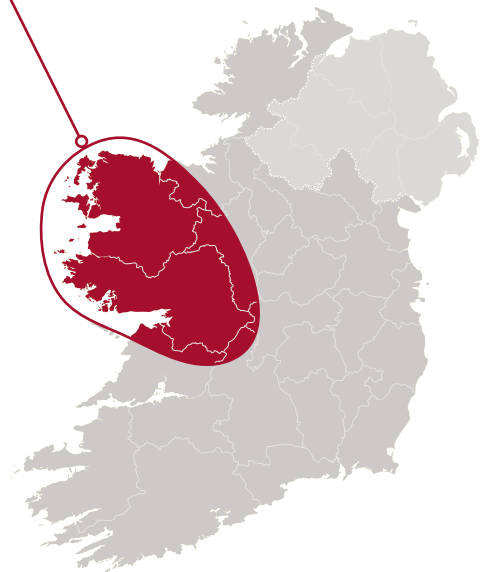
Regional Overview

Medical device companies are dispersed throughout Ireland. Their presence means that there is a continuous supply of talent in every region, allowing medical device companies to easily set up a facility anywhere they choose. A renewed focus on regional investment from IDA Ireland should see further gains in employment for regional locations, particularly in this sector. The presence of these multinationals around the country has generated an ecosystem of support companies in tool making, polymer processing and automation. Infrastructure developments put in place to support these multinationals benefits the broader economy greatly as well.

West

Galway is the most important medtech cluster in the country. Galway has a vibrant ecosystem of medical technology start-ups, multinationals and research centres that employ over 8,000 people. Galway has significant expertise in vascular technologies, which are dominated by Boston Scientific and Medtronic. Boston Scientific is the largest medical device employer in Ireland with a [staff of around 5,700 in their Clonmel, Cork and Galway locations](#). Its range of products include drug eluting stents, structural heart products, pacemakers and Implantable Cardiac Defibrillators (ICD). Boston Scientific, a global leader in medical technology, employs approximately 3,700 people in Galway covering all aspects of product design & manufacturing and in 2019, unveiled a [€60m expansion](#) including a new Equipment Technology Centre at its Ballybrit site in Galway. Medtronic, the world's number two medical device maker, has been present in Ireland since 1999 and today has [over 2,000 people working at its Global Manufacturing and Technology Development Centre in Galway](#), including over 100 employees dedicated to R&D. One of Medtronic's facilities in Galway has been a main manufacturer of ventilators used in the fight against COVID-19.

Creganna Medical, part of TE Connectivity, has been named as one of the [Fast Company Best Workplaces for Innovators in 2020](#). They are one of the top ten medical device outsourcing providers in the world, providing outsourced solutions for medical device companies and employing over 1,100 people worldwide. With three facilities based in Galway they [employ over 550 people in Ireland](#). The company was founded in Ireland in 1980 and is the country's largest indigenous company serving the Medical Device industry. Integer Holdings Corporation 'Integer', a leading medical device outsource manufacturer, announced the opening of the Galway Research and Development Innovation Centre in Ireland and have subsequently announced the development of another manufacturing facility in Brockagh, Co. Galway, which will expand their numbers



West (continued)

onsite – this currently stands at 360 employees. Other notable companies in Galway include Merit Medical, Aran Biomedical, Cerenovus and Zimmer Biomet. The Medical Device industry in Galway is continually expanding, with exciting companies such as Phenox, Versono Medical and WhiteSwell all entering the market in the past year.

Mayo has several large multinational medtech companies with manufacturing operations, including Baxter and Hollister. They produce renal dialysis equipment and ostomy/continence care products, respectively. Hollister invested **€80m in its Ballina plant in 2014**, which currently employs over 600 people. A wonderful development for the medtech community in Mayo was the announcement and subsequent opening of Meissner Filtration Products in Castlebar. Meissner took up residency in the brand new 34,000 sq. ft Advanced Technology Building constructed by the IDA in Castlebar, and the company have **plans to expand this further to 100,000 sq. ft.** Meissner have also purchased the adjacent land in order to more than triple the size of the facility's current footprint. Meissner plan to install a substantial state of the art cleanroom within the existing facility to be used for the manufacturing of Single-Use Systems (SUS) that support their biopharma and pharma client base. Over the next five years they expect to **bring at least 150 new jobs to the region.** Fort Wayne Metals in Castlebar have also expanded in the past 12 months – their new 45,000 sq. ft manufacturing facility represents an **investment of €10m and is set to create up to 80 new jobs** in the region over the next five years.

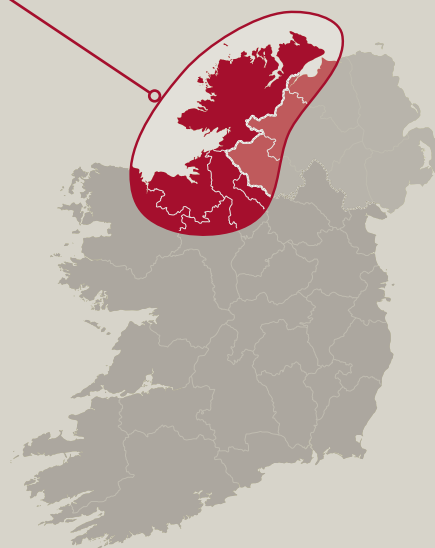
The National University of Ireland, Galway and Galway Mayo Institute of Technology have important links with medical device companies operating in the region, providing research collaboration and skilled graduates ready to specialise in the Medical Device industry.

North West

The North West is home to several large medtech companies. Abbott has a number of facilities in the region including Abbott Diabetes Care in Donegal and Abbott Diagnostics and Abbott Nutrition in Sligo. Abbott Diabetes Care has recently begun manufacturing its Freestyle Libre in Donegal which has seen a large expansion on site. Abbott Diagnostics in Sligo has been chosen as **the only Abbott Ireland manufacturer of the company's new ID Now COVID-19 test**, which has also seen an increase in employment in the North West region. The region supports both large multinationals and indigenous companies, with Irish-owned Arrotek, Inmo-tech and iNBLEX Plastics based in Sligo and Prior PLM Medical in Carrick-on-Shannon. Multinationals AbbVie, B. Braun, Phillips-Medisize, ICU Medical and Amcor Flexibles are all located in Sligo as well. Other companies in Donegal contributing to the North West medtech cluster are Phillips-Medisize, Zeus and Moll Industries. Nordson MEDICAL in Boyle, Co. Roscommon is another significant medtech manufacturing site in the North West.

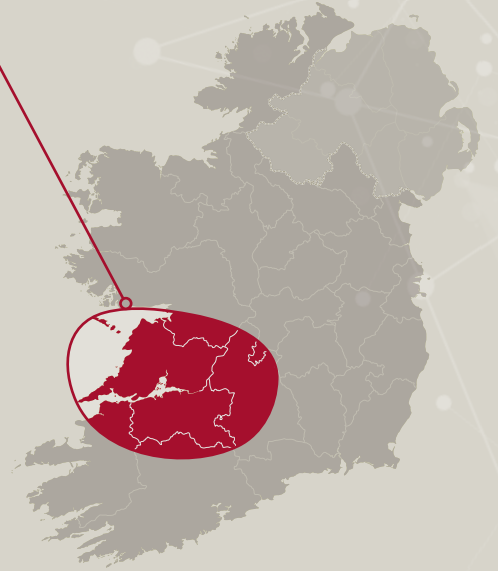
The sector continues to grow with a number of investments and job announcements in the last few years. Harmac Medical Products in Castlerea employs approximately 300 people and has recently announced it is expanding its workforce by 60 to manufacture substantial amounts of surgical masks for its multinational clients. AbbVie announced in Jan 2018 **a €113m investment to create 100 new jobs over three years.** VistaMed, which makes precision extrusions and catheters, doubled the size of its Carrick-on-Shannon plant.

The industry has also given rise to a diverse range of support companies to serve the sector. These include automation companies such as ATS, Ward Automation and SL Controls; metrology companies such as Verus and specialist tooling companies such as Avenue Mould Solutions, which was bought by GW Plastics in July 2017 and is now under the Nolato Group after their **acquisition of GW Plastics in 2020.**



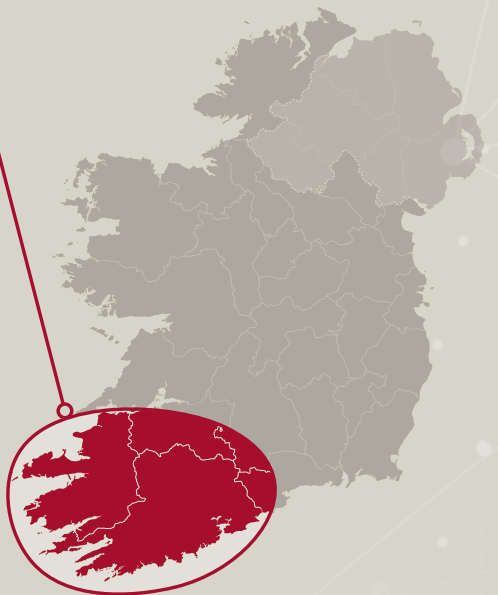
Midwest

Limerick has also become an important location for medical device companies. Cook Medical has an **800-person manufacturing facility in Limerick** that makes products for use in gastroenterology, urology, obstetrics and gynaecology. Stryker Orthopaedics, Teleflex Medical and Johnson & Johnson Vision Care are all important employers in the county. Vision Care, formerly known as Vistakon and part of the J&J group, employs almost 1,000 people in Ireland. They made a landmark **€100m investment in April of 2019** that will see the creation of 100 additional jobs at its Limerick site where they manufacture the Acuvue range of disposable contact lenses. **Becton Dickinson invested €21m in the development of a new R&D Centre of Excellence** that created nearly 200 new job opportunities across their two sites in Limerick. Edwards Lifesciences is constructing a **purpose-built manufacturing site in the Midwest at a cost of €160m**. Their Shannon facility opened in May 2018 and the new green facility is expected to open in Castletroy, Limerick in early 2021 where 600+ staff will be employed. Edwards Lifesciences make cardiovascular health products. The University of Limerick has a strong engineering department that offers a specialised Biomedical Engineering Degree in addition to its other engineering programmes.



South

Cork has significant expertise in orthopaedic technologies. Stryker, which manufactures orthopaedic implants, minimally invasive surgical equipment and neurovascular products, is the biggest medical device employer in Cork. Stryker has five facilities located in Ireland employing approximately 3,500 people. The Stryker Ireland Campus consists of four manufacturing sites and a Research and Development Innovation Centre which received **over €200m investment for Research, Development and Innovation projects in 2019**. Recently they officially acquired rival Wright Medical, who employ 200 people, **in a deal worth €4.85 billion** which will boost its exposure within the fast-growing orthopaedics market. DePuy Synthes produces orthopaedic knees and hips from its Cork plant, which received a **€36m investment for R&D projects at the DePuy Synthes Ireland Innovation Centre in Cork**, creating 30 additional high-quality positions. Boston Scientific employs approximately 800 people in Cork and produces over 5.5 million units which includes active and access catheters, occlusion coils and microspheres, inflation devices and atherectomy devices. Alcon is another significant manufacturing facility in Cork that **employs more than 450 people in the production of Intraocular Lens**. Tecomet, Symmetry Medical inc., an outsourced manufacturing company for medical device companies, employs over 140 people in its plant in Middleton in East Cork.



South East

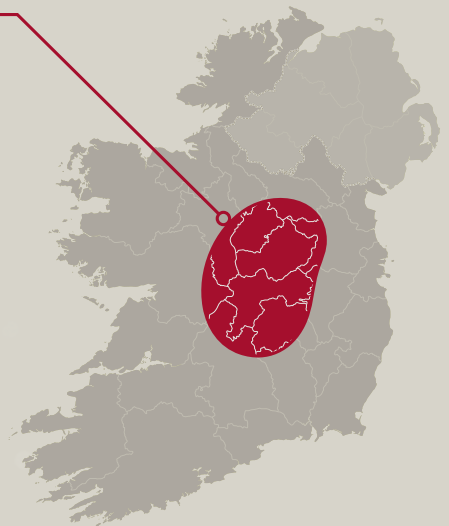
Waterford hosts contact lens manufacturer Bausch & Lomb and precision engineering company Schivo Medical. Currently employing nearly 1,500, Bausch & Lomb have **invested €85m to increase its manufacturing capacity adding 125 jobs**. Thus far, they have invested over €200m in their Waterford facility. Waterford based Nypro Healthcare manufacture its complex respiratory and injection devices while, ClearStream in Enniscorthy, which was acquired by C.R. Bard (owned by Becton Dickinson), **now has over 450 employees at their facility** and manufactures angioplasty catheters that are used in both coronary and peripheral procedures to unblock arteries. Boston Scientific employs over 900 people in Clonmel and manufactures pacemakers and implantable defibrillators for the global market. The Clonmel facility is also involved in R&D for its next generation of Cardiology Rhythm Management devices. Abbott Vascular, also located in Clonmel, employs circa 1,200 people and manufactures a host of vascular devices for the international market. Lake Region Integer Corporations Holding, based in New Ross, develops and manufactures medical devices and components for the Cardio and Vascular, and Advanced Surgical markets and **employs more than 800 people in the region**.

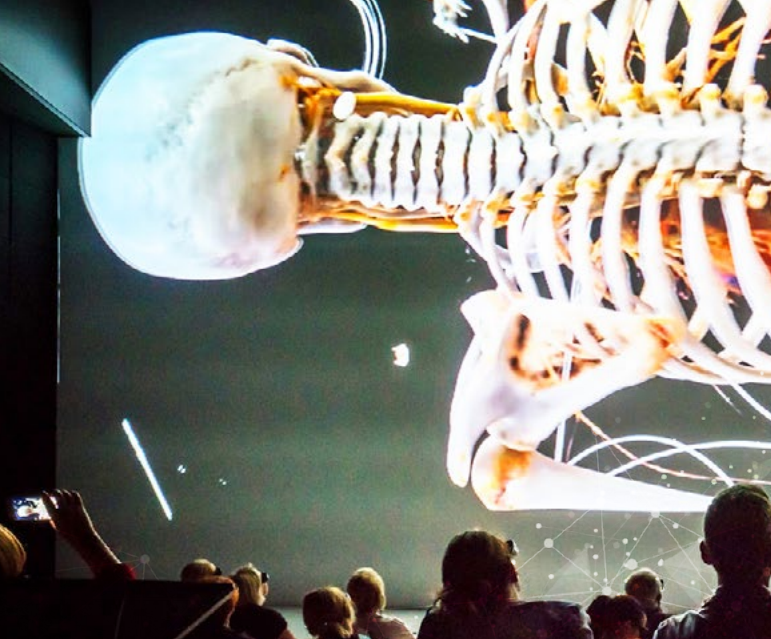
Medentech is headquartered in Wexford with distribution agents in over 140 countries worldwide. Medentech produce a comprehensive range of hospital surface disinfectants in tablet form and **employs over 100 people**. In 2018 they joined with Hypred, Antigerm, LCB Food Safety, G3 & Kilco and formed Kersia. **Teva employs around 800 people in Ireland**, their Waterford site is responsible for the manufacturing and development of respiratory products such as metered dose inhalers (MDIs) and breath-actuated inhalers for supply to the United States and around 30 other global markets.



Midlands

Athlone hosts a number of multinational medical device companies such as KCI, Covidien/ Medtronic and Teleflex all located there. Other notable companies in the region include Abbott Diagnostics, Avery Dennison (formerly Finesse Medical) and B. Braun in Longford. With the exception of Teleflex, these companies are all involved in the manufacturing of medical device products, from diagnostic kits and advanced wound care products to an assortment of medical tubing. Teleflex have their European HQ in Athlone from which they run a centre of excellence for most functions (including quality, regulatory, engineering, finance, customer service for EMEA, HR, Marketing and IT). Teleflex currently employs **in excess of 350 staff in Athlone and is set to add a further 100 jobs** over the coming years. Renew Health established its manufacturing and R&D functions in Athlone in June 2014. Integra LifeSciences are continually investing in their site in Tullamore. They have expanded to over 130 staff and are continuing to refurbish and reinvest in their facilities to increase automation and facilitate the development of new products. Isotron Ireland is also located in Tullamore. STERIS Solutions (Synergy Health, based in Tullamore, was **acquired by STERIS Solutions and is now part of a global organisation**) is continually investing and adding new clients for their sterilisation and various contract solutions to the Life Sciences industry. Biotech Vision Care, formerly Moss Vision, established in 2014 in Roscommon manufactures contact lenses and is continuing to expand its product base over the coming years. The midlands region is also home to several polymer companies who provide polymer solutions and outsource manufacturing to the Medical Device industry, for example – Kelpac Medical, Tool and Plastics, Mergon, Trend Technologies and SteriPack/Bemis (**acquired by Nelipak** and continuing to invest in the midlands site). Signature Orthopaedics, an Australian headquartered organisation, has **established its first European manufacturing plant in Westmeath in 2018 and is in the early stages of expansion**.





Medical Device Talent and Graduate Output

Skills in Demand

COVID-19 has put the global medtech industry at centre stage with unprecedented demand for diagnostic tests, personal protective equipment (PPE), ventilators and other critical medical supplies. In addition to the extraordinary measures to rapidly ramp up manufacturing capacity and capabilities, the demand for talent was certainly seen in this sector during 2020 to assist such ramp-up activity.

The demand nationally for a range of engineering professionals continued during 2020 and will do so into 2021. Due to rising demand within the industry, engineering salaries have increased marginally in the last two years. Compared to other medtech hubs in Europe, salaries in Ireland remain competitive and salary increases have been relatively minor overall. As the demand is set to remain strong over the next few years there will continue to be some pressures on supply in certain areas. The continued output of new engineers, the dispersed existence of current engineering expertise, and the experience of higher education institutions in meeting the demands of global medical device companies, however, will ensure that there is no critical shortage of engineering skills in the field.

The Irish Medtech Association Skillnet surveyed senior business leaders in the industry to estimate the level of demand for different skills. Engineers make up the second-largest cohort of employees in the industry, after operators. The development of new technological trends will impact hiring decisions with demand for data analysts (56%) and scientists (74%) increasing substantially, albeit from a low base. This reflects the increased potential of big data and drug-device

combinations for developing new products. New technologies will generate a need for more regulatory and validation experience over the next three years as well. The need for the usual support services, supply chain, sales and marketing, finance, HR, etc. will also grow with the industry.

Employees with qualifications in the biological sciences, chemistry and pharmacology are also becoming increasingly important to the medtech industry in Ireland. The convergence of different technologies with medical device products means that there is a demand for expertise in the areas of nanotechnology, software, ICT, maths, statistics, informatics and bioprocessing, and material science. There has been an increase in the pace of automation as the industry in Ireland shifts towards the production of more high-value products. This requires greater training for employees in the industry and places more pressure on third level institutions to produce the necessary volume of graduates. Overall, this would improve the quality of employment in the sector and increase the competitiveness of Ireland globally.

Graduate Pool in Ireland

The medtech sector has continued to be of huge interest to students when considering their college choices and there is no doubt that Ireland's medtech sector can offer people rewarding careers, developing and producing lifesaving technology. Sustained efforts at encouraging STEM careers and the provision of conversion courses should ensure there are enough graduates with the appropriate skillsets.

Students applying to the CAO during 2020 had a greater choice available to them than in previous years. A €24m investment by the State has allowed 22 higher education institutions to offer almost 3,000 new places on 138 full-time undergraduate courses for autumn 2020 and 2021. The high priority skills areas focused upon in the new courses include science, engineering, ICT and construction.

The government is devising a new apprenticeship programme in consultation with industry to provide more skilled professionals at the technician level. This will further bolster the supply of qualified personnel for the Medical Device industry.

Engineers Ireland in its State of Ireland report 2020 - Engineering a green and digital recovery, says that it welcomes the Government's; "STEM Education Policy Statement 2017-2026, which includes targets such as: increasing by 20% the total students taking Chemistry, Physics, Technology and Engineering for Leaving Certificate; increasing by 40% the number of females taking STEM subjects for Leaving Certificate; and building robust and sustainable partnerships between schools, business and industry, public sector bodies, research organisations, further and higher-level institutions and the arts." Progress made against these targets should be continued by the new Government, the professional body for Ireland's engineers states.

ICT skills are playing an increasing role in the Medical Device industry, particularly in the area of connected health. Government efforts to increase the ICT graduate output have been very successful, but the rapidly expanding incorporation of ICT into other industries means that a greater increase in graduate output is required in order to keep pace with this rise in demand. The government sponsored Springboard programme provided 9,463 places in ICT courses for students between 2011 and 2016. In 2015, they offered 42 ICT courses, with this number rising to 92 courses in the 2017/18 academic year. This again has increased to 5,994 places in 99 courses in 2020. All of this has helped address the demand for ICT professionals.

Springboards' Human Capital Initiative (HCI) Pillar 1 offer incentivised places for graduates to reskill in areas of skills shortage and emerging technologies e.g. ICT, High End Manufacturing, Data Analytics. From June 2020, Human Capital Initiative (HCI) Pillar 1 offers 5,891 places on 93 graduate conversion courses. These courses cover a wide range of skills areas, including artificial intelligence, smart factory technology, sustainable energy, and medical device technology. In addition to the demand for the major technical skills, highly qualified staff are also needed in support functions such as regulatory affairs, HR, finance, ICT and sales. Irish third level institutions will be able to match demand for these skillsets going forward.



The Irish government has committed funding to three new apprenticeship schemes for the medical technology and polymer sectors, with a target of registering 1,100 people for these apprenticeships by 2025.

Senior & Executive Talent

The demand for senior and executive talent within the medtech space is a constant and many organisations develop their talent internally by offering excellent career path opportunities to consider. There are also many Irish expats in these positions in medical device companies globally. This has benefitted the Irish Medical Device industry significantly. They have helped to promote Ireland around the world and made Ireland a more attractive destination for FDI. In the last decade, many have also returned to Ireland, either to develop a new medical device organization or to take over the operation of an established facility. Collins McNicholas has seen several examples of this, having undertaken many international recruitment searches on behalf of medical device companies operating in Ireland to find senior and executive talent. These experienced Irish expats will often have worked across several divisions within a company giving them a broad, as well as a deep, knowledge of the operation of medical device companies. They know the business well, but they also have a strong network within the parent group which can help attract investment to Ireland.

International assignments are often viewed as a way of fast tracking your career and talented senior level executives in the medtech industry in Ireland will often look for international opportunities to enhance their prospects in the future. They are viewed by Irish executives as attractive opportunities to further progress their careers.



Sectoral Trends in Ireland

Developments in digital health and personalised medicine are enabling development of more customised medical technology products including combination products, companion diagnostics, connected health solutions and digital therapeutics and innovative delivery mechanisms.

Medical device companies in Ireland perform a wide variety of activities, such as R&D, clinical and preclinical trials, manufacturing, marketing and sales, and shared services. Ireland has particular expertise in diagnostics, orthopaedics, vascular technology, combination devices and connected health. As a result, [nine of the world's top ten medical device manufacturers have operations in Ireland](#) and there are excellent employment opportunities in this sector for a wide range of skills.

Combination Devices

Combination devices bring together two different medical technologies in a single product. Types of drug device combinations include drug eluting stents, antimicrobial catheters, and infusion pumps. Ireland has several companies operating in this sector. AbbVie in Sligo manufactures a pen-style injector for its biopharmaceutical products. Boston Scientific manufactures drug eluting stents from its Galway facility. ClearStream Technologies is also involved in the production of drug-eluting stents and antimicrobial catheters from its facility in Enniscorthy. The market was estimated to grow by 7.9% per year to 2019 when it would be valued at \$115 billion, according to Transparency Market Research. Developments in material science and nanotechnology will assist the rapid expansion in combination devices.

Ireland's knowledge of pharmaceutical and biopharmaceutical production, along with its medical device expertise, gives it a major advantage in developing combination devices. Many of these companies bring together more traditional skillsets like plastic moulding and tool making with newer skillsets involving nanotechnology or biopharmaceutical production. Ireland's manufacturing history as well as its investment in highly automated and complex manufacturing technologies provides the range of skills required to produce these devices.

Telehealth

The demand for telehealth technology is expected to increase significantly, driven by the critical need for social distancing between doctors and patients as the pandemic of COVID-19 continues to interrupt the practice of medicine and worldwide treatment delivery. According to the Irish Government's Focus on Medical Technologies report in 2020, the need for patients to visit healthcare facilities will be minimised by telehealth, creating possibilities for the advancement of telehealth products and services, including sensors and remote diagnostic devices, realistic artificial intelligence and robotics systems, cybersecurity and privacy solutions. eHealth Ireland estimates that there are 179 Digital Health companies with over 2,300 employees in Ireland, which includes Medtech MNC.

Diagnostics

Pre COVID-19, In Vitro Diagnostics (IVD) was the largest market component with 13.4% share, so it has been one of the fastest growing subsectors in the Medical Device industry. Real time diagnostics, the development of personalised medicine, reduced costs and the expansion of healthcare in developing countries is driving this growth. Ireland has extensive experience in this sector with Abbott Diagnostics, Covidien, Alere, Roche, Beckman Coulter, Siemens Healthcare, and many others, engaged in either production or research operations in Ireland.



Connected Health

Another significant development in this sector is the growth of ‘connected health’ which is the use of information technology to provide better healthcare. It incorporates mobile technology, advanced sensors, remote monitoring tools and networked devices to better

monitor patients’ health. It allows for a vastly improved system for gathering and sharing medical information. Ireland is superbly positioned to take advantage of this rapidly developing field due to our strong medical device and ICT sectors. BiancaMed, Helix Health, Intel Digital Health Group, Slainte Healthcare and Valentia Technologies are just a few of the connected health companies in Ireland. These companies are supported by connected health research centres, such as the Applied Research for Connected Health (ARCH), the Biomedical Diagnostics Institute (BDI) and INSIGHT, which provide opportunities for collaborative research. The government has committed to providing funding support for the Connected Health sector, and it has received considerable investment over the last few years.

Sustainability in Ireland

In relation to sustainable approaches in our Manufacturing sector, Engineers Ireland says in its recently published State of Ireland report 2020 - Engineering a green and digital recovery: *“To remain globally competitive, Irish manufacturing needs to develop a strong strategy to introduce sustainability... in a coordinated way while focusing on increased competitiveness and revenues. New developments, innovations and trends in ICT and Digital Technology are disrupting the manufacturing processes and products and forming core foundations of sustainable manufacturing... Sustainable manufacturing*

is also enabled by a wide range of emerging technologies. Additive Manufacturing, collaborative robotics, advanced sensing systems, advanced automatic and autonomous systems, machine to machine communication, artificial intelligence, and big data are a few important and rapidly developing areas to mention. The integration of these technologies enables the formation of truly disruptive technologies that are sustainable and can be used throughout the Manufacturing industry value chain.”

Shared Service Activity: Quality, Regulatory Affairs and Third-Party Manufacturing

Ireland has an excellent track record for regulatory compliance and is experienced in dealing with the FDA and other regulatory bodies. The Medical Device industry is facing ever stricter quality and regulatory oversight and is therefore in need of greater numbers of personnel to fill these industry requirements. The new MDR legislation was due to be fully implemented in May 2020. However, due to COVID-19 this has now been postponed until May 2021. There has been a strong demand for experienced QA and Regulatory Affairs professionals over the last number of years in particular, as greater emphasis is placed on the safety and effectiveness of increasingly complex medical technologies.

Many medical device companies have shared services operations in Ireland, including Abbott (Alere), Teleflex and Baxter. They tend to cluster around Dublin but can be found in many regional locations. Often these companies will have a manufacturing or research facility in the country as well. Shared services operations provide opportunities for professionals with a wide range of skills. These centres can contain several functions, from accounting and finance, to multilingual customer and technical support centres, supply chain management, HR services and legal services. Ireland is ideally suited for this type of activity as it has an excellent supply of talent to fill these roles and has accumulated an abundance of experience in this area over the previous decades. Ireland’s quality and regulatory expertise, in addition to its shared service experience, has brought investment in third party manufacturing activities. Many international third party manufacturing operations are also managed from Ireland.



R&D in Ireland

Irish medtech start-ups have raised more than €178m in finance over the past two years, bringing medical technologies to the market and to patients. Research indicates that of the 450 companies based here, over 60% are indigenous, with a significant proportion of these being small and medium enterprises (SMEs).

The Medical Device industry is the number one industry for innovation globally, with 8% of sales being invested in R&D and a new patent filed every 50 minutes. The innovation cycle is incredibly fast, taking just 18-24 months. This means that a new product will be superseded by an improved version in less than two years. The funding of research will therefore play an important role in the continued development of the medtech industry in Ireland.

Research funding has increased markedly in the last number of years, with the Irish government committing to investing over €5 billion in science and technology research annually up to 2020, and several new research centres being established. Key priority areas for R&D include combination devices, personalised orthopaedics, drug eluting balloons, stents and connected health. Institutes such as the National Centre for Biomedical Engineering Science, the Network of Excellence for Functional Biomaterials, the Centre for Research in Medical Devices (CURAM) and the Regenerative Medicine Institute (REMEDI) have made NUI Galway a European hub for medtech research. CURAM's research concentrates on the development of 'smart,' implantable medical devices, it has over 40 industry partners. Industry collaboration has been a key feature of this new research environment.

REMEDI is combining stem cell and gene therapy technologies to assist in tissue repair. It is partnered with Creganna, ENBIO, Ovagen, and Medtronic, among others. The Advanced Materials and BioEngineering Research (AMBER) Centre recently launched an additive

manufacturing laboratory and partners with 11 medical technology companies as part of its overall research efforts. Research centres specialising in nanotechnology (CCAN, CRANN); in ICT and data analytics (Tyndall, INSIGHT); and material science (MSSI in Limerick, the National Polymer Centre in Athlone IT, and SEAM in Waterford IT); are applying their expertise to the medtech sector. They are all partnered with major domestic and multinational companies. Substantial resources have been invested in Irish research institutes in recent years and this has greatly benefitted the work of medical devices companies operating in the country.



Conclusion

A positive outlook is that the Medical Device industry in Ireland is investing more of its resources in high value manufacturing and R&D to maintain its leading position in the industry which will in turn lead to organisations requiring better qualified, and more highly skilled employees.

The increase in STEM graduates will provide the talent needed to support this transition and the creation of new apprenticeships will provide a technical base to drive the industry forward.

The industry in Europe is growing steadily at about 4% annually so taking this into consideration the outlook for the Medical Device industry, both globally and in Ireland, is extremely positive.

The ageing of developed country populations, the growth of emerging markets, and technological developments, are all opening new opportunities and expanding the size of the market. Ireland is already an important producer of medical devices and is well positioned to expand on this success.

The sector in Ireland looks very positive over the next number of years as this sector has the capability to expand and present excellent future career opportunities for qualified professionals.

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