

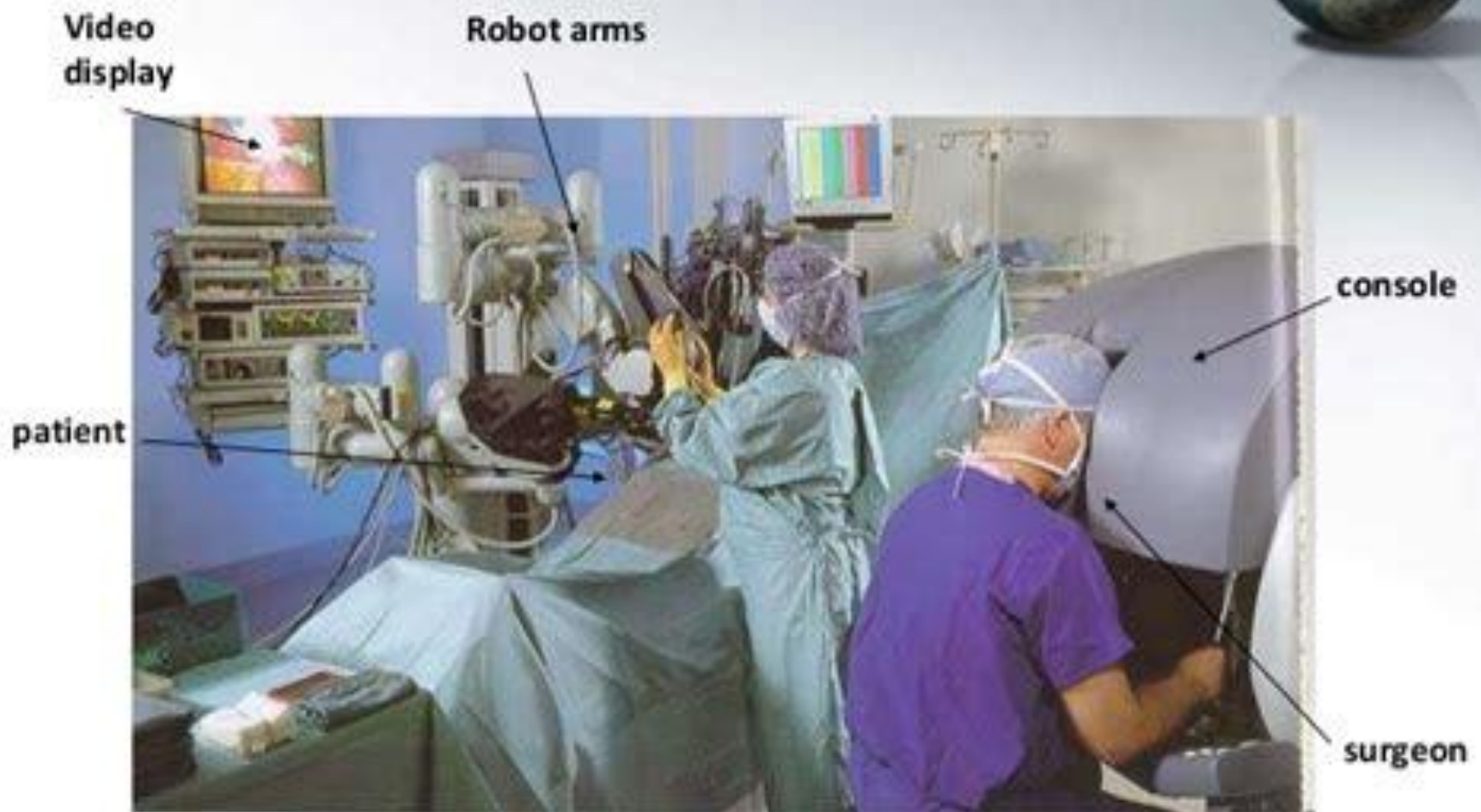


Robot Medicine

Fiction and fact



Da Vinci System



▪ *Da Vinci system is used in :*

- ✓ *Abdominal surgical procedures.*
- ✓ *Prostate cancer surgery.*
- ✓ *Hysterectomy.*
- ✓ *Mitral valve repair.*
- ✓ *Cardiac valve repair.*
- ✓ *Gynecological surgical procedures.*
- ✓ *Thoracic Surgical procedures.*



The Robotic Arms (patient side)



The da Vinci System consists of four interactive robotic arms controlled from the console.



da Vinci Robot



ROBOTIC SURGEONS

- The first generation of surgical robots are already being installed in a number of operating rooms around the world.
- These machines still require a human surgeon to operate them and input instructions.
- Remote control and voice activation are the methods by which these surgical robots are controlled.
- According to one manufacturer, robotic devices could be used in more than 3.5 million medical procedures per year in the United States alone.



APPLICATIONS

- Cardiac surgery
- Gastrointestinal surgery
- Gynecology
- Neurosurgery
- Orthopedics
- Pediatrics
- Radio surgery
- Urology



What is robotic surgery??

- ▣ Surgeon controls movement through robotic arms
- ▣ One arm controls the camera and scopes
- ▣ The other arms control robotic surgical instruments
- ▣ Trocars are inserted through tiny incisions
- ▣ Can be used for:
 1. Cardiac surgery
 2. Gynecologic and Urologic surgery
 3. Weight loss surgery



Robotic Surgery vs. Traditional Methods

ROBOTIC SURGERY

- Greater dexterity, precision, and control
- Three dimensional view
- Better camera stability
- Improved ergonomics

TRADITIONAL/ LAPAROSCOPIC SURGERY

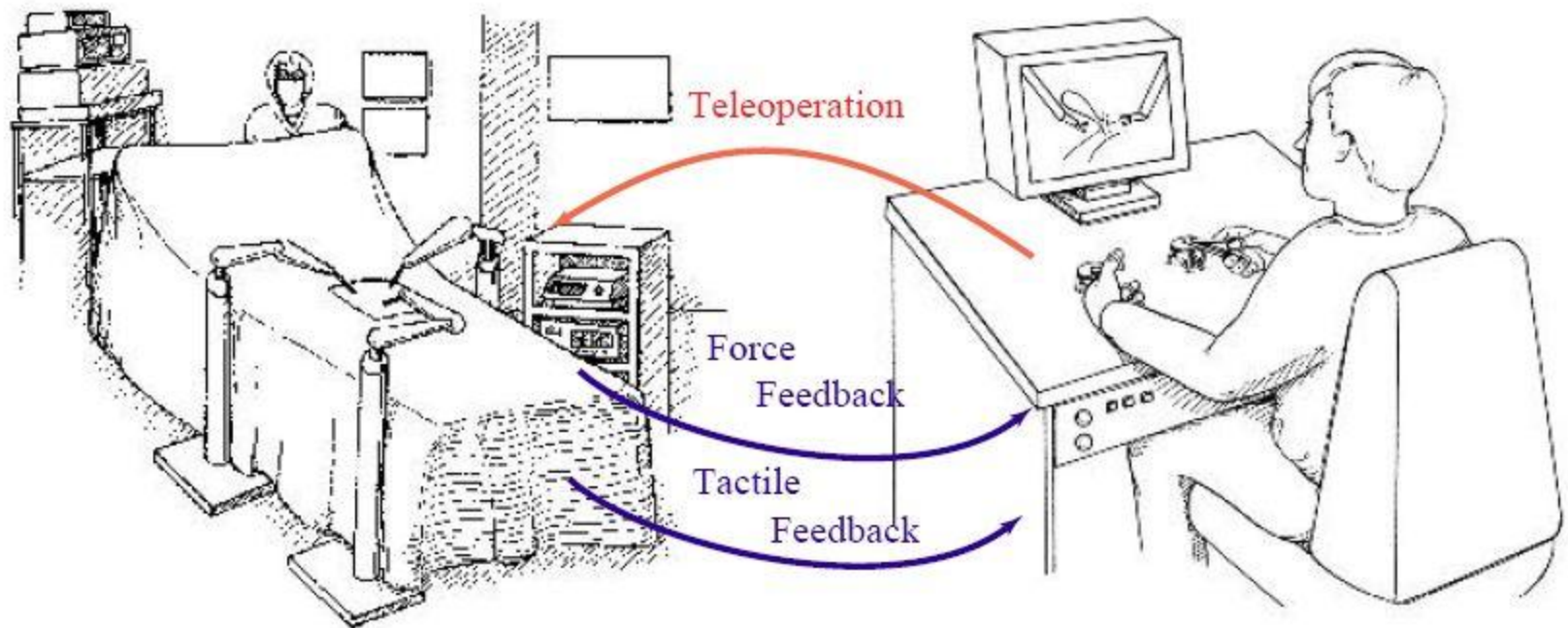
- Limited dexterity, precision, and control
- Two dimensional view
- Camera instability
- Poor ergonomics



Tabor (2007)

Design of Robotic Telesurgery(3)

- The Concept

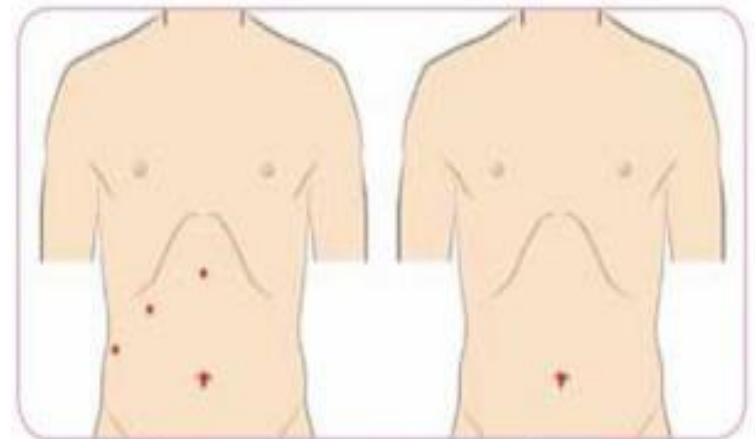


- Telesurgical system concept



Scarless Robotic Surgery

This procedure is performed through a single incision using state-of-the-art precision instruments. Patients who choose Single-Site da Vinci Surgery experience a virtually scarless procedure since surgery is performed through only one incision in the navel (belly button), which dramatically limits visible scarring.



Multi-incision
Laparoscopy

Single-Site™
da Vinci Surgery

Robotic Surgical Simulator

- Stand-alone surgical simulator
- No consumables or disposables required
- Allows performance analysis and measurement
- User does not require monitoring
- New surgical procedure modules can be added
- Does not require an operating room environment and can be set up in a location most advantageous to access and training needs
- Monitor allows a user or tutor to observe the procedure
- Comprehensive curriculum to train for motor, and cognitive skills









