# Minimally Invasive(GENERAL SURGERY)

# **Definition**:

Surgery performed through small incision or via natural oriffices using specialized instruments to minimise tissue damage and promote faster recovery compared to traditional surgery

# Types;

**laparoscope**: goes into your abdominal cavity, Using a thin telescope with a camera and light to visualize internal organs through small abdominal incisions Port may be 1(SILS),2,3,4,5 or more if needed

# **Robotic surgery:**

An advanced form of minimally invasive surgery uses robotic arms to operate through the small incisions. This is called robotic surgery. A specially trained surgeon operates the robot arms from a console within the operating room. Robotics allow for greater precision and control in smaller areas. Most robotic surgery procedures use several ports, but sometimes single-port surgery is required

# Endovascular surgery:

Endovascular surgery involves threading a tiny catheter through a blood vessel and operating through it. It takes only one tiny incision to access the blood vessel. Often, endovascular surgeons can puncture the skin with a needle rather than cutting it. This minimizes bleeding. Surgeons thread the catheter over a guidewire, then remove the wire and pass surgical instruments through the catheter to operate.

# Endoscopic surgery

Through natural orifice like your nose or mouth. Surgeons can operate through these endoscopes long flexible tube using long, narrow tools, without cutting through your skin at all. This is called "natural orifice" endoscopic surgery. "Endoluminal" procedures happen within the walls of your organ, while "transluminal" procedures cut through one of the walls of organ to enter in abdomen Endoscopy (stomach)

Colonoscopy( large bowel)

### Indications

**Laparoscopic surgery**: Gallbladder removal (cholecystectomy), appendix removal (appendectomy) adrenal removal (adrenalectomy) and hernia repair.

Endovascular surgery: Angioplasty, atherectomy, embolization and stenting.

Endoluminal surgery in your gastrointestinal tract: Tumor removal (endoscopic submucosal dissection or transanal endoscopic microsurgery)

Bariatric surgeries: Gastric sleeve surgery and gastric bypass surgery for weight loss.

# Vaginal Surgery (VAMIS):

Accesses the pelvic cavity through vagina

**Video-assisted thoracic surgery (VATS):** Thoracoscopy-guided procedures to treat cancer in your chest cavity, or to repair pectus excavatum (Nuss procedure).

**NOTES**:Natural orifice translumenal endoscopic surgery (N.O.T.E.S) is a technique that allows access to the peritoneal cavity through natural orifices (oral, rectal, vaginal, vesical) without passing through the anterior abdominal wall e.g.TransOral Endoscopic Thyroidectomy Vestibular Approach(TOETVA) vNOTES (through vagina) e.g. cholecystectomy, LAVH

Anesthesia: While open surgery almost always requires general anesthesia, some minimally invasive procedures don't. You may only need local anesthesia at the incision site, with or without sedation to help you relax. If you're having endoscopic surgery, you may not need anesthesia at all. A numbing agent in your throat can help the endoscope pass through without triggering your choking reflex.

Incisions: The hallmark of minimally invasive surgery is small incisions, if any. These small incisions for endoscopes and surgical instruments are typically a half-inch long or less. An incision might be slightly larger if your surgeon needs to remove an organ through it — or smaller, if it's in your brain or vascular system. Smaller incisions make for an easier recovery, with less pain and less risk of complications.

Operating and recovery time: In general, operations take longer when surgeons use minimally invasive methods because there are many more steps, tools and helpers involved. This is especially true for robotic surgery. On the other hand, the recovery time tends to be much faster. You can often go home the same day as your procedure, and your smaller incision wounds heal in weeks rather than months.

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Some of the equipment they use includes:

Endoscopes. Endoscopes are long, narrow tubes with a lighted video camera at the end. They come in different sizes for looking inside different body cavities. They can be rigid or flexible.

Imaging equipment. Monitors project video from the endoscope during surgery. Surgeons often use other imaging technology to locate the surgical site, such as ultrasound or fluoroscopy. Endovascular catheters. These tiny catheters travel through blood vessels. Surgeons use guidewires and X-ray imaging to guide them to the surgical site, and then operate through them. Trocars. Trocars are tubes that the surgical team places within your keyhole incisions (ports). They place the other surgical instruments, including endoscopes, through the trocars. Insufflators deliver low-pressure carbon dioxide gas through a tube into your body cavity. Surgeons use insufflators when they need to inflate your cavity for visibility and access. Balloons. When surgeons don't want or need to inflate your entire body cavity, they might use an inflatable balloon to make space to operate just where they need it. They place the balloon at the end of a trocar, endoscope or catheter and inflate it by pumping gas through the tube. Surgical instruments. Minimally invasive surgical instruments are long and narrow to operate within narrow spaces. Surgeons manipulate them through trocars, endoscopes or catheters.

Da Vinci Surgical System. The da Vinci Surgical System is the robotic system that surgeons use in robotic surgery. It includes an operating console, a separate video screen and an equipment cart that holds the surgical instruments and camera. The console operates four robotic arms. Advertisement

### Advantage

D:Improves Diagnosis S: reduced SSI P: reduced postoperative Pain C: better Cosmesis R: Return to work early (faster recovery less hospital stay) Reduced blood loss. Reduced risk of surgical complications.

May not require general anesthesia. May make surgery possible for some people where it wasn't otherwise.

# disadvantages :

Requires special training and more time for surgery for new surgeons May not be available locally. more expensive. Inexperienced Hand complication more Difficulty in complicated case Not suitable if heart and lung disease present

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