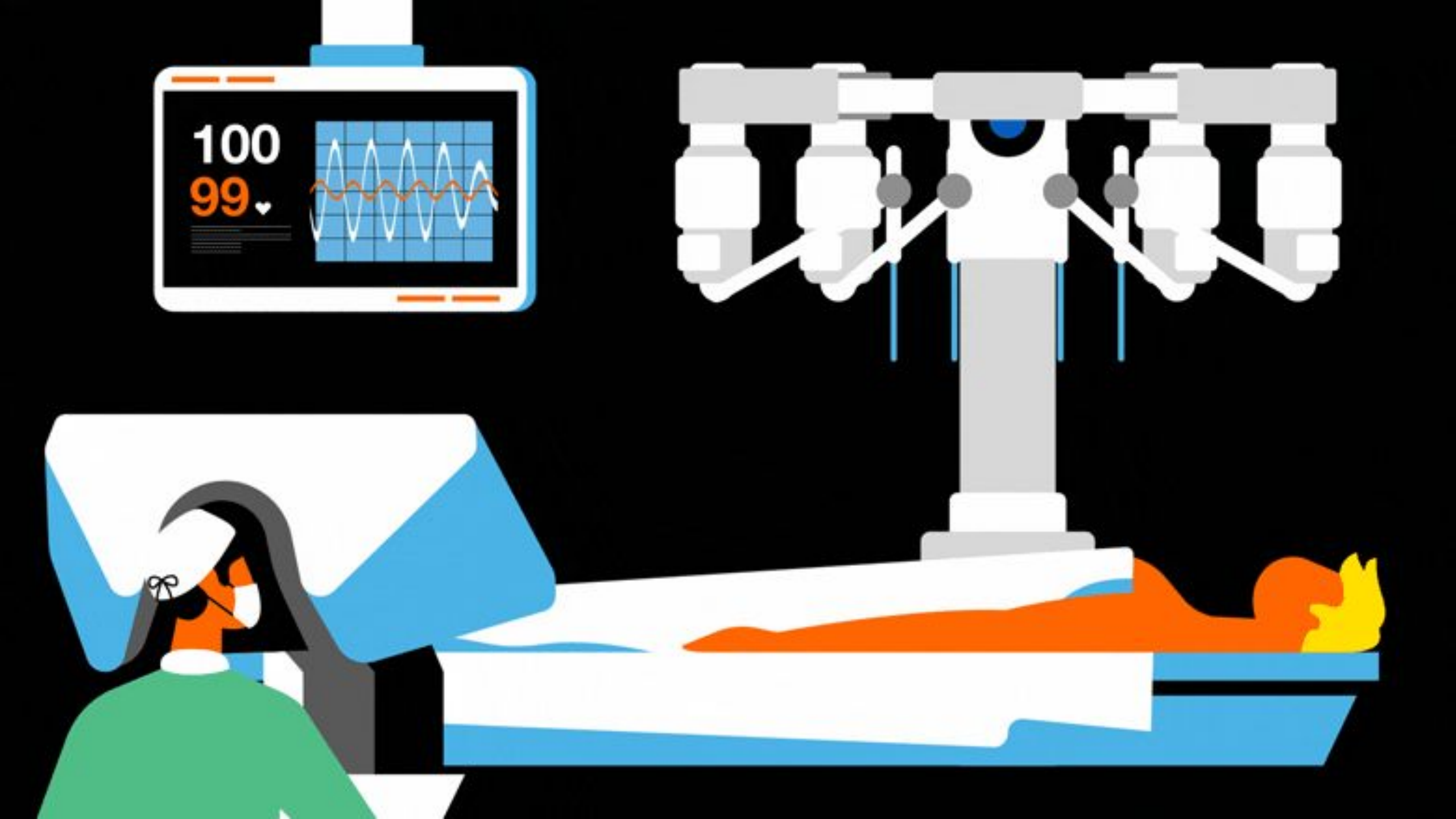
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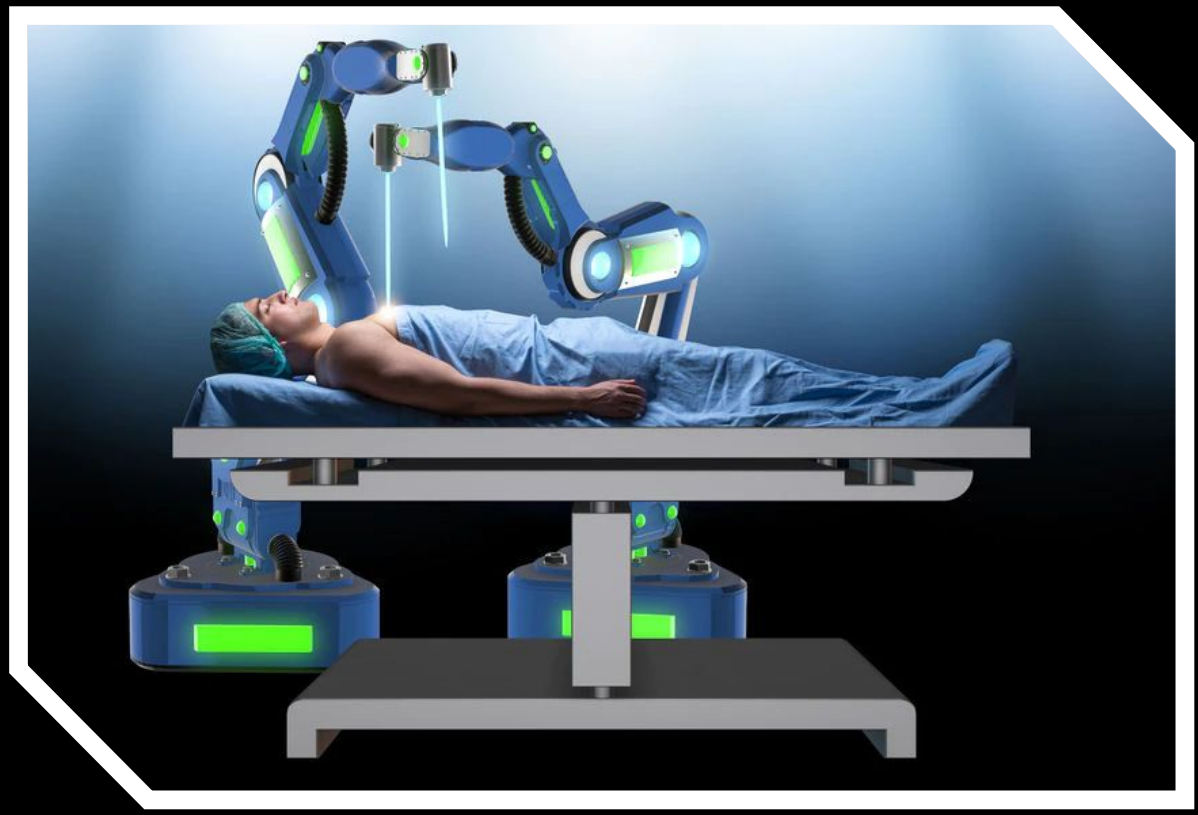
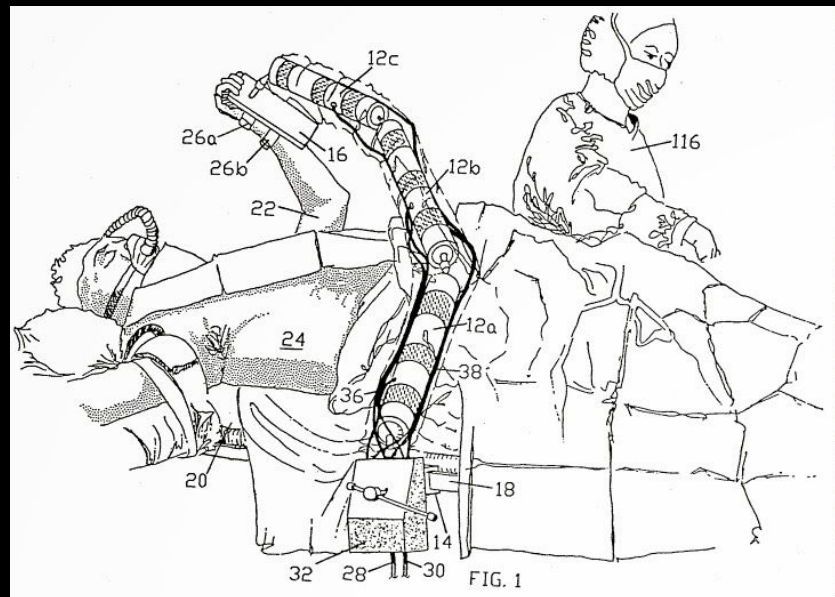
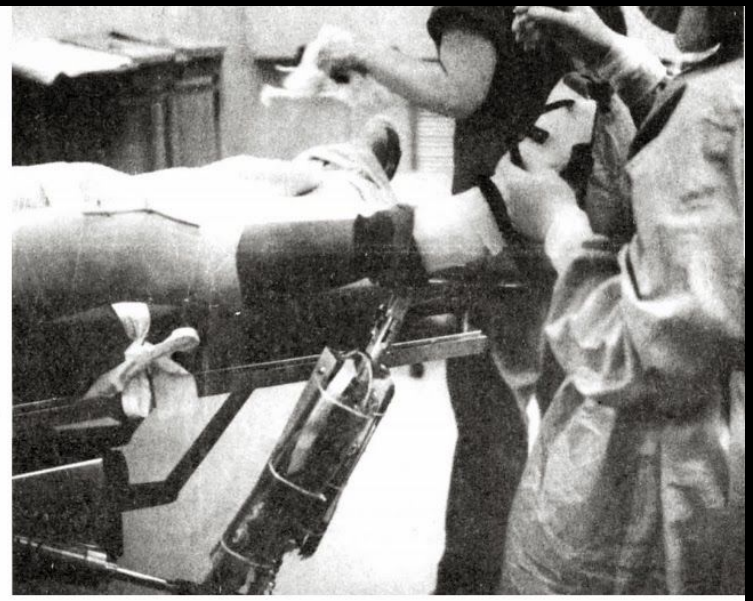
What Is Robotic Surgery?

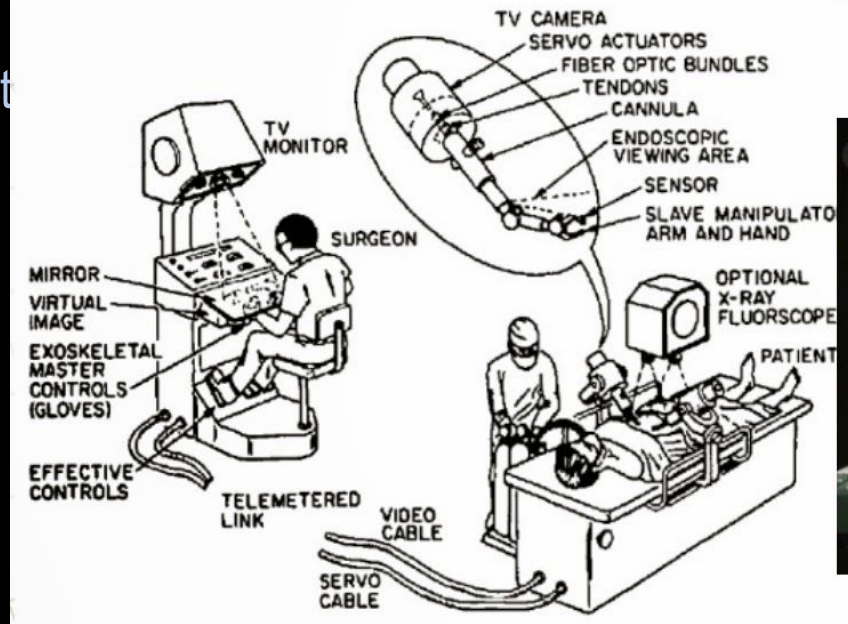
- Robotic surgery is an advanced form of minimally invasive surgery that makes use of computer-controlled robots to do what humans can’t, and what they can do, but better. When you consider how bulky human hands are compared to a robot’s, which can be incrementally thinner while retaining a high degree of dexterity that allows for maneuvering in tight places within the body, you can see why this is. Additionally, when you introduce mechanical elements paired with feedback-controlled motions to surgery, you arrive at actions that are much smoother than anything achieved with a human hand. In effect, this gives surgeons a lot more control to do what they must while also reducing tissue trauma.

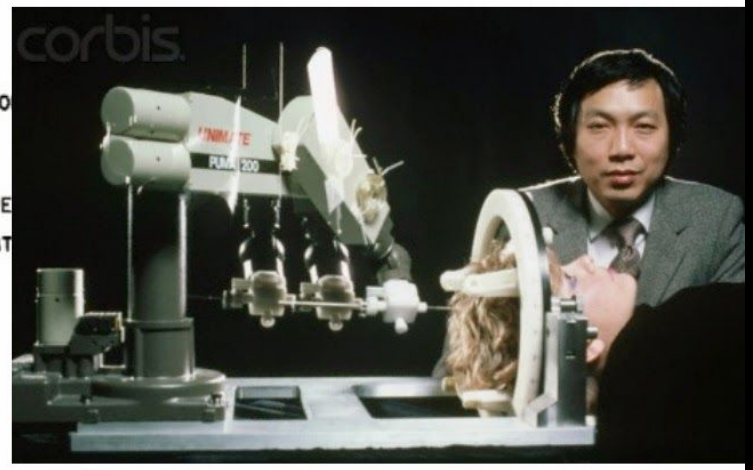


- The first surgical robot was called the ARTHROBOT and was used for the first time in 1983 by Canadian physicians. After that, other robots were used to perform eye surgery and later on prostate surgeries. These developments came slowly at first during the 1980's Initially surgeries were being performed by surgeons with precision and with the patient in the same room as the robot. However, modern technology now makes it possible for surgeons to operate on patients far away. This has proven helpful to doctors who can operate on soldiers injured on battlefields in foreign countries.





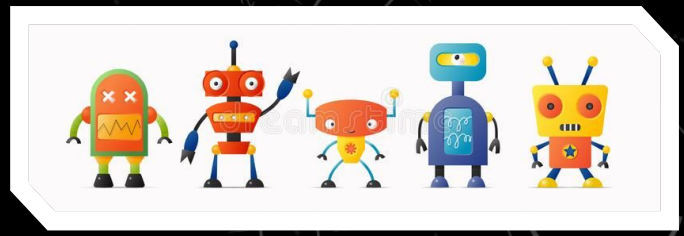




How Does It Work?

WHILE THERE ARE A VARIETY OF ROBOTIC SURGERY PROCESSES, THE VAST MAJORITY WILL INVOLVE A SURGEON SITTING AT A SPECIAL CONSOLE WITH HAND AND FOOT CONTROLS THAT ALLOW THEM TO REMOTELY AND PRECISELY CONTROL SURGICAL INSTRUMENTS ATTACHED TO ROBOTIC ARMS. ADJUSTMENTS CAN ALSO BE MADE TO CHANGE THE SCALE OF THE ROBOT'S MOVEMENT. FOR EXAMPLE, A THREE-TO-ONE SCALE WOULD MEAN THAT THE TIP OF THE ROBOT'S ARM WILL MOVE ONE INCH FOR EVERY THREE INCHES THE SURGEON'S HAND MOVES. TO SEE, A SMALL 3D CAMERA IS INSERTED INTO THE PATIENT THROUGH A VERY SMALL INCISION, WHICH GIVES THEM A MAGNIFIED 360° VIEW OF THE OPERATIVE FIELD ON A HIGH DEFINITION MONITOR THAT ESSENTIALLY PLACES THEM INSIDE THE PATIENT. A SECOND SURGEON OR SURGICAL TECHNICIAN WILL ALSO BE POSITIONED NEAR THE PATIENT TO CONFIRM THE CORRECT PLACEMENT AND FUNCTION OF THE SURGICAL INSTRUMENTS.

TOP 5 ROBOTIC SURGERY SYSTEMS



- da Vinci by Intuitive Surgical
- Ion by Intuitive Surgical
- Mako by Stryker
- NAVIO by Smith & Nephew
- Monarch by Auris Health

THREE MAIN COMPONENTS THAT MAKE UP THE DA VINCI SYSTEM:

1. Surgeon console: Where the surgeon sits to control the instruments while viewing the patient's anatomy in high-definition 3D. The instruments are "wristed" and move like a human hand, but with a far greater range of motion.

2. Patient cart: Positioned near the patient on the operating table, the patient cart holds the camera and instruments that move in real-time in response to the surgeon's controls from the console.

3. Vision cart: The vision cart makes communication between components of the system possible and supports the 3D high-definition vision system.

THE DA VINCI SYSTEM CONSISTS OF THREE CORE COMPONENTS:

A SURGEON CONSOLE, A VISION TOWER, AND A PATIENT CART WITH FOUR ROBOTIC ARMS

Vinci Si patient-side cart

da Vinci Xi patient-side cart

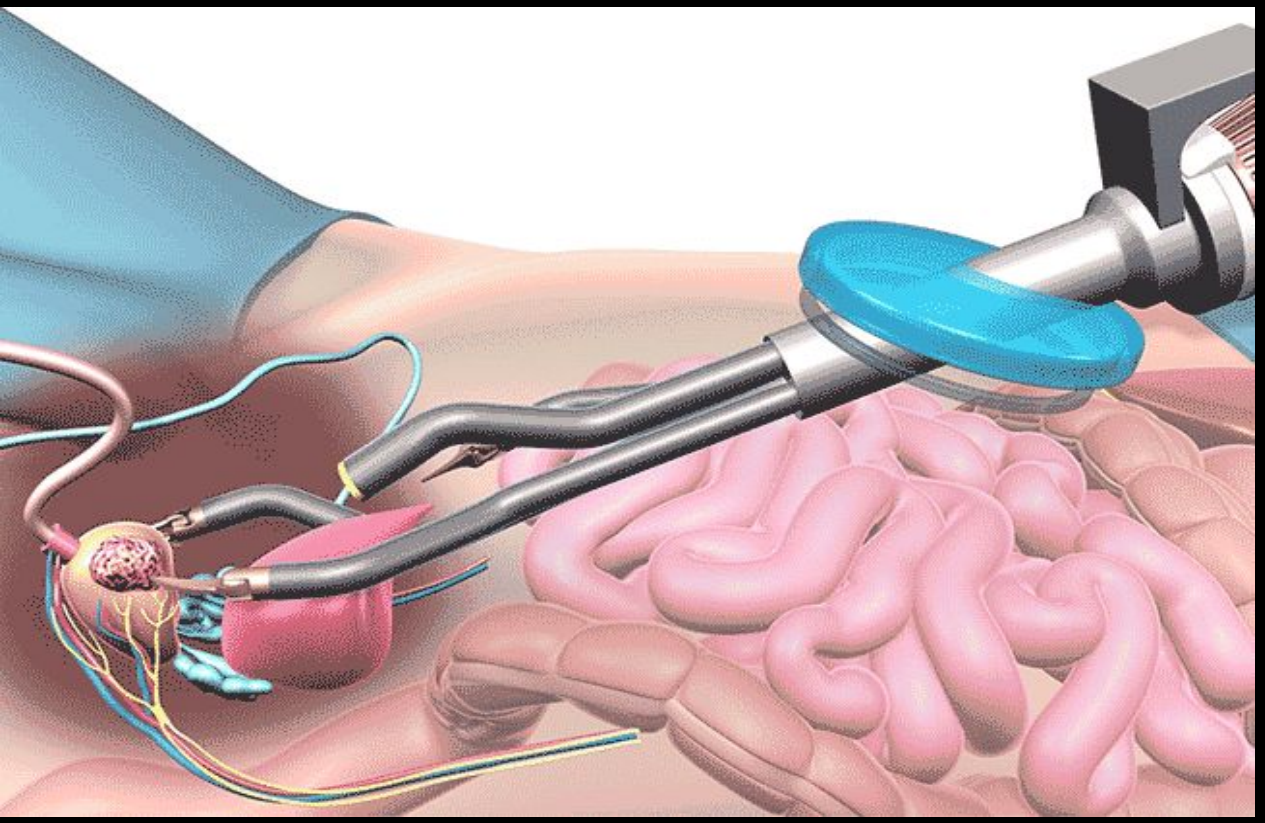



da Vinci SURGICAL SYSTEM, WHICH HAS RECEIVED FDA CLEARANCE FOR USE IN A NUMBER OF SURGERY TYPES THAT INCLUDE-

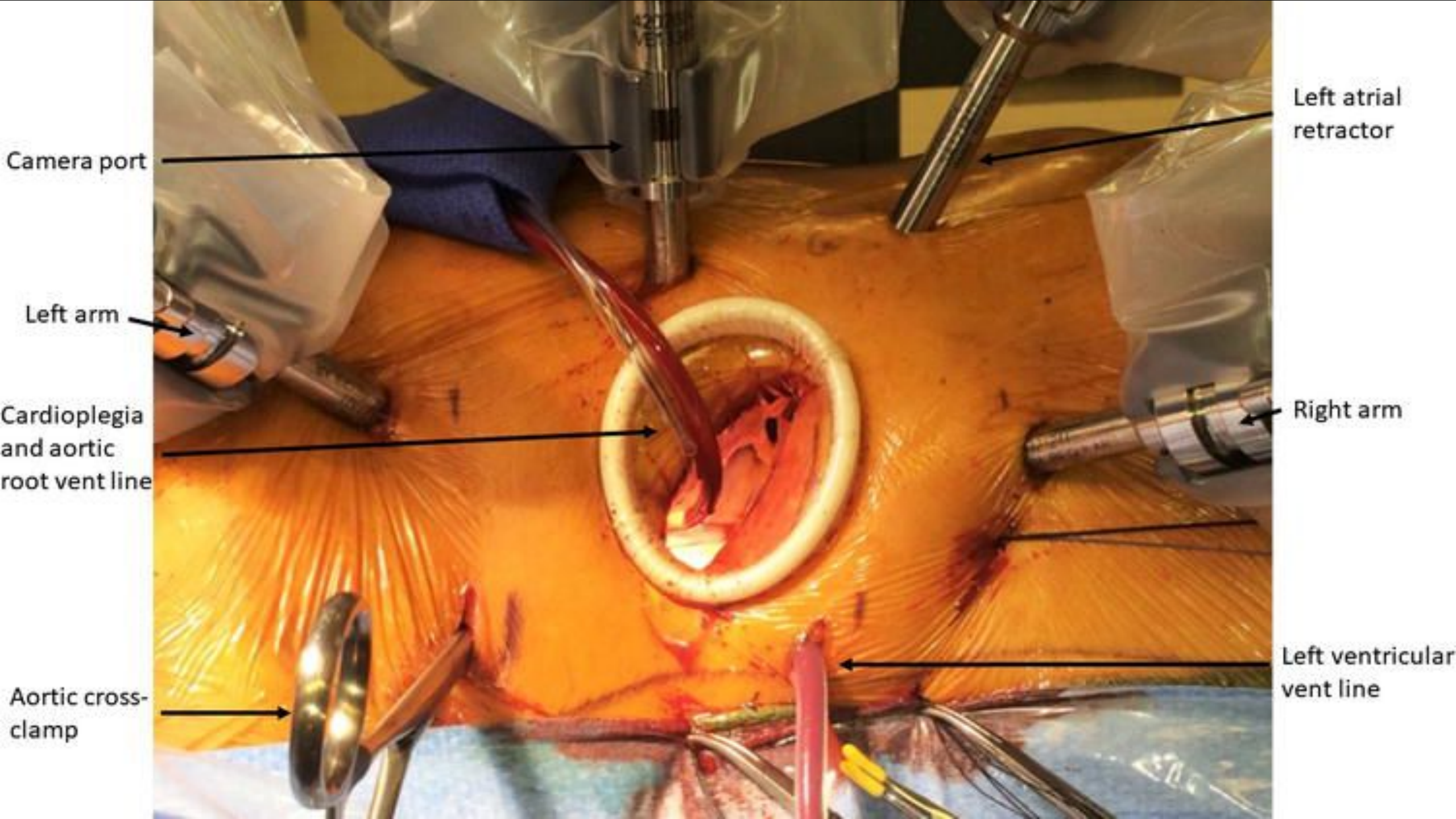
- ***Cardiac****: Where appropriate, minimally invasive surgery with da Vinci can be used in place of open heart surgery.*
- ***Colorectal****: Colon and rectal resection surgery, as well as rectopexy, may be taken care of with da Vinci.*
- ***General surgery****: General surgery covers many types of procedures, including inguinal hernia repair that surgeons can perform with da Vinci.*
- ***Gynecology****: Doctors may suggest surgery, such as benign hysterectomy, with da Vinci.*
- ***Head and neck****: Transoral (through the mouth) robotic-assisted surgery may be an option for mouth and throat surgery.*
- ***Thoracic****: When surgery is an option for conditions such as lung cancer, doctors may choose minimally invasive surgery with da Vinci.*
- ***Urology****: Doctors may suggest surgery with da Vinci for urology procedures involving the prostate or kidney.*

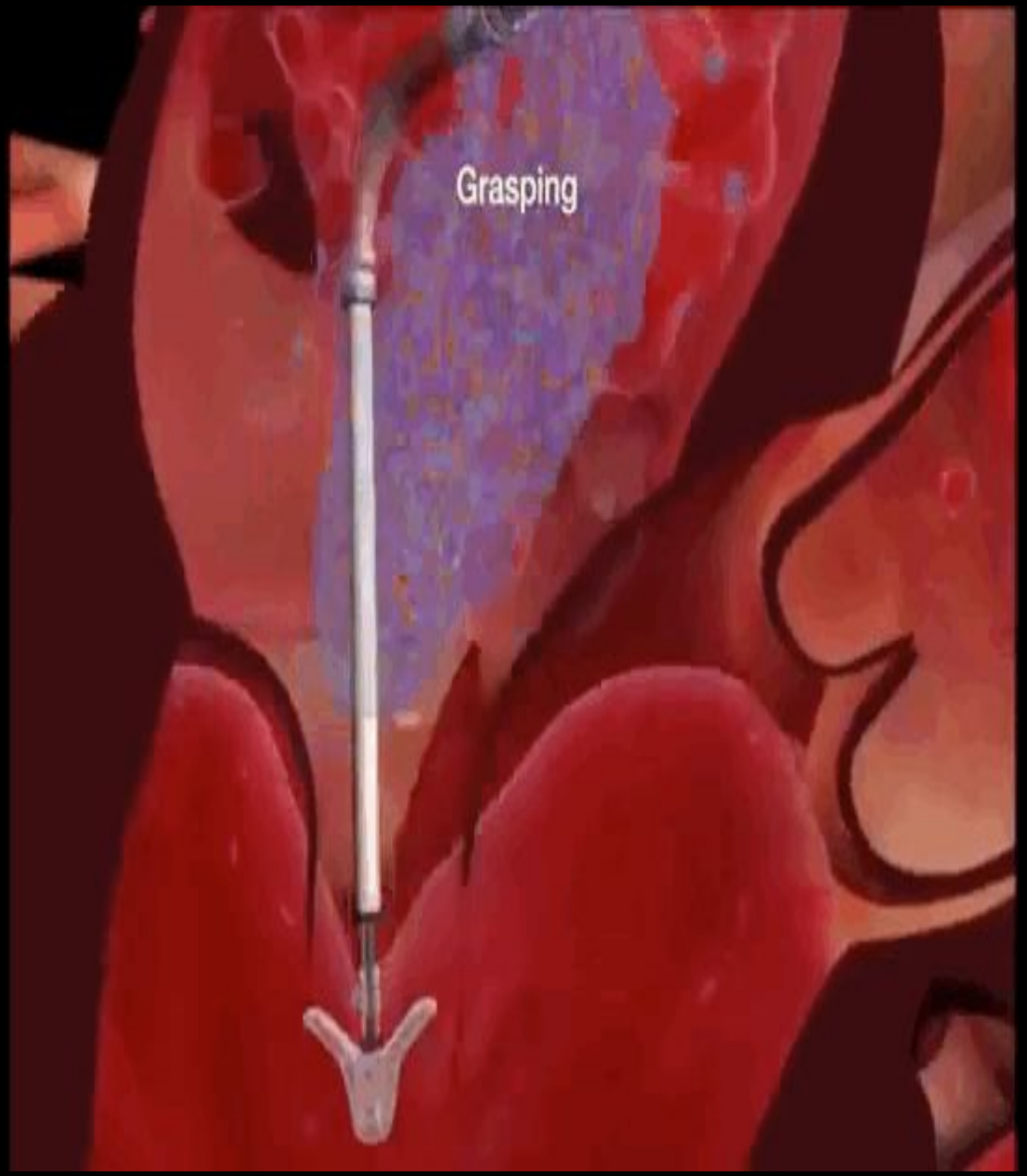
PROSTATE SURGERY-

USING SINGLE PORT SP ROBOT

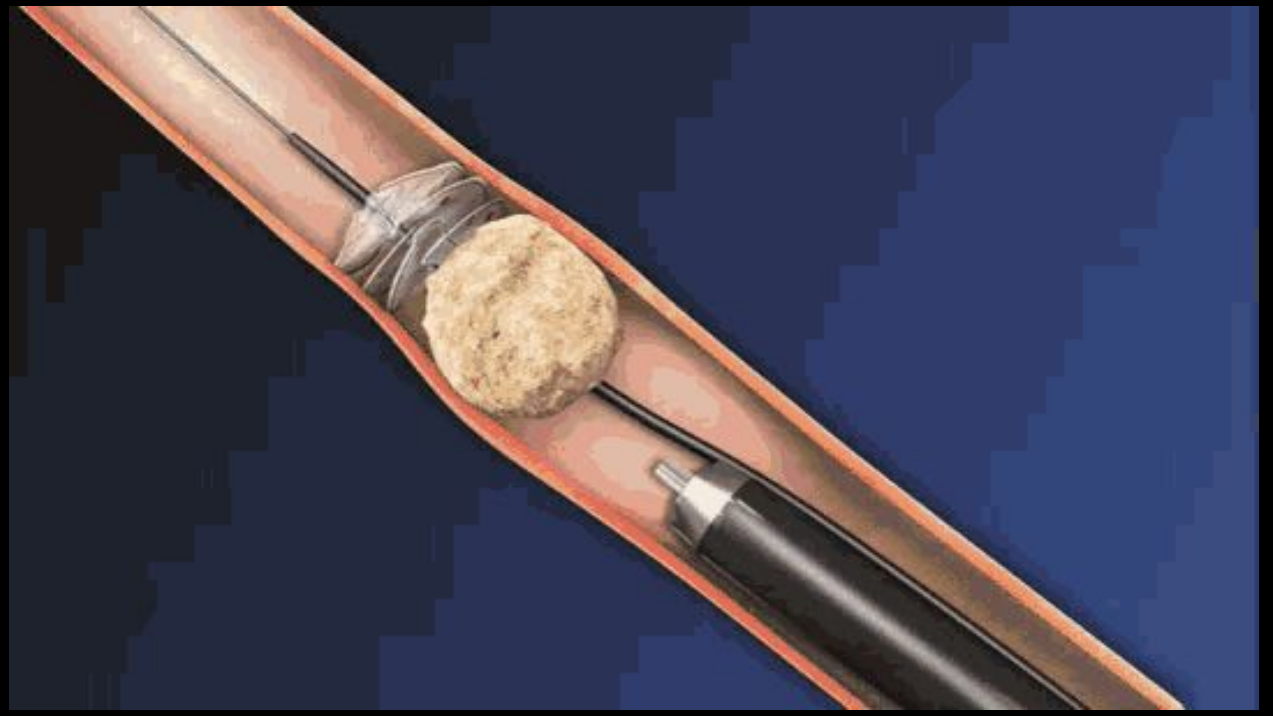


Robotic Dental Surgery

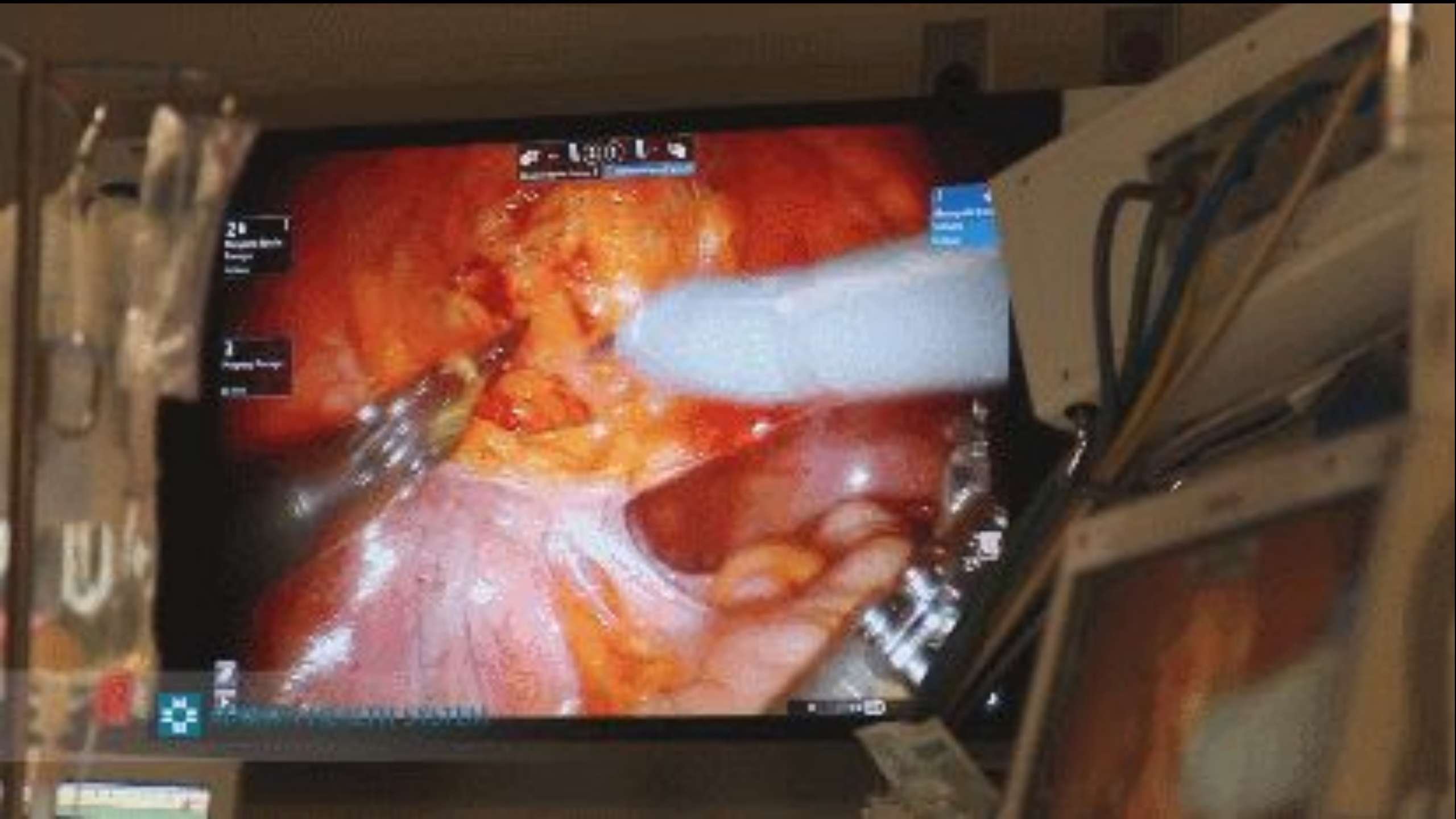

Camera port
Left arm
Cardioplegia and aortic root vent line
Aortic cross-clamp
Left atrial retractor
Right arm
Left ventricular vent line



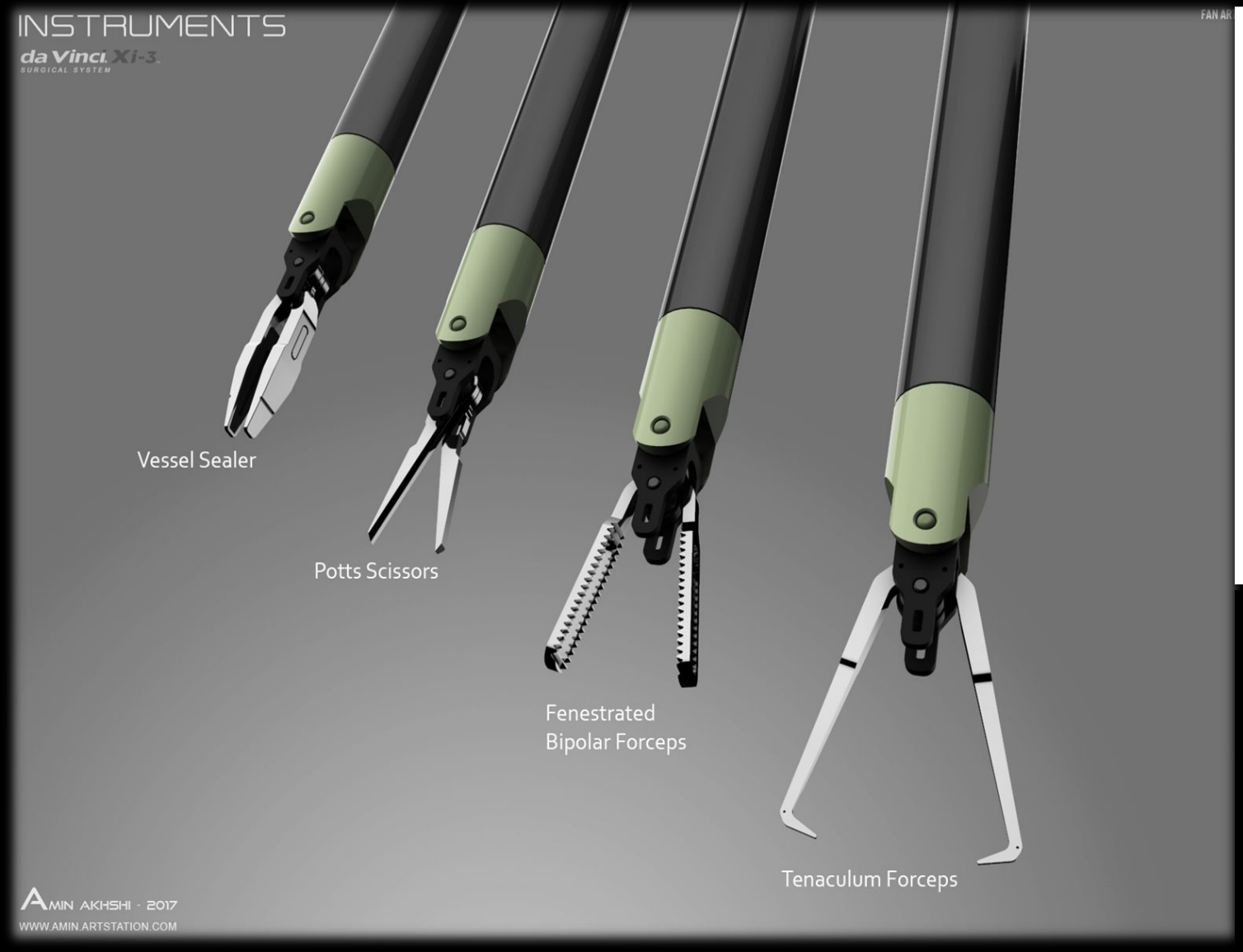
MitraClip Procedure



Kidney stone destroyer



WHAT ARE THE COMMON INSTRUMENTS USED IN ROBOTIC SURGERY?



STANDARD/S PNs

EndoWrist PK™ Dissector

Hot Shears™ (Monopolar Curved Scissors)

Requires Tip Cover:

Mega Needle Driver

SutureCut™ Needle Driver

Large Needle Driver

Tenaculum Forceps

Fenestrated Bipolar Forceps (Bipolar Cadiere)

Cobra Grasper

Cadiere Forceps

Maryland Bipolar Forceps – Fenestrated

Permanent Cautery Spatula

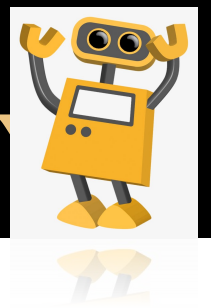
Prograsp

A

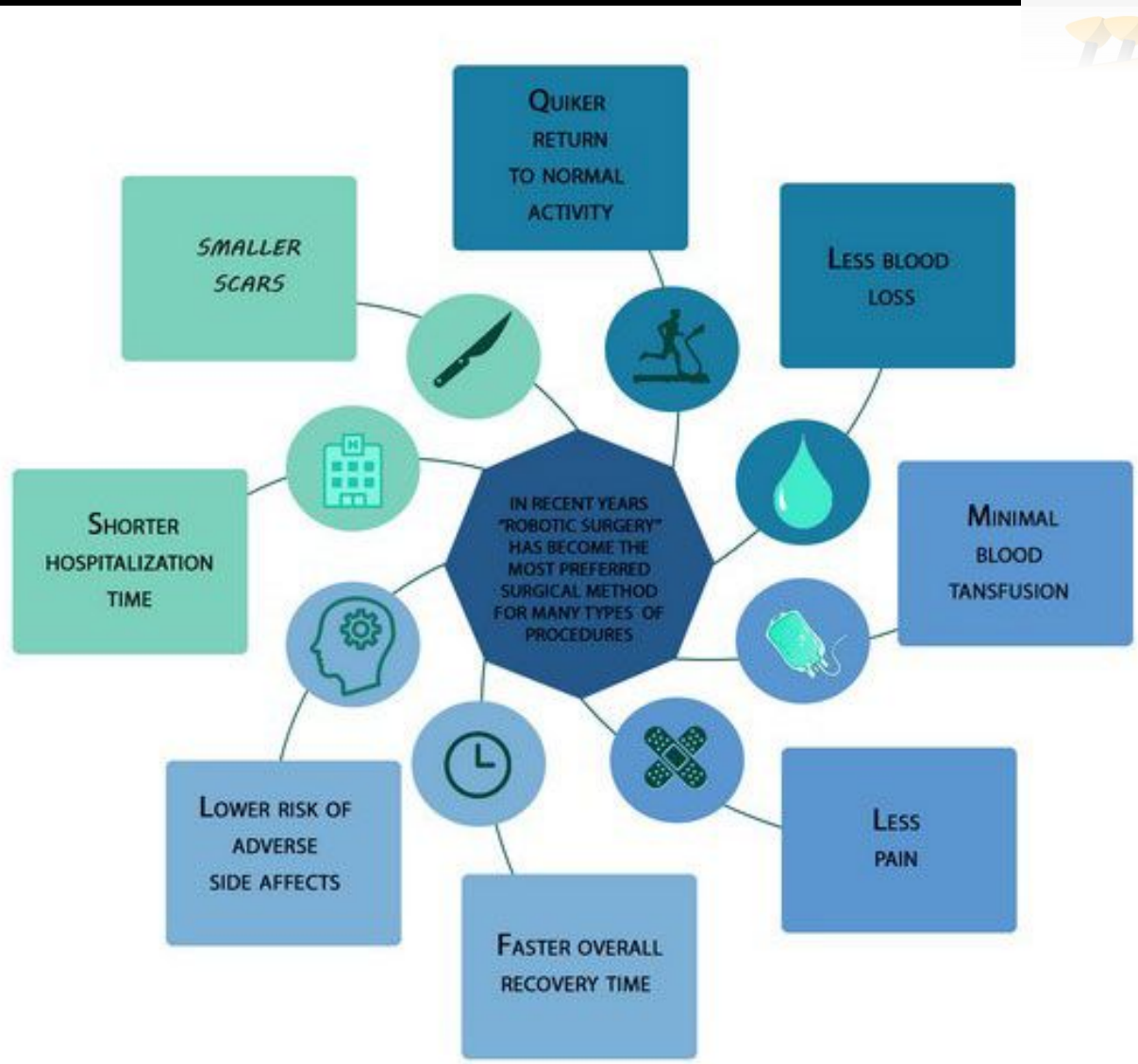
EUMC SEOUL

B

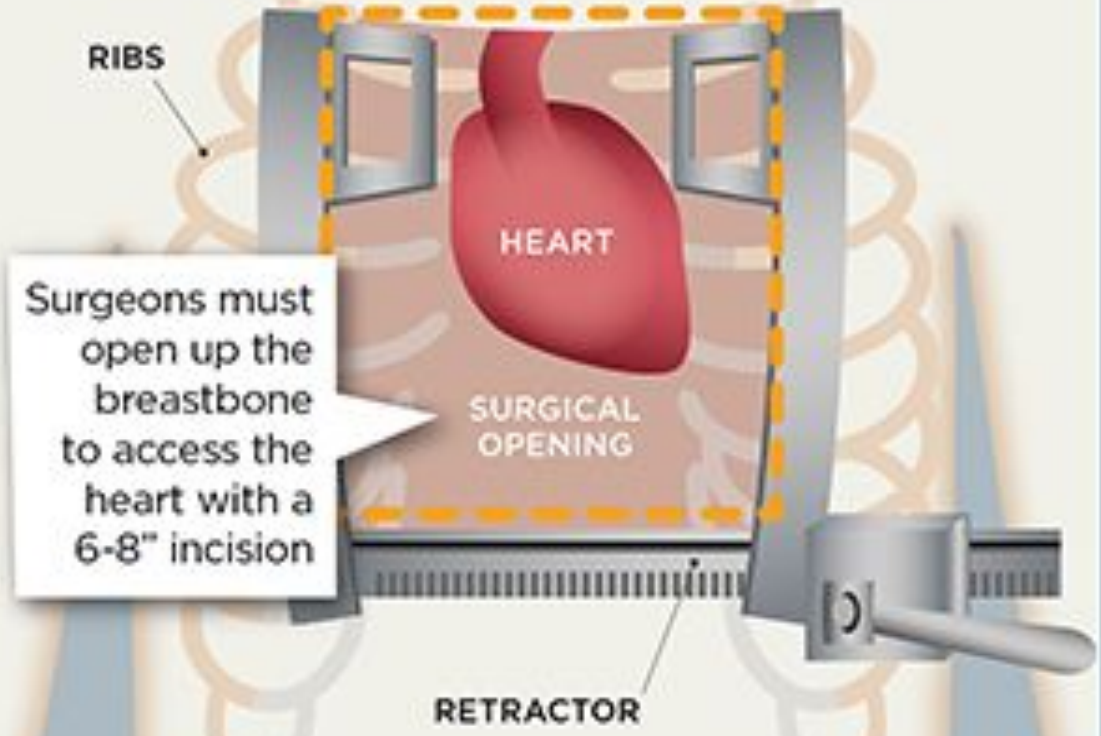
What are the advantages of robotic surgery



- As you can imagine, there are multiple advantages this system from utilizing robotics to perform complex surgical procedures. For example, the very fact that the operation is performed through a small incision means that there will be less trauma and pain to the body, as well as minimal scarring, shorter hospitalization, and a faster recovery period. More on the robotic side, using high-definition 3D cameras leads to greater visualization as surgeons gain close-up views of areas they normally would not be able to see in open surgery. Likewise, the use of fully articulating robotic arms that mimic the movement of hands presents surgeons with enhanced dexterity and greater precision than could ever be possible with conventional surgical instruments.



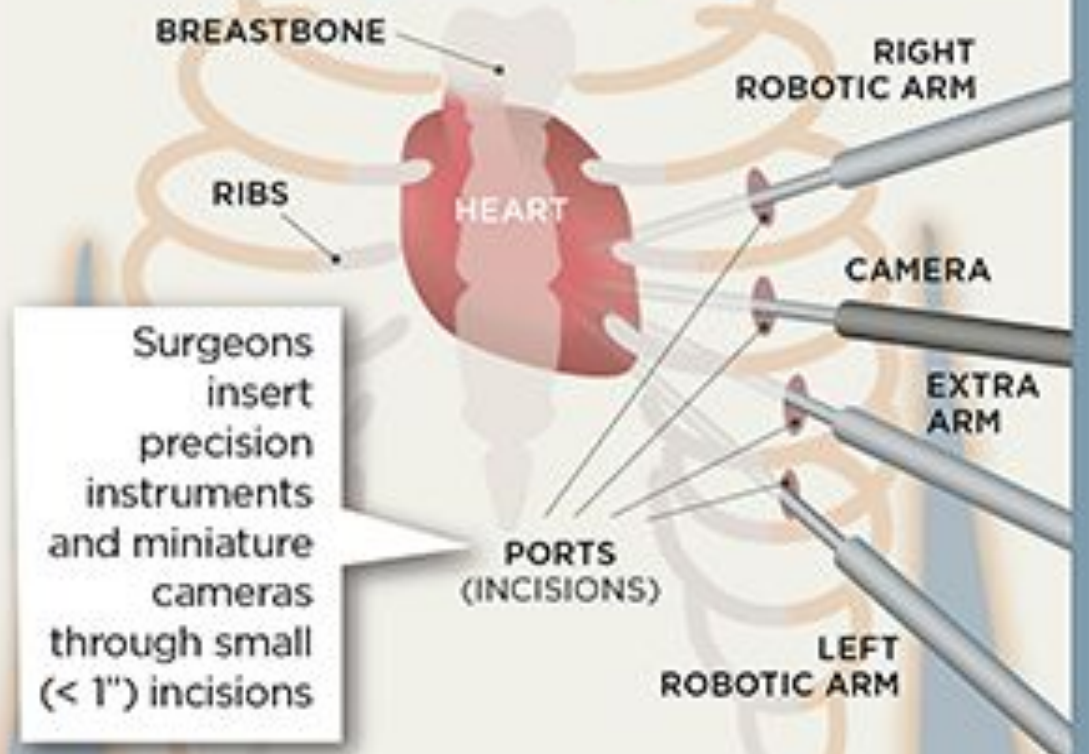
Open Heart Surgery



Surgeons must open up the breastbone to access the heart with a 6-8" incision

Time in hospital:	Time to return to normal activities:
5-7 days	**3-6 months**

Robotic Heart Surgery such as TECAB



Surgeons insert precision instruments and miniature cameras through small (< 1") incisions

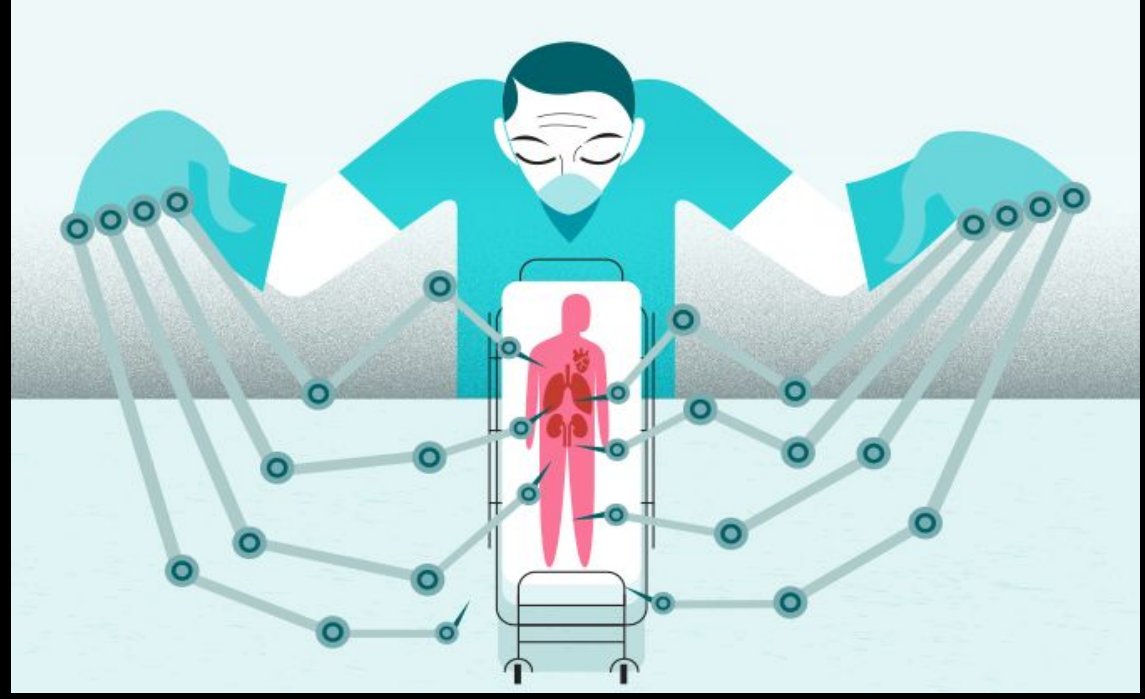
Time in hospital:	Time to return to normal activities:
1-3 days	**2-4 weeks**

DISADVANTAGES OF ROBOTIC SURGERY-

1.) Time:
Robotic assisted heart surgery can take nearly twice the amount that a typical heart surgery takes.

2) Cost:
At this erly stage in the technology , the robotic systems are very expensive.

3) Efficiency and Compatibility:
Current operating room instruments and equipments are not necessarily compatible with the new robotic systems. Thus, there is less efficiency and compatibility with this system.



CURRENT ROLE OF ROBOTICS IN SURGERY-

- Major advances aided by surgical robots have been remote surgery, minimally invasive surgery and unmanned surgery. Due to robotic use, the surgery is done with precision, miniaturization, smaller incisions; decreased blood loss, less pain, and quicker healing time.

WHAT IS THE FUTURE OF ROBOTIC SURGERY?

New surgical robotics systems will be able to perform repetitive tasks with more precision and greater autonomy, freeing up surgeons to focus on more complex aspects of a procedure and make more informed surgical decisions

THANK YOU

FOR YOUR ATTENTION !!

NAME- KISHOR KUMAR
GROUP- 406

SUB.- TOPOGRAPHIC ANATOMY