Main Diseases, Procedures, and Products

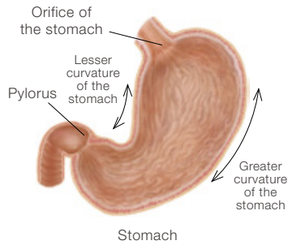
GI: Digestive Tract (Esophagus/Stomach/Large Intestine/Small Intestine)

Main diseases 1 Esophageal Cancer

The walls of the esophagus are made from multiple layers of mucosa and muscle. Cancer of the esophagus typically occurs in the innermost mucosa. This is called "squamous cell carcinoma" and over 90% of Japanese people with cancer of the esophagus have this type of cancer. Habitual drinking and smoking are sources of risk. There is another type of esophageal cancer called "adenocarcinoma" which is more common in Europe and the U.S. This type of cancer is found in 60-70% of esophageal cancer cases in Europe and the U.S. The primary cause of adenocarcinoma is a condition called Barrett's esophagus, where stomach acid flows up the esophagus and causes inflammation of the esophageal mucosa.

Main diseases 2 Stomach Cancer

It is thought to arise in the mucosas of the stomach from gastritis and atrophy. When atrophy occurs in the mucosas of the stomach, it leads to atrophic gastritis, which can lead to "intestinal metaplasia," a condition in which the stomach-type mucosa turns into intestinal-type mucosa. Intestinal metaplasia is known to develop into cancer. Recently it has been shown that this is related to the bacterium Helicobacter pylori. H. pylori causes inflammation of the mucosa in the stomach and has been observed to lead to atrophic gastritis and intestinal metaplasia.

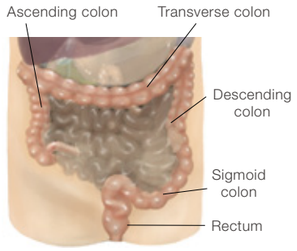


Stomach

Main diseases 3 Large Intestine Cancer

It is increasing in Japanese people as they are starting to eat a more Western diet. Cancer of the large intestine includes both colon cancer and rectal cancer, but colon cancer especially is increasing rapidly. Consuming animal fats causes greater secretion of biliary acid to help with digestion. There are carcinogens among the substances that develop when digesting fats. It is believed that cancer occurs in the mucosa of the large intestine.

The inside of the large intestine consists of four layers. Sometimes, benign polyps called adenomas occur in the mucosa. Many cases of colorectal cancer are believed to be related to these polyps. Furthermore, it has been recently discovered that there are also flat and depressed cancers that develop directly from the mucosa. The most common areas for colorectal cancer are the rectum and sigmoid colon, which cancers account for about 70% of all cases.



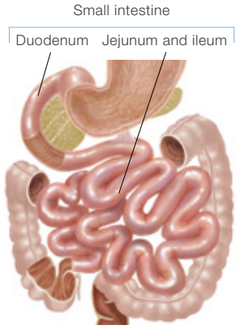
Large intestine

Main diseases 4 Colon Polyp

A tissue that protrudes from the mucous membrane of the colon is called a colon polyp. The polyp has a high probability of occurring in the rectum or the sigmoid colon, and its size is between a few millimeters and 3cm. They are largely divided into neoplastic and non-neoplastic polyps. Small polyps are generally asymptomatic, but if they become large, symptoms such as fecal occult blood and fresh blood in the stool can occur.

Main diseases 5 Small Intestinal Ulcer

An ulcer that appears in the small intestine. Frequency of occurrence is not high, with less than a 5% chance overall of becoming a gastrointestinal tumor, however, malignancy is high since two-thirds of all small intestinal ulcers are malignant tumors. These ulcers are mainly discovered when examining such symptoms as pain, bleeding, or stricture of the abdomen. Although early diagnosis is difficult, through the improvement of endoscope technology, such as capsule endoscopes and balloon endoscopes, which enable detailed examination of the small intestine, small intestinal tumors are being discovered with greater frequency.



Small intestine and surrounding organs

Main diseases 1 2
Main scopes used in ESD
Gastrointestinal Scope

Gastrointestinal videoscopes are for viewing the stomach and duodenum through the esophagus and usually have an insertion tube length of 1,030mm. Videoscopes have a forward-facing lens on the distal tip which is ideal for observing tissue directly in front of the endoscope. Videoscopes designed to be inserted through the mouth typically have an insertion tube diameter of around 10mm; videoscopes designed for passage through the nose are about half that diameter.


Gastrointestinal videoscope

Main diseases 3 4
Main scopes used in ESD
Colonoscope

Colonovideoscopes are longer than gastrointestinal videoscopes in order to accommodate the long 1.5m length of the adult large intestine. Standard-length colonovideoscopes are 1,330mm long. Extended length models are 1,680mm long. The colonovideoscope has a forward-facing tip. In order to facilitate insertability into the colon a flexibility adjustment ring allows the operator to adjust the stiffness of the insertion section during the procedure. Colonovideoscopes typically have an insertion tube diameter of around 13mm.


Colonovideoscope

Main diseases 5
Main scopes used in ESD
Small Intestinal Scope

This involves using an endoscope with a balloon attached on the distal end such that the inflated balloon holds the intestine open and allows the endoscope to be moved forward. Insertion can be via either the mouth or anus. As the instrument channel outlet is also provided, as on a conventional endoscope, it can be used for biopsies or to perform simple procedures. To be long enough to view the small intestine, the endoscope has a length of 2,000mm and a diameter of approximately 9mm.

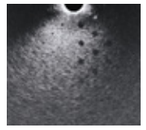

Small intestinal videoscope


Single balloon enteroscope

Ultrasound Gastrovideoscope

In addition to regular endoscopes, Olympus manufactures "ultrasound videoscopes" that allow combined endoscopic imaging and ultrasound imaging of the organ under inspection. They have an ultrasound transducer installed on their tip. By using medical ultrasound technology, lesions that cannot be seen from the surface and are located deep in the organ can be found. In the digestive tract, this kind of endoscope is used to find tumors and cancers hidden below the surface of the GI tract and to examine varices in the esophagus. They are also used to find cancer, gallstones and pancreatic stones in the pancreas and biliary tract. Biopsy needles inserted under ultrasound guidance can diagnose hidden submucosal tumors and diagnose and treat pancreatic cysts.


Ultrasound gastrovideoscope


Ultrasound image

ENDO-AID, an Endoscopy CAD*1 Platform Equipped with an AI-powered Diagnostic Support Application for Colonoscopies

When used in combination with the EVIS X1 gastrointestinal endoscopy system, ENDO-AID serves as a CAD platform that can automatically detect and display possible lesions such as polyps and cancer in real time. By adding AI-powered support, ENDO-AID makes colonoscopies easier for both physician and patient and aims to improve overall clinical results regardless of the doctor's experience. Equipped with ENDO-AID CADe*2, a detection support application for lesions in the large intestine.

ENDO-AID

ENDOCUFF VISION™, Colonoscope Distal Attachment

This device is attached to the colonoscope's distal end to support visualization in procedures such as colonoscopy screening and polyp removal. ENDOCUFF VISION™ features a proprietary design comprised of a flexible arm with extensions placed on the device circumference. The arms open the colon's bended section and mucosal folds, providing a clearer view inside the colon and making it easier to detect polyps and adenomas. Research*3 shows that compared with standard colonoscopies, those performed using this technology increase the adenoma detection rate (ADR) by up to 11%. According to this research, each 1% improvement in the ADR lowers the risk of colon cancer by 3%.

ENDOCUFF VISION™

PowerSpiral, Small Intestine Endoscope System

A small intestine endoscope system that reaches the target site by pulling the small intestine over the device through motorized rotation. The system incorporates the world's first foot-switch-operated motor to rotate an overtube, which is equipped with spiral-shaped fins positioned on the endoscope. The PowerSpiral may improve scope maneuverability and shorten procedure times.

PowerSpiral

*1 Computer Aided Detection/Diagnosis: AI-powered diagnostic and detection support
*2 Computer Aided Detection: AI-powered detection support
*3 Williet, N., Tournier, Q., et al. Effect of Endocuff-assisted colonoscopy on adenoma detection rate: meat-analysis of randomized controlled trials. Endoscopy, 50 (9), 846-860. Doi:10.1055/a0577-3500. Available at: https://www.ncbi.nlm.nih.gov/pubmed/29698990

Diagnostic method
regarding main diseases 1 2 3 4 5

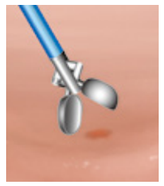
Biopsy

A biopsy is a diagnostic procedure that removes pieces of tissue which is suspected of being a lesion, subject to pathological testing under a microscope.

Main endotherapy devices used in TSD

Biopsy Forceps

Biopsy forceps include the standard type and also a type with a needle which prevents slipping on the surface of mucosa. Various biopsy forceps are used such as a single-side opening type for the esophagus and the wide-opening type used for stiff mucosa.



Biopsy

Biopsy forceps with needle

Diagnostic method
regarding main diseases 1 2 3 4 5

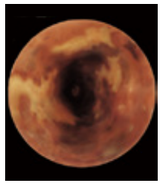
Dye Spraying

In order to identify tumors or other lesions in the early stages, dye, such as Indigo carmine solution and Lugol iodine solution, is sprayed on the surface of the mucosa. This procedure enables easier observation of mucosal surface shape change.

Main endotherapy devices used in TSD

Spraying Tube

An endotherapy device for spraying dye on an observation site.



Spraying Lugol into the esophagus (image)

Spraying tube

Method of treatment in internal medicine
regarding main diseases 4

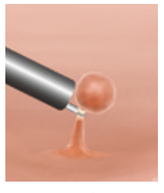
Polypectomy

A polypectomy is a procedure that removes local elevated lesions called polyps which grow out of the mucous epithelium. A wire snare is looped around the base of the polyp, and a high-frequency electrical current is applied while the snare is tightened. The polyp is then burned off and collected using gripping forceps. There is also a method called "cold polypectomy," in which polyps of less than 10mm are squeezed and removed without applying high-frequency current.

Main endotherapy devices used in TSD

Electrosurgical Snare

An electrosurgical snare is forceps made of looped metal wire. The therapeutic device applies a high-frequency current to ligate the lesion site and then burn off the lesion. Among high-frequency snares are ones that can carry out a cold polypectomy that severs the lesion without applying a high-frequency current.



Polypectomy

Electrosurgical snare

Method of treatment in internal medicine
regarding main diseases 4

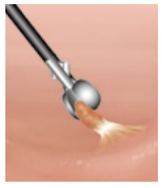
Hot Biopsy

For small polyps and relatively flat (sessile) polyps, a procedure called a biopsy can be performed. While pinching the polyp with a biopsy forceps, high-frequency current is used to remove the tissue and cauterize the polyp base, preventing bleeding from the site.

Main endotherapy devices used in TSD

Hot Biopsy Forceps

Hot biopsy forceps can collect tissue while applying a high-frequency current to a cup unit. The end section is about the same structure as a biopsy forceps. The operating section has a plug for connecting to an electrosurgical generator.



Hot biopsy

Hot biopsy forceps

Method of treatment in internal medicine
regarding main diseases 1 2 3 4

Endoscopic Mucosal Resection (EMR)

EMR enables the removal of small flat lesions such as early-stage cancers. There are several techniques for performing EMR. One of these is so-called "cap EMR" (EMRC). This procedure uses a transparent plastic cap fitted over the tip of the endoscope. The lesion is first raised by injecting normal saline into the submucosa under the lesion. The raised tissue is then sucked into the cap attached to the tip of the endoscope and is cut off using an electrosurgical snare positioned inside the cap. The lesion is then recovered using suction.

Main endotherapy devices used in TSD

Clear Cap

Equipped with a scope end-section, clear cap is used to remove a lesion by suction.

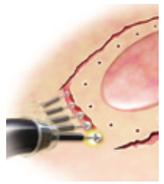
EMRC method

Clear cap

Method of treatment in internal medicine
regarding main diseases 1 2 3

Endoscopic Submucosal Dissection (ESD)

EMR is limited to removing lesions smaller than 2cm. ESD was developed as a procedure for removing much larger (and more irregularly shaped) lesions. First, an electrosurgical electrode is used to make small burn marks to outline the area around the lesion. The lesion is then raised by injecting normal saline into the submucosa to separate the lesion from the normal tissue below. Next, the mucosa around the lesion is cut using an electrosurgical knife. The submucosa is then separated, and the lesion is recovered using forceps.



ESD

Electrosurgical knife

Main endotherapy devices used in TSD

Electrosurgical Knife

A therapeutic device for removing larger early-stage lesions. There are knives with a ceramic insulator attached to the tip of the needle knife. The insulator lowers the risk of perforation in the digestive tract and also enables large-scale mucosa removal.

Method of treatment in internal medicine
regarding main diseases 1 2 3 4 5

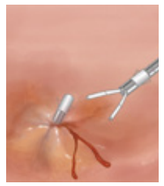
Hemostasis

A hemostasis procedure is sometimes required to control the bleeding that results from removing polyps and other lesions. There are several ways to stop bleeding using an endoscope.

Main endotherapy devices used in TSD

Clip

The clip acts to pinch the open blood vessel closed, and applies pressure to the tissue to stop the bleeding. In the clip hemostasis method, the clip tip is left in place after compression.



Clip hemostasis

High-frequency hemostatic forceps

Main endotherapy devices used in TSD

High-Frequency Hemostatic Forceps

Hemostatic forceps that use high-frequency securely grip large blood vessels or hard and slippery tissue, enabling coagulation to occur.

Method of surgical treatment
regarding main diseases 2

Laparoscopy-Assisted Distal Gastrectomy (LADG)

This surgery is limited in application to early-stage cancers from the lower part of the stomach (pyloric antrum) to the middle of the stomach (body of the stomach). The standard procedure is to remove at least two-thirds of the stomach and the lymph nodes around the stomach. The reason this is called a "laparoscopy-assisted" procedure is that the surgery requires a laparotomy, albeit with a smaller incision.

The two basic methods for reconstructing the stomach are the Billroth I method and the Roux-en-Y method. In the Billroth I method, the remaining stomach and the duodenum are joined. In the Roux-en-Y method, the remaining stomach and the jejunum are joined, and the remaining duodenum is connected to the bottom of the jejunum. Food flows from the stomach to the jejunum, where it mixes with digestive fluids that flow in from the duodenum.

If these surgeries are not appropriate for the patient, there is still another kind of stomach cancer surgery called Laparoscopy-Assisted Total Gastrectomy (LATG).

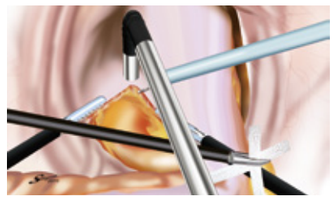
Billroth I method

Roux-en-Y method

Method of surgical treatment
regarding main diseases 3

Laparoscopy-Assisted Colectomy

Colorectal cancer surgeries target the large intestine, cecum, and rectum. As with stomach cancer, the goal of these surgeries is to remove the affected area as well as the associated lymph nodes. Compared to the stomach, the structure of arteries and veins supplying the colon is simple and the removal of associated lymph nodes is easy. Therefore, it is said that there is a high chance that laparoscopy-assisted colectomy may become the standard surgery for colorectal cancer in the near future.



Laparoscopy-assisted colectomy

Note: The above image of the procedure is from the case report by Dr. Arita of Kyoto Prefectural University of Medicine.

Main therapeutic devices used in TSD

Surgical Systems

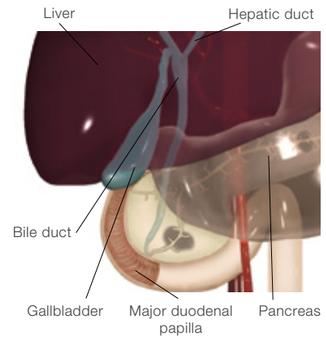
› Systems used in surgery are described on pages 36-37.

GI: Biliary Tract/Pancreas

Main diseases 1

Gallstones

A medical condition in which a stone can appear in the biliary tract (generic term for the bile duct, gallbladder, and major duodenal papilla). Gallstones that form in the gallbladder are particularly common. Biliary tract cancers, which can appear in the gallbladder and bile duct, are understood to be connected to gallstones. If gallstones injure the biliary tract, they can cause inflammation, which can turn into cancer if prolonged.



Main diseases 2

Pancreatic Cancer

It comes from pancreatic cells. Pancreatic cancer is divided into two types: exocrine (digestive enzyme secretion system) and endocrine (hormone secretion system). About 95% of pancreatic cancer is of the exocrine type, and about 85% of these are invasive pancreatic duct cancers that occur on the epithelium of the pancreatic duct. Pancreatic cancer typically occurs in individuals who are 50–70 years old, especially in elderly males.

Main diseases 1 2
Main scopes used in ESD

Duodenoscope

Unlike gastrointestinal videoscopes and colonovideoscopes, duodenovideoscopes have a side-viewing tip design in which the lens and illumination optics are on the side of the scope. This enables the scope to perform procedures such as Endoscopic Retrograde Cholangio Pancreatography (ERCP) that is imaging of the pancreaticobiliary ducts via the duodenum, and for performing Endoscopic Sphincterotomy which allows removal of gallstones via the mouth. This endoscope has a prism at its tip to allow it to look perpendicular to its axis, and a forceps elevator to deflect accessory devices in the same direction. Duodenovideoscopes typically are 1,240mm long.

Note: A single-use scope is planned for future release.

Duodenovideoscope

Side-viewing tip design (including forceps elevator system)

Main diseases 1 2
Main scopes used in ESD

Cholangioscope

Cholangiovideoscope is a miniature scope inserted in the instrument channel of a duodenovideoscope. It can be used for direct observation inside the narrow duct of the pancreaticobiliary system or to collect tissue.

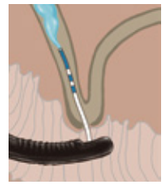
Note: A single-use scope is planned for future release.

Cholangiovideoscope

Diagnostic method
regarding main diseases 1 2

Endoscopic Retrograde Cholangio Pancreatography (ERCP)

ERCP is method for examining the biliary tract and pancreatic duct using a combination of endoscopic and radiographic techniques. Using an endoscope, a thin tube (cannula) is inserted through the papilla of Vater into a duct of the pancreaticobiliary system. Radiological contrast dye is then injected into the ducts, and the area is viewed using X-rays.



ERCP

Cannula

Main endotherapy devices used in TSD

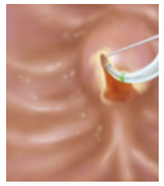
Cannula

A thin tube for injecting radiological contrast dye into the pancreatic or bile duct that can then be viewed by X-rays.

Method of treatment in internal medicine
regarding main diseases 1

Endoscopic Sphincterotomy

It is a procedure that is often used to remove gallstones. A papillotomy knife (papillotome) is inserted into the opening of the duodenal papilla, and the papillary sphincter is cut open. Following this, a stone extraction balloon or stone retrieval basket can be inserted into the biliary ducts to remove any gallstones residing in the biliary system.



Endoscopic Sphincterotomy

Papillotome

Main endotherapy devices used in TSD

Papillotome

An electrosurgical knife inserted into the papilla at the end of the bile duct for use in incision using high frequencies.

Main endotherapy devices used in TSD

Stone Extraction Balloon

A balloon-shaped catheter used to scrape out small stones resembling sand and silt.

Stone extraction balloon

Main endotherapy devices used in TSD

Stone Retrieval Basket

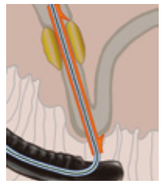
An endotherapy device that is used to help retrieve and remove stone fragments from the bile duct.

Stone retrieval basket

Method of treatment in internal medicine
regarding main diseases 1

Endoscopic Biliary Drainage (EBD)

If the free flow of bile to the duodenum is hindered due to gallstones or a stricture (narrowing) of the bile duct due to disease, EBD may be performed by inserting a plastic or metal stent into the duct to allow the free flow of bile.



EBD

Plastic stent

Main endotherapy devices used in TSD

Plastic Stent

When a bile duct has a stricture or blockage, this stent is inserted into the duct and releases bile. The device is implanted for a short period of time (around several weeks).

Main endotherapy devices used in TSD

Metal Stent

This stent is made of metal mesh. The post-implantation lumen is larger than for a plastic stent and can be expected to have large drainage. Comparatively long-term (several months) patency and detainment is possible.

Method of surgical treatment
regarding main diseases 1

Laparoscopic Cholecystectomy

This is the most common type of endoscopic surgery in Japan. The gallbladder is attached to the underside of the liver, and must be carefully removed using an electrosurgical knife and dissecting forceps. Next, the cystic artery and cystic duct are clamped with clips and cut to separate them from the liver. Finally, a trocar is inserted and the gallbladder removed from the body through the trocar using grasping forceps.

Detachment of gallbladder

Removal through incision

Main therapeutic devices used in TSD

Surgical Systems

› Systems used in surgery are described on pages 36-37.

Urology

Main diseases 1

Benign Prostate Hyperplasia (BPH)

A condition in which urination is obstructed by pressure placed on the urethra by an enlarged prostate, which is located under the bladder. Symptoms include a sensation of residual urine and more frequent trips to the toilet due to the reduced amount of urine passed at each urination.

Main diseases 2

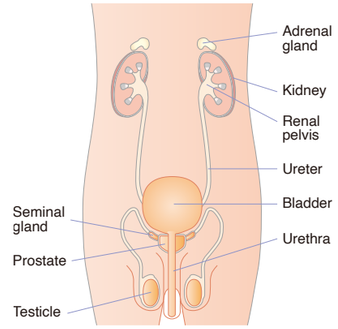
Urinary Stone

A condition in which substances contained in urine crystalize for some reason and coalesce in the form of a stone. Typical symptoms include extreme pain, bloody urine, or the presence of the stone in urine.

Main diseases 3

Bladder Tumor (Bladder Cancer)

This occurs when the urothelium becomes cancerous. While most cases (90% or more) are categorized as urothelial cancer, rare instances of squamous cell carcinoma and adenocarcinoma also occur. The main symptoms are bloody urine or pain during urination.



Urinary system

Main diseases 1 2 3
Main scopes used in TSD

Ureteroscope/Cystoscope

They are used for viewing the urinary bladder through the urethra and the kidneys through the urinary duct. Olympus manufactures both videoscopes and fiberscopes for this application. The videoscope version supports high-definition imaging due to its high performance CCD and is also capable of NBI. Moreover, in order to facilitate the observation of the bladder neck, both the Up and Down sides bending angle of 275 degrees are realized.

Note: A single-use scope (ureteroscope) is planned for future release.

Ureteroscope

Flexible bending function

Main diseases 1 3
Main scopes used in TSD

Resectoscope

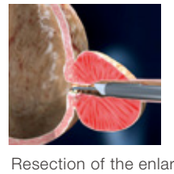
A resectoscope is a rigid endoscope for diagnosing and treating the urethra and bladder. It is inserted in from the external urethral orifice and used for the surgical resection of a lesion with high-frequency current.

Resectoscope

Method of treatment
regarding main diseases 1 3

Transurethral Resection (TUR)

TUR is a procedure in which a surgeon inserts a resectoscope from the urethra and then, using the handle, operates a loop-shaped electrode to surgically resect tissue from an enlarged prostate or a bladder tumor with an electrosurgical knife. For a safe procedure and precise resection, the solution from Olympus is the TURis procedure, in which a resection is performed by discharging electricity from the entire area surrounding the electrode through saline.



Resection of the enlarged prostate when a resectoscope is inserted transurethrally near the neck of the urinary bladder

Main therapeutic devices used in TSD

Electrosurgical Generator

The equipment enables incision of a lesion and coagulation by connecting to an endotherapy device and generating a high-frequency current.

Electrosurgical Generator

Resectoscope and special-use electrode

Method of treatment
regarding main diseases 1

Treatment through Non-Ablative Device

Olympus is rolling out iTind, a minimally invasive treatment device that ensures urine flow by expanding the urethra over the span of five days after longitudinally implanting a three-wire nitinol device in the prostate. iTind enables a patient to be treated at a doctor's office or clinic, returning home the same day, and to achieve resolution of symptoms without a permanent implant left behind.

Minimally invasive treatment device for BPH

Method of treatment
regarding main diseases 2

Transurethral Lithotripsy (TUL)

During Lithotripsy, an urologist navigates an endoscope through the urinary tract and uses laser or ultrasonic energy to break up one or more stones in the bladder, ureter, or kidney. The resulting stone fragments may be expelled naturally or can be removed using stone retrieval baskets.

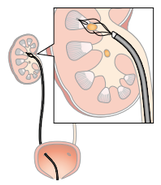


Image of removing stones with stone retrieval baskets

Main therapeutic devices used in TSD

Thulium Fiber Laser System

This product uses superpulsed thulium fiber laser technology for the removal of stones in the urinary tract (the kidney, ureter, bladder, and urethra) and for resection of soft tissue. It works by breaking up the stone into tiny pieces which are then passed out of the body during urination. The device helps shorten operation time by improving performance for breaking the stones. The device is also used to treat soft tissue (such as the prostate), enabling Olympus to provide urologists with a variety of procedural solutions. The compact size of the equipment helps to save space and make movement easier between operating rooms.

Thulium fiber laser system

Respiratory

Main diseases 1

Lung Cancer

Lung cancer consists of malignant tumors of the bronchial tubes and pulmonary epithelium. Instances are on the rise due to smoking and other causes. Among cancers, it has the highest mortality rate worldwide.*

*WHO cancer statistics: http://www.who.int/news-room/fact-sheets/detail/cancer

Main diseases 2

Emphysema

A condition caused by the over-inflation of the alveoli located at the tips of the bronchi leading to the destruction of lung functions. It is defined as one of the forms of chronic obstructive pulmonary disease (COPD) in which inhalation of tobacco or other harmful substances causes inflammation of the lungs and bronchus, which in turn causes progressive breathing difficulties.

Lungs

Main diseases 1 2
Main scopes used in TSD

Bronchoscope

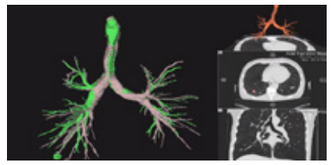
Olympus manufactures three types of bronchoscopes for viewing the lungs and bronchial tubes: videoscopes, fiberscopes, and a "hybridscope" which has both fiber-optic and video components. Bronchoscopes may be inserted either through the mouth or the nose and can travel down to examine the smallest lumens of the bronchial tree. Videoscopes have an advantage in obtaining sharp pictures of the lung through their high quality CCDs. Fiberscopes have an advantage in being smaller in diameter at the tip and therefore allow for deeper insertion into the distal portion of bronchial tubes. The hybrid type has a fiber-optic bundle in its tip and a CCD image sensor installed in its control section. This instrument incorporates advantages of both videoscope and fiberscope technology, with high insertability due to its small diameter while at the same time also producing high-quality images.

Bronchoscope

Note: In April 2021, sales started in the U.S. for Olympus' first single-use bronchoscope. › For details see page 23.

Electromagnetic Navigation System

This system supports the insertion of bronchoscopes and therapeutic devices into narrowly diverged peripheral areas in the lung. Through the spread and expansion of low-dose CT scans, lesions on the bronchial periphery are being discovered more frequently. To address this situation, the system supports bronchial tube examinations for the purpose of collecting tissues and cells of the lesion site and conducting definitive diagnosis.



Electromagnetic navigation system

Diagnostic method
regarding main diseases 1

EBUS-TBNA
(Endobronchial ultrasound transbronchial needle aspiration)

A technique mainly for the purpose of diagnosing lymph node metastasis in lung cancer. The procedure uses ultrasonic images in real time to guide the insertion of a needle into the lymph node via the trachea and bronchus for the collection by aspiration of cell or tissue samples. The collected samples are observed and diagnosed in detail by pathological examinations before deciding on the next course of treatment.

EBUS-TBNA system

EBUS bronchoscope and aspiration needle

Main endotherapy devices used in TSD

Aspiration Needle

This endotherapy device is guided by a ultrasound endoscope and is used for the collection by aspiration of cell or tissue samples from the trachea and bronchus.

Diagnostic method
regarding main diseases 1

Cytology

Cytology is performed by scrubbing a brush over a mucosa and observing the collected cells under a microscope.

Cytology of bronchus

Cytology brush

Main endotherapy devices used in TSD

Cytology Brush

A brush for collecting cells from the bronchial tubes with narrow openings. The cytology brushes are 1-5mm in diameter and less than 10mm in length.

Method of treatment
regarding main diseases 2

Bronchoscopic Lung Volume Reduction

A minimally invasive procedure for emphysema. The procedure reduces lung volume by deploying a valve within the bronchial tube to close off the lung cells. Specifically, a small, umbrella-shaped valve is implanted in the lung's upper lobe bronchus via a catheter inserted into the instrument channel of a bronchoscope. The purpose is to redirect the airflow from the unhealthy part of the lung to a normal section through the effects of a one-way valve used as the implanted valve.

Intrabronchial valve system

Endobronchial valve

Main endotherapy devices used in TSD

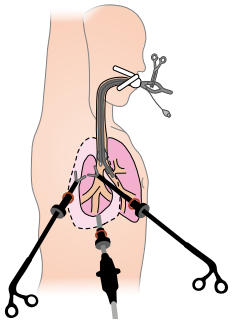
Endobronchial Valve

This valve is a therapeutic device for emphysema. It is used when medicines have no effect or in which neither a lung reduction procedure nor transplant surgery is not applicable. It is also used to treat postoperative prolonged air leaks arising from a pneumothorax or lung surgery.

Method of treatment regarding main diseases 1

Pulmonary Resection

Lung cancers are now being surgically resected using endoscopes. Thoracoscopic partial lung resection surgery can be performed for removing tumors smaller than 3cm in diameter, and lung lobectomies performed for treating areas greater than 4cm in breadth.



Pulmonary Resection (image)

Main therapeutic devices used in TSD

Surgical Systems

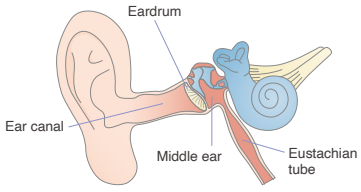
› Systems used in surgery are described on pages 36-37.

Ear, Nose, and Throat (ENT)

Main diseases 1

Tympanitis

A condition in which the infection of the middle ear by bacteria, viruses, or other germs due to a cold, etc., causing inflammation and a buildup of pus or fluid. Symptoms include headache, dizziness hearing difficulties, or the ear feeling blocked.



Ear

Main diseases 2

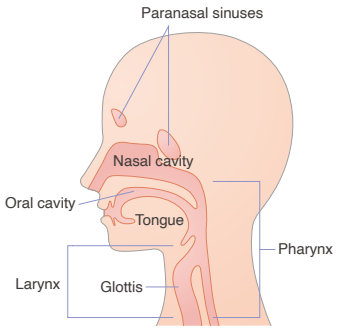
Sinusitis

What is commonly known as empyema is a condition resulting from inflammation of the paranasal sinus due to causes such as a common cold, hay fever, or dental decay. It results in a blocked nose with thick colored mucus. Other symptoms include headache and an impaired sense of smell.

Main diseases 3

Laryngeal/Pharyngeal Cancer

A throat cancer common among males. The symptoms, which include a sore throat and loss of voice, are similar to the common cold.



Nose/Throat

Main diseases 1 2 3

Main scopes used in TSD

Rhino-Laryngo Scope

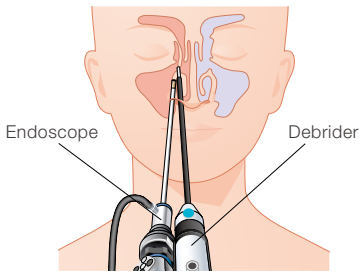
Rhino-Laryngo videoscopes are used for looking at the ears, nose, and throat. Latest videoscopes mount ultra compact, high-performance CCD, and realize great advances in image quality compared with conventional models. They are also able to perform NBI.

Rhino-Laryngo videoscope

Method of treatment regarding main diseases 2

Endoscopic Sinus Surgery (ESS)

A minimally invasive treatment for treating sinusitis (empyema) in which chronic inflammation of the paranasal sinuses (cavities enclosed in bone located near the nasal cavity) causes them to fill with pus and contaminated mucosas. Endoscopic sinus surgery uses an endoscope to provide a view inside the nose while using a debrider to perform treatment.



ESS (image)

Main therapeutic devices used in TSD

Debrider

A debrider is a surgical device for removing abnormal tissue with simultaneous use of suction and cutting.

Debrider