

Medical Device Sector Shows Strong Growth

Israel's innovative medical devices reflect the country's inter-disciplinary capabilities

Israel's medical devices sector continues to attract major investment from global healthcare giants, as well as through public offerings in Israel and abroad, and through venture capital funds. In the past few years, five Israeli medical devices firms have been acquired by large international healthcare companies for more than \$1.4 billion dollars. Johnson & Johnson acquired Omrix Biopharmaceutical, a provider of bio-surgery and passive immunotherapy products, for \$438 million. Medical device and services company St. Jude Medical acquired MediGuide, a firm focused on inter-body navigation and minimally invasive cardiology, for \$300 million, while Medtronic acquired heart valve developer Ventor Technologies for \$325 million. Medingo, which develops a miniature insulin dispensing patch for diabetic patients, was acquired by Roche for \$200 million including milestone payments for ongoing development. Most recently

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Align Technologies acquired Cadent Holdings, which develops 3D scanning solutions for restorative dentistry and orthodontics, including intra-oral scanners, for \$190 million.

IPOs and VC Fund Raising

Other Israeli medical device companies have raised funds through public offerings and venture capital funds. D Medical (Nasdaq: DMED; TASE: DMDC), which develops a range of treatments and drug delivery devices for diabetes, recently raised \$20 million from US equity fund Yorkville after raising \$12 million on Nasdaq last August.

Glycominds (TASE: GLCM), which develops molecular diagnostic blood tests for personalized treatments for multiple sclerosis and Crohn's Disease, raised \$6 million on the TASE in February and has raised a total of \$37 million since its establishment, while mesh coated stent developer InspireMD raised \$9.7 million,

at a company value of \$100 million on the bulletin board of the stock exchange in New York in April.

Other typical recent examples include IceCure (TASE: ICCM, which raised \$11 million to develop its minimally invasive procedures to remove tumors using cryoablation, and EarlySense, which has raised \$31 million from VC funds for its early warning system monitoring patients who are not in intensive care, and STC Research & Development, which raised \$10.5 million from VC funds for its embolic protection device, which is a filter to protect the brain from clots during minimally invasive procedures.

Israel has by far the highest proportion of any country of new patents in this sector per head of the population. Over 400 companies in this field in Israel, about half of the country's Life Sciences sector, encompass a diverse range of medical disciplines including therapeutics, diagnostics, implantables, disposables, monitoring, telemedicine, imaging and medical equipment.

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Inter-Disciplinary Capabilities

Israel's strength in this sector stems from inter-disciplinary capabilities, which bring together medicine, clinical expertise, materials science, electronics, software expertise and engineering know-how. Some of the world's leading universities with renowned R&D faculties, leading edge medical centers, the world's highest per-capita number of physicians, and a flourishing high-tech sector combined with a spirit of entrepreneurship have all contributed to the country's dynamic growth in medical devices.

When compared to non-medical high tech, investments in the life science sector is at times costlier and a longer process before reaping financial

rewards. However, it is a more stable investment avenue as demographic and economic trends ensure the sustained interest and need for new technologies and therapies.

Israel's best known medical devices company is Given Imaging (Nasdaq: GIVN; TASE: GIVN), which is redefining the field of gastrointestinal (GI) diagnosis by developing, producing and marketing innovative, patient-friendly products for detecting GI disorders. Given Imaging, which has pioneered capsule endoscopy (a camera in a pill) and today offers a range of video capsules and related products, saw sales rise 11% to \$157.8 million in 2010.

Holding and investment group Elron Electronics, which owns 23% of Given Imaging, has a strong medical device portfolio that included a 50% stake in Medingo (prior to its acquisition in 2010). Also in Elron's portfolio: BrainsGate (28%), develops electrical stimulation based therapies for central nervous systems diseases; Pocared (23%) develops an innovative laboratory system for real time diagnostics; Impliant (22%) develops spinal implants for motion preservation as an alternative to spinal fusion; and NuLens (34%) develops implantable lens for providing clear vision at all distances. Elron recently sold its 21% stake in Galil Medical, which develops minimally invasive cryotherapy solutions for treatment of tumors.

According to the website of the Israel Life Sciences Industries (ILSI) – www.ilsilife.org.il - by far the largest sub-sector in medical devices, which represent 53% of all biomedical companies, is therapeutics (41% of companies) including both disposable and implantable devices. Diagnostics comprises

14%, medical equipment 10%, imaging 9%, monitoring 6% and drug delivery 4%.

These medical device companies cover the full range of medical disciplines. But Israeli firms are especially strong in the cardiovascular arena, followed by other disciplines such as ophthalmology, orthopedics, ob/gyn and oncology.

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Diagnostic Imaging

Israel's medical device sector evolved from the country's highly successful medical equipment industry, which was pioneered in the 1980's and 1990's by Elbit, which developed diagnostic imaging technology including innovative nuclear and magnetic resonance imaging and ultra-sound equipment. Elbit eventually sold its diagnostic medical imaging using computer tomography to General Electrics Marconi division, which in its turn was acquired by Philips Medical Systems. Based near Haifa, Philips Medical Systems has annual sales of about \$350 million. Similarly, Elbit's diagnostic ultrasound and nuclear and magnetic resonance imaging were sold to GE Medical Care, which today generates annual sales of \$395 million in Israel.

Elbit and GE Medical Care's partnership has spawned one of the country's most promising medical device firms – InSightec. Established in 1999 by Elbit and General Electric, ExAblate 2000, InSightec's first product, is FDA approved, and integrates focused ultrasound thermal ablation with magnetic resonance imaging capabilities to provide a non-invasive method for destroying or ablating targeted tumor tissues. InSightec is controlled (69%) by Elbit Medical Technologies (TASE: EMTC).

Another veteran Israeli medical device company is Lumenis, initially established in 1991 as ESC Medical Systems and formed several years later following a merger with Coherent Medical Group. Lumenis develops, manufactures, and markets state-of-the-art proprietary laser and intense pulsed light devices for dermatology and aesthetics. Lumenis had sales of more than \$237.7 million in 2010.

Other Multi-National Acquisitions

Johnson & Johnson's acquisition of Omrix was by no means its first major investment in Israel. The US giant had previously acquired Biosense through its Cordis Division. Biosense provides solutions

for endocardial diagnosis and therapy. Johnson & Johnson has also invested in Contec Medical, which develops multimedia information solutions for point of care applications and NESS (Neuromuscular Electrical Stimulation Systems), which provides technological solutions for patients suffering from paralysis due to neurological disorders. The company has also made an investment in Impulse Dynamics-

a developer of an active implant to treat chronic heart failure. Johnson & Johnson also partly owns Medigus (TASE: MDGS), a pioneer developer of a unique proprietary endoscopic device for the treatment of gastroesophageal reflux disease.

Medigus recently reported the development of the world's smallest miniature video camera, which it developed together with Tower Semiconductors. The camera is only 0.99 millimeters in diameter. The low-cost image sensor combines high sensitivity and resolution with dynamic versatility for a range of

potential medical applications, including cardiology, bronchoscopy, gastroenterology, gynecology, and orthopedic and robotic surgery.

Boston Scientific recently acquired SI Therapies, which develops cardiology products, for \$24 million, and has previously acquired: Mel – Medical Enterprises Group, which develops minimally invasive therapies for the treatment of cancer with a flagship product that induces remission and reduces recurrences of cancer of the bladder; Remon Medical which uses wireless communications to exchange energy and data with minute devices placed deep inside the body. Boston Scientific has also invested in Sightline, which specializes in the design and development of medical endoscopic systems. In addition, Boston Scientific invested in BrainsGate that is developing an implantable neuromodulator to treat brain tumors and other neurological disorders and in VisionCare Ophthalmic that has developed an implantable telescope to treat the dry form of Age Related Macular Degeneration.

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Guidant Technologies acquired X-Technologies for about \$150 million. X-Technologies, which developed a pull wire for use with catheters in balloon angioplasty, which effectively treats artery narrowing. Kodak Health acquired Orex Computed Radiography. Orex is developing, manufacturing and marketing low cost computerized radiography products, based on innovative phosphor plates. The technology captures X-ray images digitally, eliminating the need for film development processing.

Other companies traded on overseas stock markets in addition to Given Imaging include Card Guard (SWX: CARDG), traded on the Swiss Stock Exchange, which has developed advanced telemedicine software and monitoring equipment for high-risk and chronically ill patients, and Oridion Medical (SWX: ORIDN), also traded on the Swiss Stock Exchange, develops and manufactures breath-test analyzers, which can detect cancers and ulcers.

Companies traded on the TASE include: LifeWave (TASE: LIFE), which develops devices using electrical stimulation to treat chronic sores; MCS Medical Compression Systems (TASE: MDCL), which develops non-invasive compression systems to prevent blood clots in the limbs during surgery; Exalenz Bioscience (TASE: EXEN) which has developed an advanced breath-testing platform that enables the detection of the Helicobacter pylori bacteria and is in clinical trials for a variety of liver indications; Mazor Robotics (TASE: MZOR) which develops and manufactures surgical robotic devices; and Itamar Medical (TASE: ITMR) which develops non-invasive devices for procedures related to cardiovascular and autonomic nervous systems. Sialo Technology (TASE: SALO) has developed root canal and dental implant products.

Other Leading Companies

Other leading medical device companies include: Brainsway (TASE: BRIN) which develops and markets

Deep TMS (Transcranial Magnetic Stimulation) systems for treatment of a wide range of neurological and psychopathological disorders. Brainsway plans raising \$30 million on Nasdaq.

OrSense has obtained EU CE Mark certification to market its non-invasive continuous monitoring solution of hemoglobin and oxygen saturation to hospitals. Deep Breeze has received FDA approval to market its lung imaging system in the US and Biocontrol is developing implantable devices for the treatment of autonomic disorders, in which the nervous system ceases to function properly.

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Promising Start-Ups

Moshe (Mori) Arkin and Dr. Uri Geiger recently founded a seed-stage investment fund called Accelmed to invest in promising medical device

companies. Accelmed's start-up portfolio includes EDGE Medical Devices which is developing Plasma DR flat-panel X-ray detector technology for digital radiography, Non-Linear Technologies (NLT) NLT, which is developing minimally invasive surgical (MIS) products for treating degenerative spinal conditions and Peer-Medical, which is developing the first 330-degree colonoscopy.

Other start-ups include Pneumedicare which is developing a monitor for lung ventilation in mechanically ventilated patients, Nephera, which is developing an instrument based on electrical stimulation of the urinary bladder to break the vicious cycle of cardio-renal interaction, and SuperDimension, which is developing a lung navigation system.

New Funds Promise Future Investment

Clal Biotechnology Industries (CBI) (TASE:CBI) recently announced it is setting up a \$250 million medical devices investment fund, while some of the \$203 million VC fund established by the government, and managed by Orbimed Advisors is likely to be invested in medical device start-ups.