The History of ESD: GI Endoscopy

1950

Development of the World's First Practical Gastrocamera

In 1949, with the request of Dr. Tatsuro Uji (Department of Surgery, the University of Tokyo Hospital Koishikawa Branch) that he "somehow wants to cure the stomach cancer that afflicts so many Japanese people," the Olympus technical team began development of a gastrocamera. After developing numerous essential technologies such as a miniature lamp to illuminate the inside of the stomach, a wide-angle lens to capture a large field of view, a device for winding the film, and choosing materials to construct the flexible tube used to inserted the miniature camera into the patient, they succeeded in developing a prototype in 1950 and commercialized and launched it two years later in 1952. They continued their aggressive work with doctors to improve the device, and, in turn, physicians worked on rapidly developing techniques for diagnosing ailments of the digestive organs.

1964

Introduction of the Fiberscope

However, there was a problem with the gastrocamera. Unlike the gastroscope, it could not view the inside of the stomach directly, in real time. The device blindly took photographs of the stomach's interior and the film had to be processed before the doctor could see what the gastrocamera saw. What solved this problem was the development of the fiberscope, introduced in 1957.

In 1964, with a gastrocamera already able to take sharp photographs of the stomach, Olympus released a gastrocamera with a fiberscope attached. This combined instrument allowed the doctor to both observe the stomach in real time and to take high-quality photographs for documentation. Olympus' reputation in the medical field grew. A fiberscope is made up of tens of thousands of optical fibers; each fiber with a diameter of 8 microns, a width approximately 1/10th of a human hair. As the image is transmitted optically, the endoscope itself can bend. Since doctors were now able to directly see inside the patient's body, techniques necessary for examination became easier, and the fiberscope's popularity quickly spread. The diagnostic area also expanded to the esophagus, duodenum, large intestine, bronchial tubes, and bile ducts. Furthermore, the real-time image of the fiberscope allowed medical treatment to be performed through endoscopes, which was a tremendous advantage. By inserting devices through a instrument channel and performing surgery on a tumor while looking inside the body in real time, minimally invasive procedures became possible, and reducing doctors' reliance on surgical scalpels.

1983

Introduction of Endoscopic Ultrasound System

1985

Introduction of EVIS 1 Endoscopic Video System

In 1983, the videoscope was initially introduced in the U.S. While this first instrument was ground-breaking, Olympus' own initial offering, released in 1985, was seen as a significant improvement. A videoscope has an imaging element such as a charge coupled device (CCD) built into its distal tip. The image captured by this sensor is converted to a video signal and is then displayed on a monitor for all in the room to see. This allowed multiple doctors and healthcare professionals to observe simultaneously, and diagnostic accuracy increased rapidly. Following the introduction of videoscopes, there continued to be numerous technological advances, such as high-definition imaging, Narrow Band Imaging (NBI) and much more. Videoscopes have dramatically increased the endoscope's diagnostic and therapeutic potential.

2002

Introduction of EVIS LUCERA—the World's First High-Definition Endoscopic Video System

In 2002, Olympus developed the world's first high-definition endoscopic video system. By combining advanced imaging technologies, it became possible to provide improved image accuracy capable of detecting even the smallest of lesions. The system was equipped with more advanced image processing technologies, including the index of hemoglobin (IHb) color enhancement function that highlights slight changes in mucous membrane color—the IHb pseudo-color display function that makes lesions that are normally difficult to see during observation clearly visible—and an electronic magnification function for video and still images.

2020

Introduction of EVIS X1 Endoscopy System

In 2020, Olympus launched the EVIS X1 endoscopy system. As of February 2024, the system is marketed in Japan, U.S., Europe, China, and parts of Asia. Our most advanced endoscopy system to date, EVIS X1 has undergone a model change from the previous models for the first time in about eight years. Aiming to improve the quality of endoscopic procedure in the detection, characterization, staging, and treatment of irregular lesions, as well as examination efficiency by endoscopy, the EVIS X1 system contributes to early detection, early diagnosis, and minimally invasive treatment of gastrointestinal diseases such as cancer by being equipped with a variety of new technologies.

■The History of Gastrointestinal Endoscopy

Roots in Ancient Greece

"I want to view the inside of a human. I want to unravel the mysteries of life." Since ancient times, there has been a quest to find a way to observe the inside of the human body. It began with Hippocrates, the father of medicine, and ancient Greece in the 4th Century BCE. Horses were important for transportation back then and many people developed hemorrhoids from riding. By using a device, said to be the first endoscope, to observe the interior of the anus, the hemorrhoids were able to be healed through burning. Many centuries later, modern endoscopes began with the "Light Conductor," made in 1805 by the German physician Philipp Bozzini. It looked like a lantern and by inserting a metal tube into the urethra, rectum, or pharynx, the light would help with observations.

Named the "Endoscope" in France

In 1853, the French physician, A.J. Desormeaux, created a device for observing the urethra and bladder. This was the first time the term "endoscope" was used.

Examinations with Street Performers

The first person in the world to successfully observe the stomach was the German physician, Adolph Kussmaul. In 1868, expanding on Desormeaux's endoscope, he fashioned a metal pipe with a length of 47cm and a diameter of 13mm in his medical equipment shop, and performed an examination on a sword-swallower. However, the lamp produced an insufficient amount of light, and he could not adequately illuminate the inside of the body. Therefore, there was no practical endoscope until the introduction of electric lighting. In 1879, the Germany physician, Maximilian Nitze, and the Austrian electrical engineer, Joseph Leiter, made a cystoscope using an electric light as the source. They then went on to construct an esophagoscope and a gastroscope. In 1881, the Polish physician, Jan Mikulicz-Radecki, with the help of Leiter, created a rigid gastroscope where the first third of the tip was curved.

The First Practical Gastroscope

The first practical gastroscope appeared in 1932. It was the flexible gastroscope developed by German physician, Rudolf Schindler. It had a length of 75cm, a diameter of 11mm, and a third of the tip was curved slightly. However, since this endoscope was essentially a metal tube that was inserted into the body, the procedure was painful for the patient, and there was a possibility of accidents, such as perforation of the GI tract. Prior to WWII, their use was limited only to parts of Europe and Japan.

The Idea of the Gastrocamera

However, the idea of a stomach camera that has an ultra-small camera attached to the tip of a flexible tube and which could take pictures inside the digestive tract emerged in Europe and the U.S. at the end of the 19th century. In 1898, the developments of two German physicians, Fritz Lange and Carl Meltzing, were presented, but as the images obtained were blurry, they proved to be impractical.

1950 OLYMPUS

Development of the World's First Practical Gastrocamera

(See above for the rest of our Company's history.)

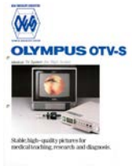
The History of ESD: Surgical Endoscopy

1975

Launch of Laparoscope

In the area of surgical endoscopy, Olympus began selling laparoscopes from the German rigid scope manufacturer, Winter & Ibe GmbH (W&I, later OWI), in 1975. At that time, laparoscopes were used in gynecology for purposes such as sterilization, and in internal medicine for procedures that included observing the surface of the liver and collecting tissue for the diagnosis of liver diseases.

1986



Olympus' First Medical TV System for Surgery Launched

After that, there was a growing need to attach a video camera to a rigid endoscope and for its images to be observed on a monitor. Therefore, Olympus began developing a TV system as an imaging device for surgery.

In 1986, Olympus developed and launched its first medical TV system, the OTV-S, for use with rigid endoscopes for surgical applications. Subsequently, Olympus undertook development of many products, and their imaging equipment significantly supported the advance and widespread adoption of rigid endoscope examinations using a monitor during surgery.

1996

Video Systems to Meet Diverse Needs

In operating rooms, a wide variety of dedicated endoscope designs were available to meet the needs of each medical specialty. In 1996, Olympus introduced the OTV-S5 video system, an Olympus Endoscopy System (OES) allowing multiple types of camera heads and videoscopes to be connected for various needs. The OTV-S5 served as a surgical imaging system, rather than just a video camera attached to a rigid scope. In 1999, Olympus also introduced the OTV-S6 video system that included a lineup of camera heads, which could withstand the autoclave (high-pressure steam) used to sterilize many instruments in operating rooms.

2015

Launched VISERA 4K UHD Surgical Endoscopy System Incorporating 4K Technology

Sony Olympus Medical Solutions was established in 2013 as a joint venture with Sony. The joint venture launched its first product in 2015, a surgical endoscope system incorporating 4K technology that provided surgeons with added value during endoscopic procedures through the use of high-resolution images, a wide color range and a wide field of view.

2021

Expanding Fluorescence Imaging Market Portfolio

In 2021, Olympus made the Dutch medical equipment manufacturer, Quest Photonic Devices B.V., a wholly owned subsidiary.

Olympus thereby acquired fluorescence imaging technology that makes the blood vessels under surface tissue visible by combining near-infrared light and fluorescent dyes, so that the fluorescent agents flowing in the bloodstream shine. We look forward to expanding our portfolio in the rapidly expanding fluorescence imaging market and researching and developing next-generation molecular imaging technologies.

2022

Launched VISERA ELITE III Surgical Endoscopy System

In 2022, Olympus launched VISERA ELITE III that offers surgical visualization features including 4K, 3D, infrared (IR) imaging, all supported in one system. Future software upgrades will advance surgical imaging technology and allow for individual configurations that facilitate seamless support of various surgical applications. VISERA ELITE III features Sony's cutting-edge digital imaging technology enhanced by leading endoscope manufacturer Olympus' expertise in manufacturing medical equipment and understanding the need of medical facilities. Sony Olympus Medical Solutions has leveraged these capabilities to develop the system's essential technologies and to optimize medical device image processing.

The History of Endoscopic Surgery

1975 OLYMPUS

Roots in Pulmonary Tuberculosis Treatment

The history of endoscopic surgery goes back to 1910, when thoracoscopes were used in the treatment of pulmonary tuberculosis. In the 1960s, endoscopes were being used in the areas of urology and gynecology in Europe. They became a common way to treat urinary stones.

Launch of Laparoscope

(See above for the rest of our Company's history.)

Beginning of Endoscoptic Surgery

In 1978, the German surgeon, Kurt Semm, developed an automatic insufflator. The first known endoscopic surgery was an appendectomy performed by Kurt Semm in 1981. It was the first attempt to greatly change laparoscopy, from the traditional approach through an orifice to an approach using an incision into the body. In 1985, the German surgeon, Erich Mühe, performed an endoscopic gallbladder removal.

The Accomplishments of Mouret

However, the man who was instrumental in the spread of endoscopic surgery was the French surgeon, Philippe Mouret. In 1987, he performed a gallbladder removal by attaching a CCD camera to the laparoscope and projecting the resulting video image on a TV monitor. He established the current style of laparoscopic surgery where the surgery is performed cooperatively in the view of doctors, assistants, and engineers. The first endoscopic gallbladder removal in Japan was performed in 1990 by Professor Tatsuro Yamakawa of Teikyo University. Starting in 1991, endoscopes were being used to resect the stomach for the treatment of stomach cancer. Since the early 1990s there have been many technological advancements in addition to the accelerated clinical use of endoscopic surgery. As stated previously, a key development was the coupling of endoscopes to external CCD cameras. The ability to view the operation on a video monitor allowed for a high level of cooperation between doctors and their assistants. The development of devices and equipment for surgery in body cavities that cannot be reached directly by hand progressed rapidly.

Health Insurance Coverage Starts in 1992

In Japan, starting in 1992 with gallbladder removal, endoscopic surgery is rapidly becoming covered by health insurance. Hernioplasty, lung resection, and gynecological surgeries were covered by health insurance starting in 1994, stomach resection in 1995, and 18 surgeries including splenectomy and liver removal in 1996.

Activities aimed at spreading endoscopic surgery are also popular in Japan. The Society for Endoscopic Surgery was started in 1990, and the Japan Society for Endoscopic Surgery (JSES) was established in 1995. The goals of these societies include both research and education. As of July 2008, membership was over 10,000. These societies foster increased awareness of endoscopic surgery through various conferences and publications, and certify technical competence in these new procedures through their physician certification programs.

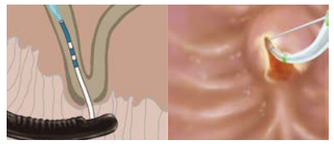
The History of TSD: GI EndoTherapy

1966

Launched Olympus' First Biopsy Scope and Endotherapy Devices (Biopsy Forceps/Cytology Brushes)

In 1966, Olympus introduced a biopsy fiberscope with an instrument channel to pass endotherapy devices through the endoscope's insertion tube. Along with conventional endoscopic image diagnoses, it became possible to take a sample of tissue using biopsy forceps to then be examined by a pathologist under a microscope. Endoscopic biopsy greatly streamlined early-stage stomach cancer diagnosis. Subsequently, endotherapy devices were developed separately from those for treatment and therapy. By 1968, academic conferences were presented cases of excising stomach polyps using a snare (wire loop), and using biopsy forceps through which a high-frequency electric current passed.

1970



ERCP EST

Major Developments in Biliary Tract and Pancreas Fields

In 1970, Olympus launched the duodenofiberscope, and there was great progress made in diagnosis and treatment in the biliary tract and pancreas fields. By using a cannula while projecting X-rays of the biliary tract and pancreas, physicians developed techniques including endoscopic retrograde cholangio pancreatography (ERCP) to detect tumors and other lesions, and endoscopic sphincterotomy (EST) to widen the opening of the duodenal papilla with a high-frequency scalpel.

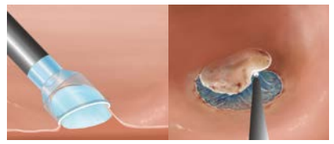
1975

Clip hemostasis

Contributions to New Hemostasis Techniques

In 1975, in response to the demand for less bleeding during endoscopic therapy and hemostasis with an endoscope, Olympus also launched an endotherapy device called a coagulator to cauterize and staunch sites of bleeding with a high-frequency electric current. In the same year, Olympus also launched an endoscopic clip that stops bleeding by directly grasping and pinching closed the site of bleeding. After that, improvements continued over the course of 10 years, and clipping became widely used for hemostasis and marking for resection.

1980s



EMRC ESD

Resects Wider Range of Lesions

In the 1980s, endoscopic mucosal resection (EMR) became practical following joint development by physicians and Olympus. This is a surgical procedure by which saline water is injected between lesioned tissue from early-stage stomach cancer or colon cancer and regular tissue to inflate the lesion, which is then removed by means of a snare. Following the development of devices, endoscopic submucosal dissection (ESD), which allows a wider range of early-stage lesions to be endoscopically removed, was introduced in 2002.

2002

Electrosurgical knife

Resects Mucosa in Entire Area around Lesions

In 2002, Olympus developed the electrosurgical knife, which reduced perforation risks by adhering a ceramic insulator to the tip of the needle-like knife. In 2008, the electrosurgical knife, which allowed adjusting the knife length based on the intended use was developed. These endotherapy devices have contributed to the development of safer procedures for resecting mucosa in the entire area around a lesion.

2020

Colonoscope distal attachment

Expanding Lineup of Device to Treat Gastrointestinal Disease

In 2020, Olympus expanded its lineup of gastrointestinal disease treatment devices by acquiring the British medical device manufacturer Arc Medical Design Ltd. Having been designed to help maintain and maximize visibility during a colonoscopy or endoscopic polypectomy, the company's flagship ENDOCUFF VISION product is expected to contribute to the early detection and treatment of adenomatous polyps.

The History of TSD: Urology

1972

Nephrofiberscope and rigid cystoscope

Launch of Nephrofiberscope and Development of Rigid Cystoscope

Diagnosis and treatment using rigid endoscopes has long been performed in the area of urology. With its origins in gastrocameras, Olympus was a newcomer to the area. In 1970, however, Olympus collaborated with the Department of Urology in the Faculty of Medicine at the University of Tokyo and developed a nephrofiberscope that allowed observation of the ureter and renal pelvis without surgical incision. The University of Tokyo was the first in the world to use this scope in clinical application.

In 1972, Olympus launched the KF nephrofiberscope designed for use in the kidneys while developing the CYS-K1 rigid cystoscope.

1979

Acquisition of German Rigid Endoscope Manufacturer

In 1979, Olympus made the German rigid endoscope manufacturer, Winter & Ibe GmbH (W&I), one of its subsidiaries and established the company as a manufacturing base for Olympus' rigid endoscopes. This move allowed Olympus to acquire a rigid endoscope lineup for the surgical market (including the mainstay urology market) and accelerate the expansion of its surgical business. By combining W&I's manufacturing technology with Olympus' optical technology, these new rigid endoscopes had improved optics and operability, as well as unprecedented system functionality and design.

1986

Cystofiberscope

Improvements of Fiberscope and Contribution to Minimally Invasive Treatments

In 1986, Olympus introduced the CYF cystofiberscope and strengthened its initiatives in urology. Unlike rigid endoscopes, the CYF's flexible insertion section contributed to alleviating patient discomfort during examinations, and the bending mechanism at the tip of the fiberscope made it possible to observe a wider area inside the bladder.

Progress in improving ureterofiberscopes included the pursuit of a thinner insertion section, improved optics, and improved insertability resulting from adjustments to the diameter of the instrument channel and the distal end design. Thereafter, they became essential for the observation and treatment of the ureter.

2005

Electrode for TURis procedures

Practical Application of the World's First Saline Prostatectomy

In 2005, physicians developed a new procedure called TURis (trans urethral resection in saline) for resecting enlarged prostate. Olympus developed the world's first endoscopic cutting loops for TURis and a high-frequency power device to control high-frequency currents for ablation. With TURis, the entire circumference of the electrode is made to discharge electricity and excision takes place through an electrolyte solution, which allows a more stable and higher level of cutting ability than before.

2008

Ureterovideoscope Gyrus energy device

From Flexible Ureteroscopes to Videoscopes—Strengthened sales force in North America

In 2008, flexible ureteroscopes evolved from fiberscopes to videoscopes.

In the same year, Olympus made the U.S. company Gyrus ACMI Inc. one of its subsidiaries. Gyrus ACMI had a long history and was well respected in the endoscopy area. It was particularly known for its expertise in urology and otorhinolaryngology, as well as energy application treatment devices centered on electric scalpels. The sales force in North America, the largest market, was strengthened and the market share was expanded.

2020

Minimally invasive treatment device for BPH Thulium fiber laser system

Introduction of Even Less Invasive Surgical Treatment Devices

In 2020, Olympus launched iTind, a minimally invasive treatment device for BPH, and the SOLTIVE SuperPulsed Laser System, a thulium fiber laser device for dusting urinary stones into very fine particles for easy discharge from the body. Both are treatment devices that contribute to reducing the burden placed on patients. By introducing these products, Olympus will provide physicians and patients with new options and further enhance its portfolio in the urology area.

The History of TSD: Respiratory

1968

Bronchofiberscope

Launch of Bronchofiberscope

In 1968, the bronchofiberscope for the respiratory area was launched. Having received high praise for its completed products, the quality of their fiber-optics, and the comprehensive lineup of scope types, Olympus bronchofiberscopes sold well worldwide. In particular, unlike other manufacturers, Olympus gave scope users the ability to select the most appropriate insertion section specification from diameters of 3mm, 4mm, or 5mm.

1993

Bronchovideoscope

Evolution from Fiberscope to Videoscope

After this, improvements were made, giving rise to many fiberscope models, from scopes with a large 3.2mm channel to scopes with an external diameter of just 1.8mm.

Then the bronchofiberscope evolved into the bronchovideoscope. In 1993, three bronchovideoscope models were launched, and since then, the use of videoscope technology has advanced even in the respiratory area, where slim design is required.

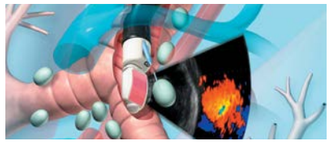
1997

TBNA

Review of Endoscopic Ultrasonography Procedures

Transbronchial needle aspiration (TBNA) is a method for diagnosing lung cancer by using aspiration biopsy from a lymph node on the extra-bronchial wall. The needle for this procedure is inserted through a bronchoscope. Conventionally, the tip of the needle could not be observed. In response to requests from physicians who wished to utilize an ultrasound endoscope for this procedure so that they could see the needle, Olympus began reviewing product specifications and developing prototypes around 1997.

2004



EBUS-TBNA system

Widespread Adoption of Endoscopic Ultrasound Procedures

After many reviews and the production of prototypes, in 2004, Olympus developed and launched an ultrasound bronchoscope, which enabled confirmation of the needle tip's location during TBNA, and a specialized aspiration needle. This led to the widespread adoption of endoscopic ultrasound TBNA and EBUS-TBNA (endobronchial ultrasound transbronchial needle aspiration) and contributed to the realization of a lymph node metastasis method that is minimally invasive and possesses advanced diagnostic capabilities.

2010

Intrabronchial valve system

Acquisition of Emphysema and Pneumothorax Treatment Devices

In addition to diagnosing lung cancer, Olympus also made full-scale efforts to expand applications for endoscopes for non-cancerous diseases. In 2010, Olympus made Spiration, Inc. a consolidated subsidiary. This U.S. company handles minimally invasive treatment devices for lung diseases, such as emphysema and pneumothorax, and lung injuries. Olympus would go on to accelerate the company's business by providing bronchoscopic devices (valves) as a minimally invasive treatment for lung diseases, which are on the rise.

The History of the Olympus Medical Business

Year	Main Accomplishments
1950	Development of world's first practical gastrocamera
1952	Above-mentioned gastrocamera commercialized, announced as GT-I
1955	Gastrocamera Research Group established
1964	GTF gastrocamera fiberscope released
	Established corporation in Europe
1966	GFB fiberscope for biopsy released
1968	Established corporation in U.S.
1974	Partnership with Winter & Ibe GmbH in Germany (entered into surgical endoscopy area the next year)
1979	Winter & Ibe GmbH became subsidiary
	Established U.S. location in California (currently the world's largest endoscope service center)
1982	Introduction of endoscopic ultrasound system
1985	EVIS 1 endoscopic video system announced
1987	KeyMed Ltd. (UK) became subsidiary
1989	Established Beijing residential office
	Established corporation in Singapore
1990	EVIS 100/200 series endoscopic video information system announced
1993	Established corporation in Russia
1999	Established corporation in Thailand
2000	Introduction of EVIS EXERA series endoscopic video system in Europe and North America
2001	Comprehensive partnership with Terumo Corporation for medical equipment started
2002	Introduction of VISERA series video system for endoscopic surgery
	EVIS LUCERA–the world's first high-definition endoscopic video system–released in Japan, the UK, and parts of Asia
	Established corporation in Brazil
2004	Established marketing/services company for medical equipment in China
	Celon AG (Germany) became subsidiary
2005	Small intestine capsule endoscopy system introduced in Europe (expanded afterward to North America, Japan, and other regions)
	Established center for repair of endoscopy products and management of loan units in Japanese market (Shirakawa, Fukushima Prefecture)
2006	Introduction of EVIS EXERA II and EVIS LUCERA SPECTRUM endoscopic video systems that include NBI
	Introduction of VISERA PRO surgical video endoscopy system
	Established service company in Vietnam (now also responsible for sales)
2006	Established repair center for endoscopic products in Chinese market
2008	Gyrus plc. (UK) became subsidiary
	Established new plant for the production of medical devices in Vietnam
	Established training centers in Germany and China (Shanghai)
2009	Established medical equipment marketing company in India
	Commenced operation at new factory in the Czech Republic
2010	Established training center in China (Beijing)
2011	Spirus Medical, Inc. (U.S.) became subsidiary
	Introduction of Surgical Imaging Platform VISERA ELITE
	Olympus' NBI Technology recognized by the Japan Institute of Invention and Innovation
2012	Introduction of EVIS EXERA III and EVIS LUCERA ELITE gastrointestinal endoscopy systems
	Introduction of THUNDERBEAT series of world-first composite electrosurgical devices that combine bipolar high-frequency current and ultrasonic energy
2013	Established Sony Olympus Medical Solutions Inc. (joint venture with Sony Corporation)
	Launched 3D surgical videoscope system (launched simultaneously with a 3D videoscope featuring a world-first tip bending function)
	Established training center in China (Guangzhou)
2015	Introduction of VISERA 4K UHD surgical endoscopy system incorporating 4K technology
2016	Established training center in Thailand
	Established corporation in Dubai
2017	Introduction of VISERA ELITE II surgical endoscope system
	Image Stream Medical, Inc. (U.S.) became subsidiary
2019	Established new global headquarters for Therapeutic Solutions Division in the U.S.
2020	Introduction of EVIS X1 gastrointestinal endoscopy system
	Acquisition of Arc Medical Design Ltd. (UK)
	Introduction of ENDO-AID AI-powered platform for the endoscopy system
2021	Acquisition of Quest Photonic Devices B.V. (Netherlands)
	Acquisition of Medi-Tate Ltd. (Israel)
2022	Introduction of VISERA ELITE III surgical visualization platform
	Acquisition of Odin Medical (Odin Vision) Ltd. (UK)

Blue items indicate the establishment of new locations and subsidiaries.

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