

A close-up photograph of a hand holding a black endoscopic instrument. The instrument features a prominent camera lens at the top, several control knobs, and a flexible shaft. The word "ENDOSCOPY" is overlaid in large, red, serif font across the center of the image.

ENDOSCOPY

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WHAT IS ENDOSCOPY?

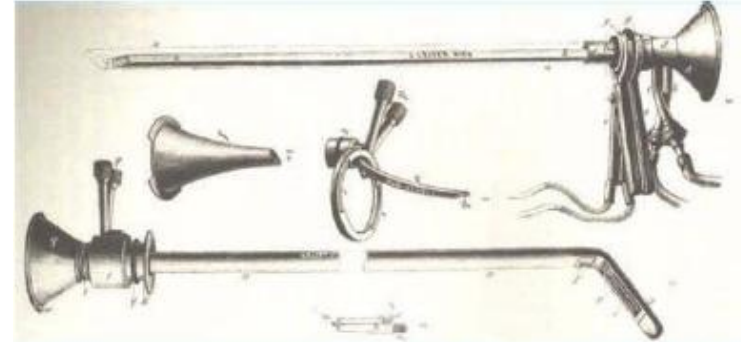
- The word **endoscopy** is derived from the Greek words "*Endo*" meaning "inside" and "*skopeein*" meaning "to see". It is a word used in medicine to describe the procedure used to see inside various parts of the body.
- An endoscopy is a procedure where the inside of the body is examined internally using an endoscope.
- Historically, it was known that it is possible to insert tubes into body orifices, but to see clearly a method was needed to illuminate the inside of the organ to be seen.
- The earliest crude attempts used oil lamps, which were later replaced by small electric filament bulbs. These were not very bright and tended to produce a lot of heat.

Endoscopy - EVOLUTION

- **400 BC: Hippocrates observes the anus using a speculum**
- 1806 - first endoscope 'Lichtleiter' for urethra, vagina & bladder inspection by Philipp Bozzini (1773–1809)
- 1826 - 'Lichtleiter' improved by Pierre Salomon Segalas (1792–1875) – better lumination (candle) and materials
- 1853 - term 'endoscope' introduced by Antonin Jean Désormeaux (1815–1894)
 - replaced 'Lichtleiter' candle with turpentine lamp and improved focusing optics
 - first to report endoscopic excision of a urethral papilloma and urethral strictures



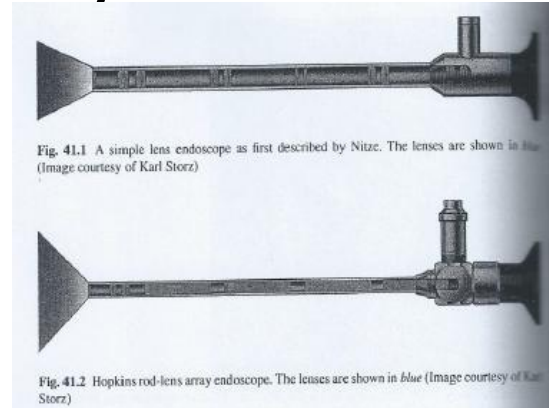
Endoscopy - EVOLUTION



- 1876 - Maximilian Nitze (1848–1906)
developed modern cystoscope
 - better optics with prisms and lenses
 - better illumination with water-cooled electric platinum filament lamp
- 1878 - vacuum lamp (Mignon lamp) introduced
- 1883 - incorporation of incandescent electric bulb (David Newman)
- 1926 - development of resectoscope by Maximilian Stern (1877–1946)
- 1931 - moving cutting loop into the resectoscope
- 1956 - use of video cameras in endoscope
- 1963 - first use of a flexible-fiber ureterorenoscope

Endoscopy - EVOLUTION

- 1966 - Hopkins rod lens developed by Prof Harold Hopkins & Dr Karl Storz

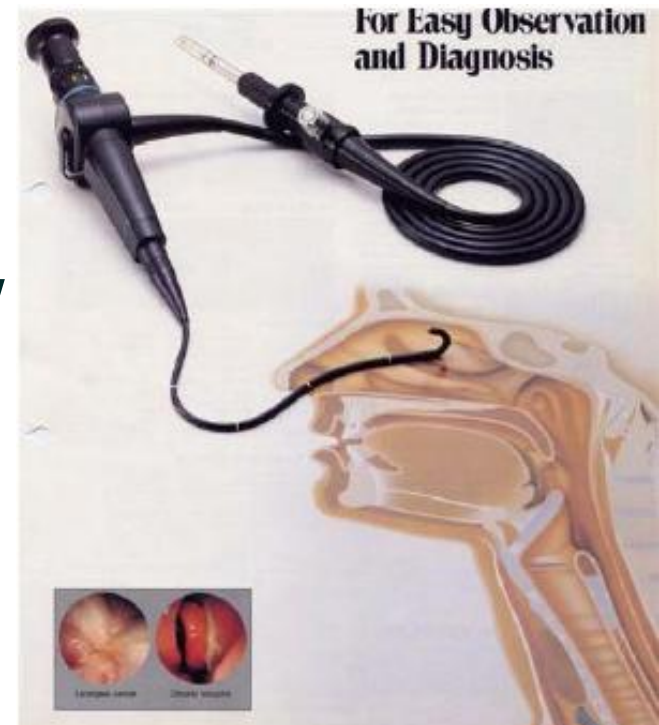


- In 1957 Basil Hirschowitz developed his prototype fiberscope



Science of Endoscopy

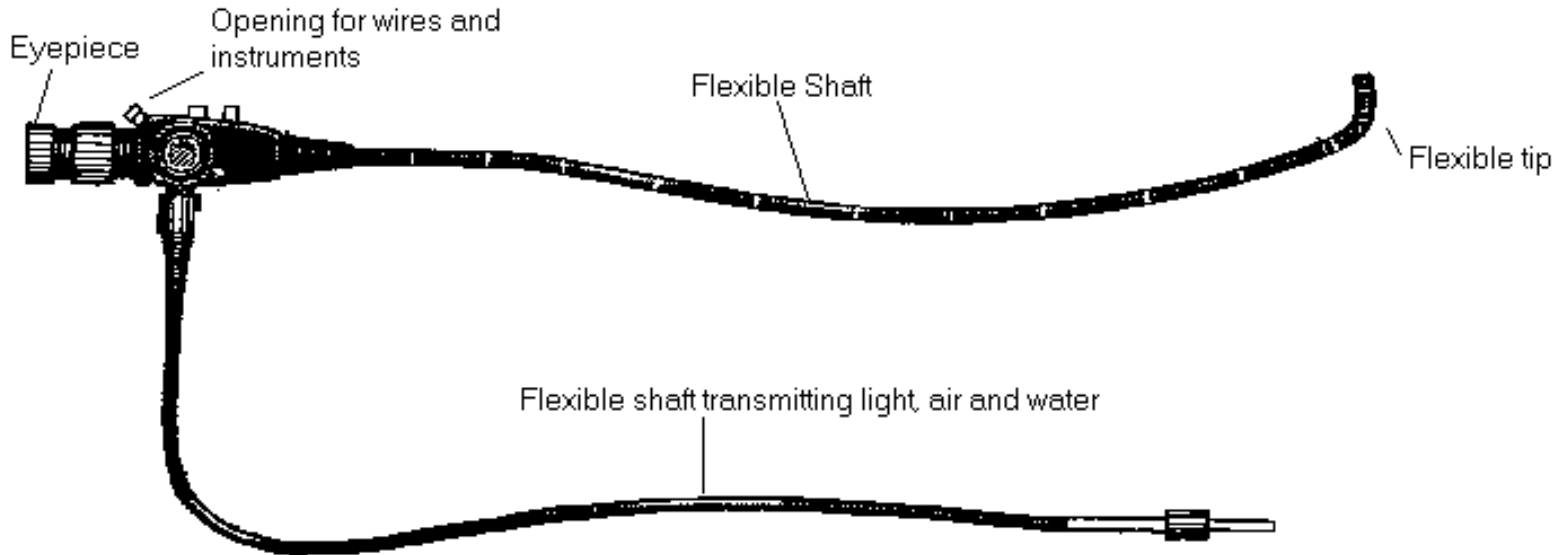
- A minimally invasive diagnostic medical procedure
- The examination of internal body cavities using a specialized medical instrument called an endoscope
- Gives visual evidence of the problem (e.g. cancer, ulceration or inflammation)
- Can be used to collect a sample of tissue or remove problematic tissue
- Used to take photograph of the hollow internal organs
- Performed under
 - Conscious sedation
 - Total Anesthesia



- Medical endoscopy really came into its own after the invention and application of fibre-optic technology to endoscopy.
- Fibre-optic endoscopes use *bundles of thin glass fibres* to transmit light to and from the organ being viewed. These fibres use the principle of *total internal reflection* to transmit almost 100 % of the light entering one end to the other end.

An Endoscope

A typical endoscope



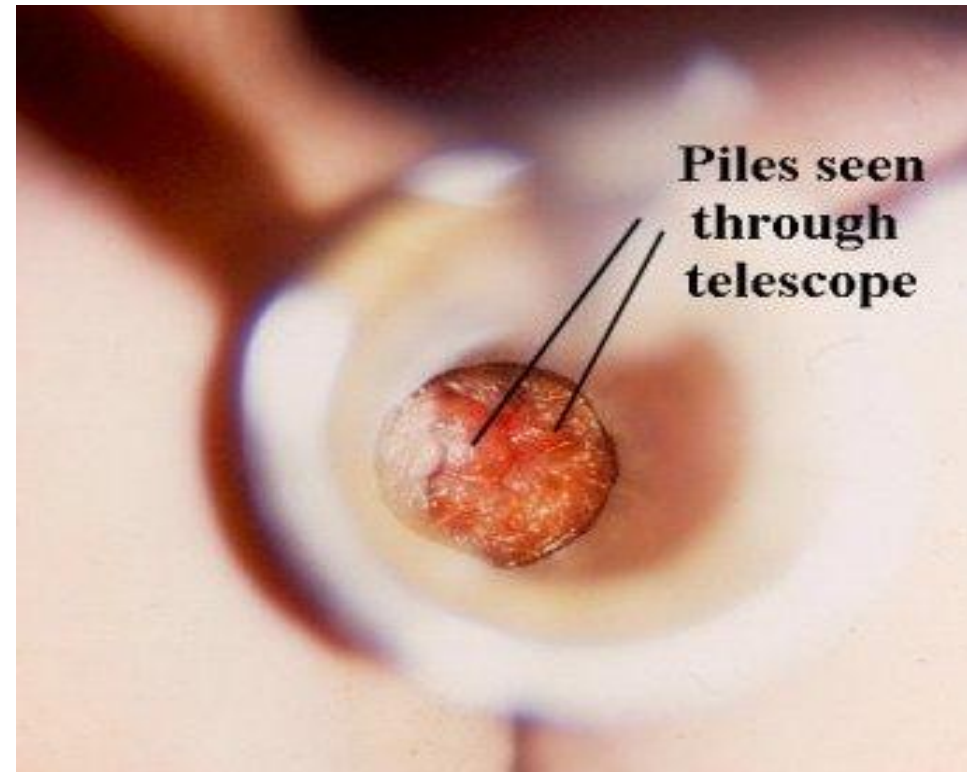
Fibre-optic endoscopes are delicate and expensive items.

The fibres have to be made of special glass.

“Endoscopy” is a general term. There are specific words for viewing specific parts and organs of the body.

➤ Endoscopy done through existing body openings can usually be done under *local anaesthesia*, but other types that require a small puncture to see an "internal cavity" may need hospital admission and a general anaesthetic.

➤ In each type small pieces of tissue can be removed for tests and some other procedures can be done.



ENDOSCOPY



Endoscopy, is the examination of internal body cavities using a specialized medical instrument called an endoscope.

Physicians use endoscopy to diagnose, monitor, and surgically treat various medical problems.

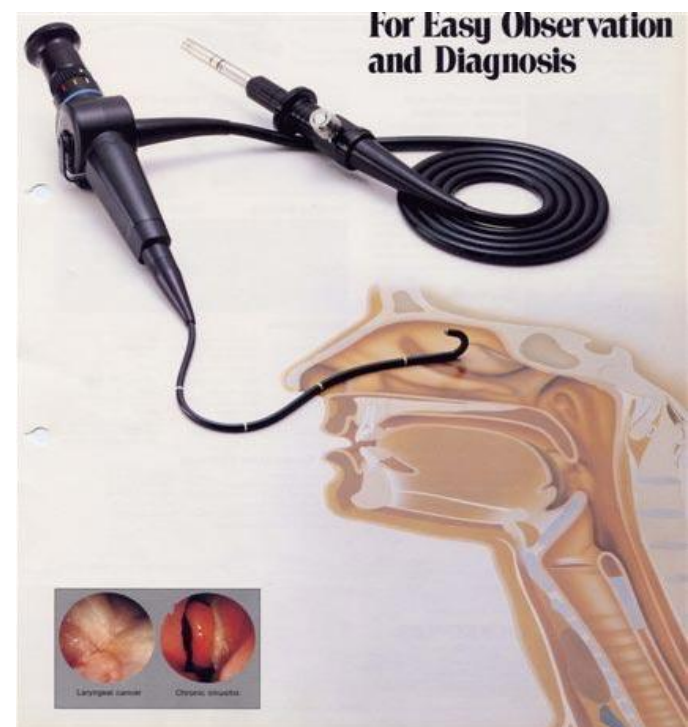
Risks of Endoscopy

- Sedation
- Damage to dentition
- Aspiration
- Perforation or hemorrhage after endoscopic dilatation
- Perforation, infection, and aspiration after percutaneous endoscopic gastrostomy insertion
- Perforation or hemorrhage after flexible sigmoidoscopy /colonoscopy with polypectomy
- Pancreatitis, cholangitis, perforation or bleeding after ERCP (Endoscopic retrograde cholangio-pancreatography)



ENDOSCOPY

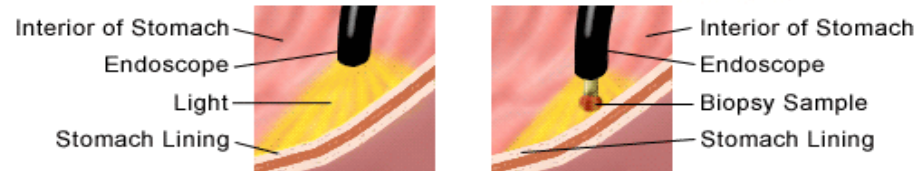
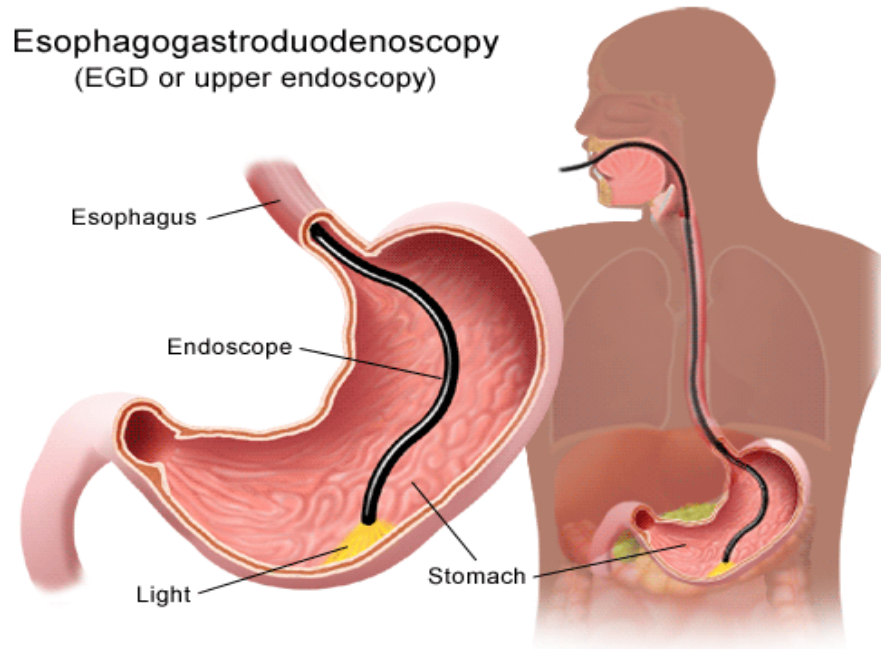
- An endoscope is a slender, flexible tube equipped with lenses and a light source. Illumination is done by the help of a number of optical fibres.
- Reflected light rays are collected by CCD(Charge coupled device) and electrical signals are produced, which are fed to the video monitor to get image.
- Through one channel of endoscope water and air is conducted to wash and dry the surgical site.



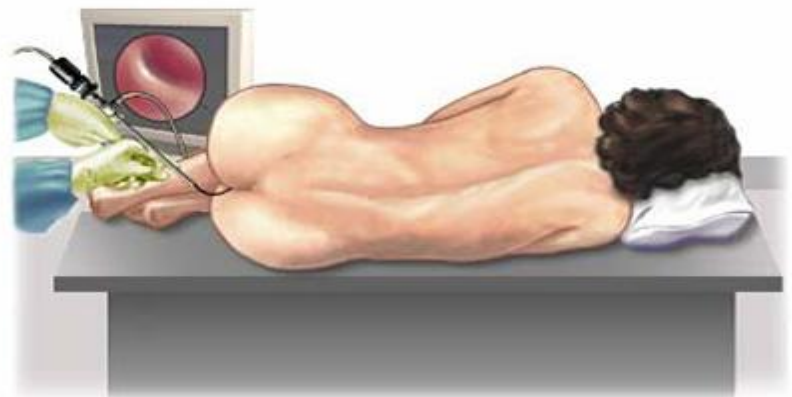
ENDOSCOPY

- The endoscope also has a channel through which surgeons can manipulate tiny instruments, such as forceps, surgical scissors, and suction devices.
- A variety of instruments can be fitted to the endoscope for different purposes.
- A surgeon introduces the endoscope into the body either through a body opening, such as the mouth or the anus, or through a small incision in the skin.

Esophagogastroduodenoscopy (EGD or upper endoscopy)

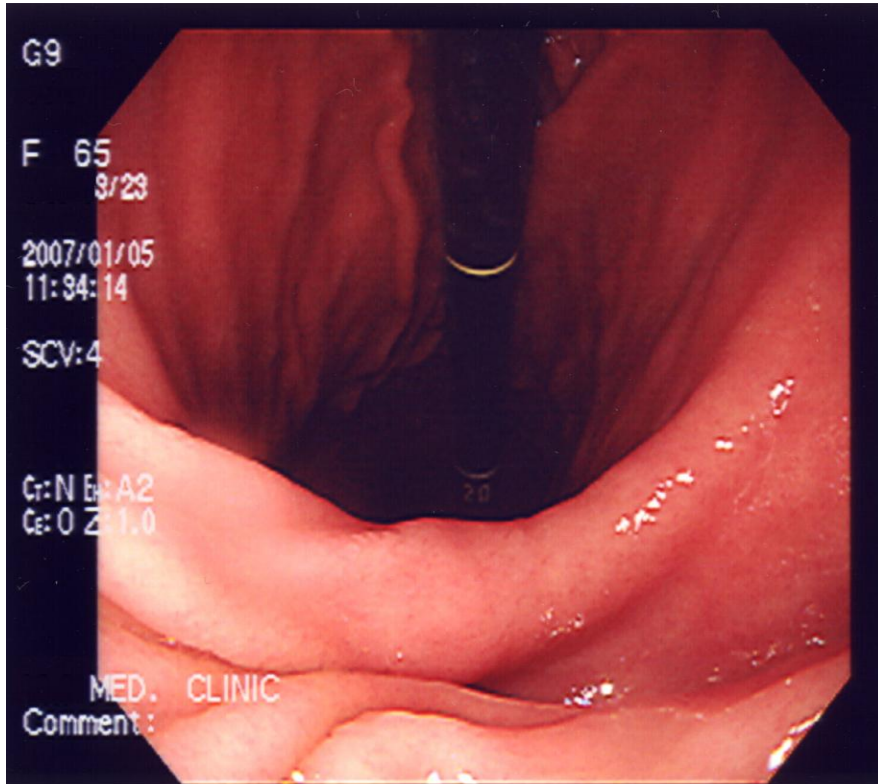


Lower endoscopy



ENDOSCOPY

- The endoscope gives visual evidence of the problem, such as ulceration or inflammation
- It can be used to collect a sample of tissue; remove problematic tissue, such as polyps (abnormal growth of tissue)
- It is used to take photograph of the hollow internal organs



ENDOSCOPY

- Depending on the body part, each type of endoscopy has its own special term, such as
 - laparoscopy (abdomen, uterus, fallopian tube),
 - laryngoscopy (vocal cords),
 - bronchoscopy (lungs),
 - colonoscopy (colon),
 - arthroscopy (joint)
 - Gastroscopy (Stomach)
 - Colposcopy (Vagina and Cervix)
 - Cystoscopy (Bladder)
 - Esophagoscopy (Esophagus)
 - Neuroendoscopy (Areas of the brain)
 - Proctoscopy (Rectum and Sigmoid Colon)
 - Sigmoidoscopy (Sigmoid colon)
 - Thoracoscopy (Pleura covering the lungs and structures covering the heart)

Types of endoscopy

Name of procedure	Name of tool	Area or organ viewed	How endoscope reaches target area
Gastroscopy	Gastroscope	Stomach and duodenum (beginning of the small intestine)	Inserted through the mouth
Laparoscopy	Laparoscope	Stomach, liver, or other abdominal organ, including female reproductive organs (uterus, ovaries, fallopian tubes)	Inserted through a small, surgical opening in the abdomen
Colonoscopy	Colonoscope	Entire length of the colon and large intestine	Inserted through the anus
Colposcopy	Colposcope	Vagina and cervix	A speculum is inserted into the vagina. The colposcope is placed at the opening of the vagina but does not enter it

Types of endoscopy

Name of procedure	Name of tool	Area or organ viewed	How endoscope reaches target area
Cystoscopy	Cystoscope	Inside of the bladder	Inserted through the urethra
Esophagoscopy	Esophagoscope	Esophagus	Inserted through the mouth
Bronchoscopy	Bronchoscope	Trachea (windpipe) and bronchi of the lungs	Inserted through the mouth
Laryngoscopy	Laryngoscope	Larynx (voice box)	Inserted through the mouth

Neuroendoscopy	Neuroendoscope	Areas of the brain	Inserted through a small incision in the skull near the area to be viewed
Proctoscopy	Proctoscope	Rectum and sigmoid colon	Inserted through the anus
Arthroscopy	Arthroscope	Joints	Inserted through a small incision over the area to be viewed
Thoracoscopy	Thoracoscope	Pleura covering the lungs and structures covering the heart	Inserted through a small surgical opening in chest
Sigmoidoscopy	Sigmoidoscope	Sigmoid colon (bottom part of the colon)	Inserted through the anus