Robot Medicine

Fiction and fact

Da Vinci System

- *Da Vinci system is used in :*
  - ✓ *Abdominal surgical procedures.*
  - ✓ *Prostrate 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 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

Tabor (2007)

Robotic Surgery vs. Traditional Methods

ROBOTIC SURGERY

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

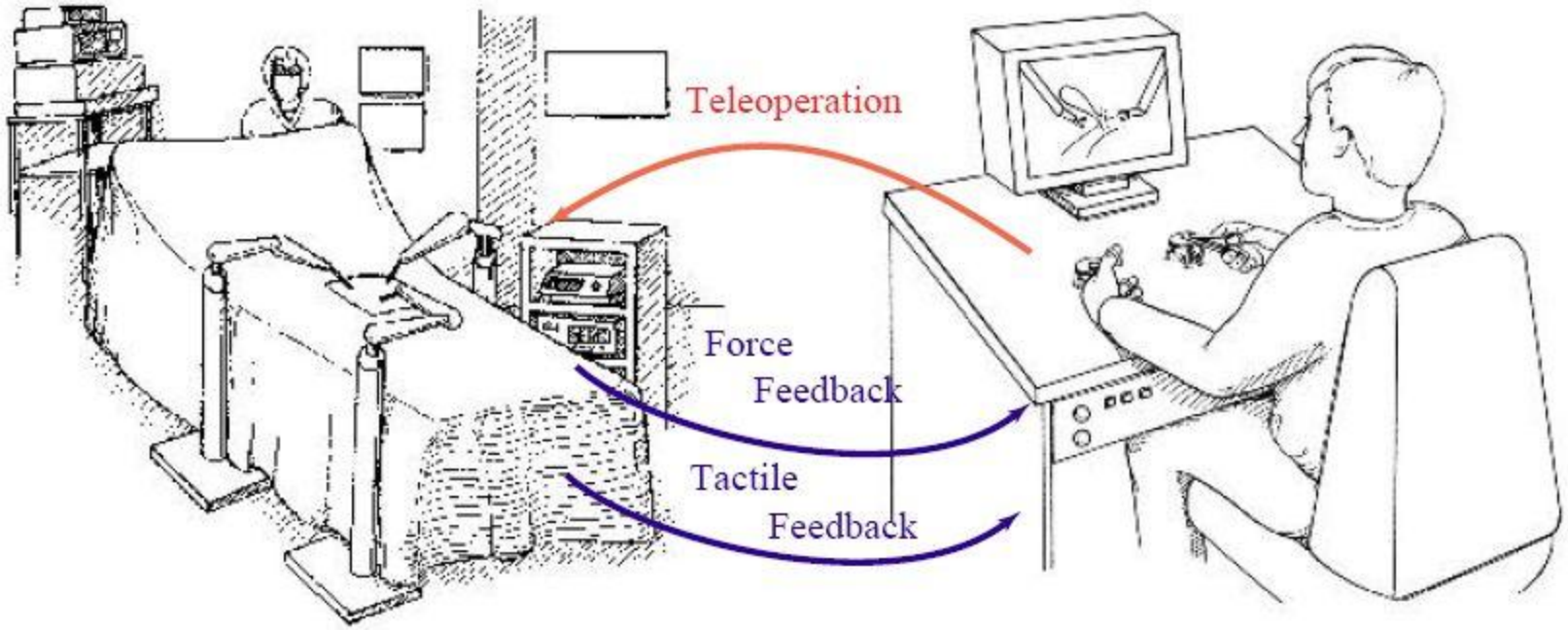
TRADITIONAL/ LAPAROSCOPIC SURGERY

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

Tabor (2007)

Design of Robotic Telesurgery(3)

- The Concept

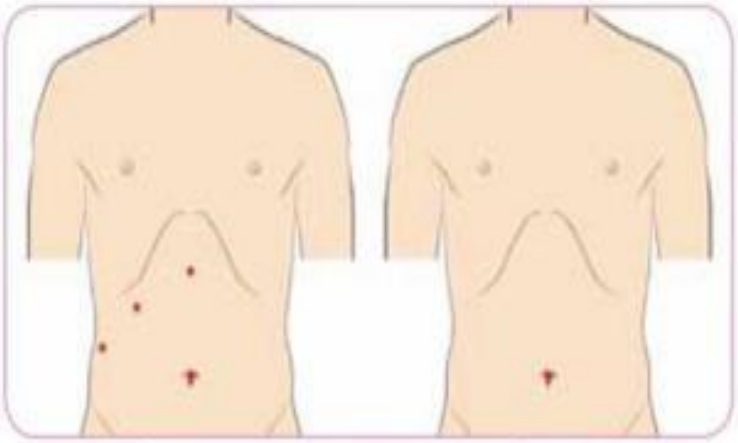


- Telesurgical system concept

slimlifesolutions

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

www.joelhustak.com


1
2
3
4