

Ergonomics Is A Laparoscopic Tool

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The problem

- ❑ Laparoscopy is not accepted as hoped
- ❑ “High technicality and low productivity”

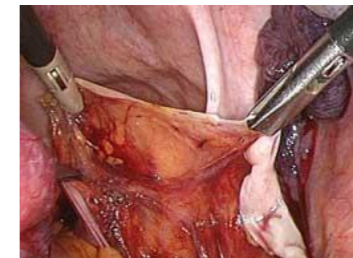


- ❑ Working faster is not enough

The Solution-

A Different State of Mind

- ❑ Laparoscopy is not just another surgical route
- ❑ Laparoscopy is virtual:
 - ❑ Inconvenients:
 - ❑ Blind behind the lens, Fragile vision, Lack of third dimension, Precise but small area
 - ❑ Advantages/tools:
 - ❑ Information selection
 - ❑ Constant eye/instrument/tissue distance

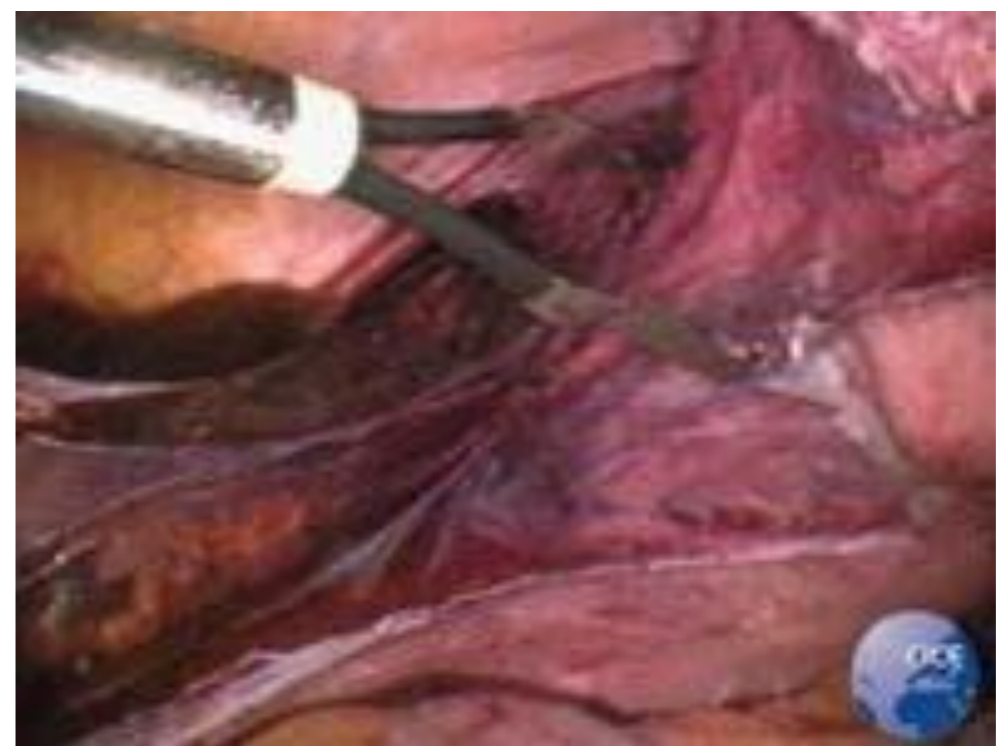


The Solution- Basic Rules

- Select the information**
- Never stop looking at the screen while situation is not stable**

Select the information

All the required information and none that is not necessary should be in sight.



Never stop looking at the screen while situation is not stable

- Operating field organization
- Surgical Strategy
- Instruments

Operating field organization

Peripheral field must be arranged properly:



Instruments

- ❑ Fixed place
- ❑ Arranged by priority
- ❑ Extra instruments in hand
- ❑ The scrubbed nurse
- ❑ Multifunctional



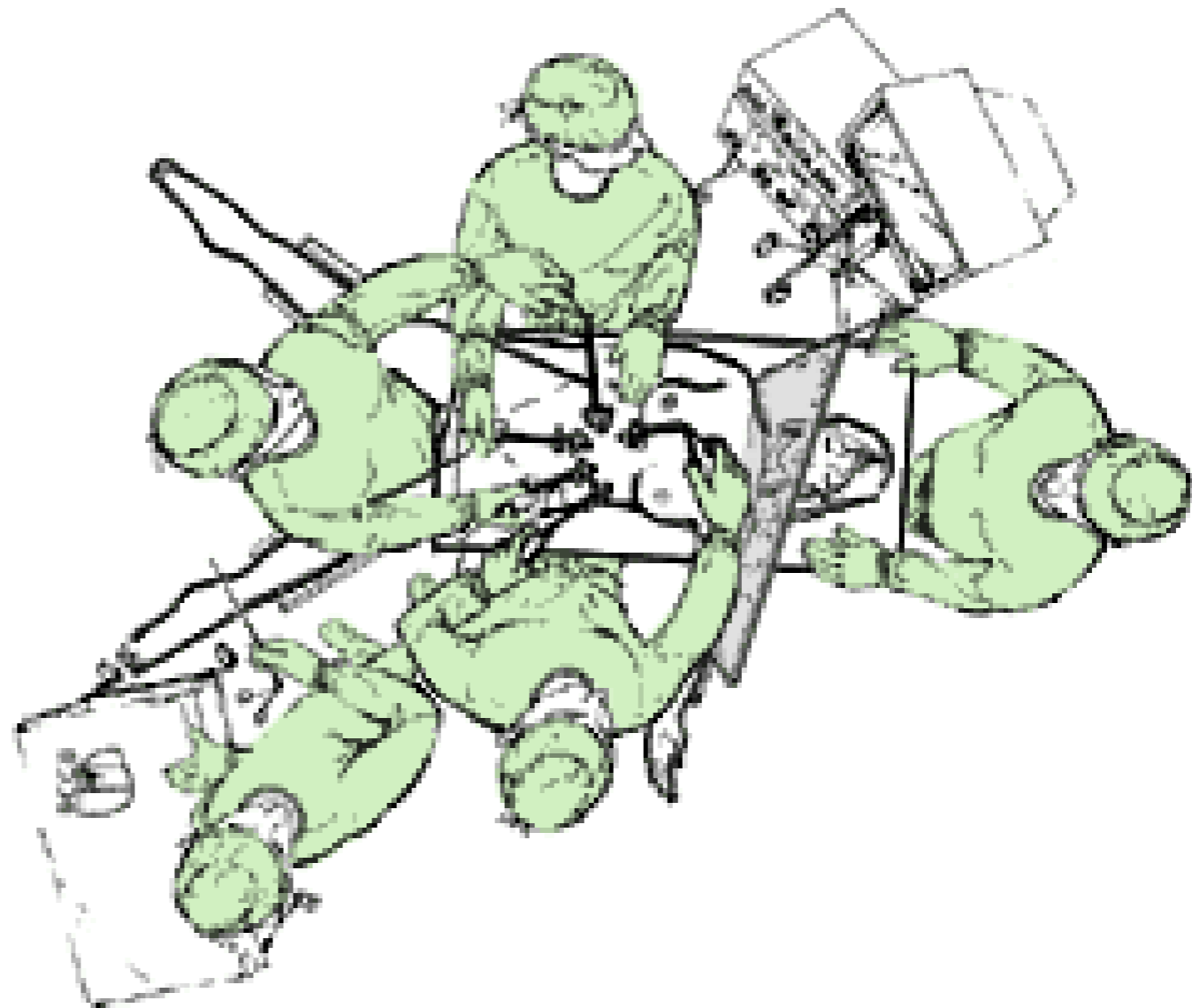
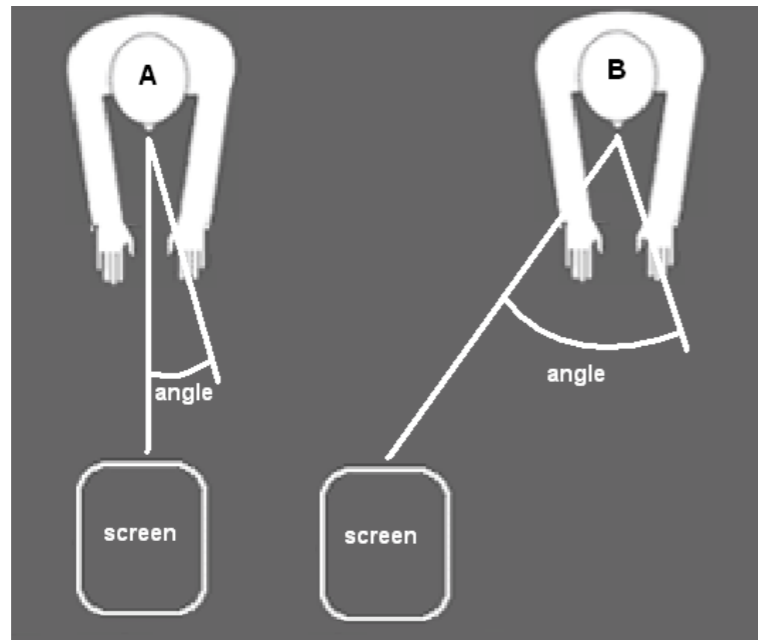
Screens

- **Location, Hight, Distance**

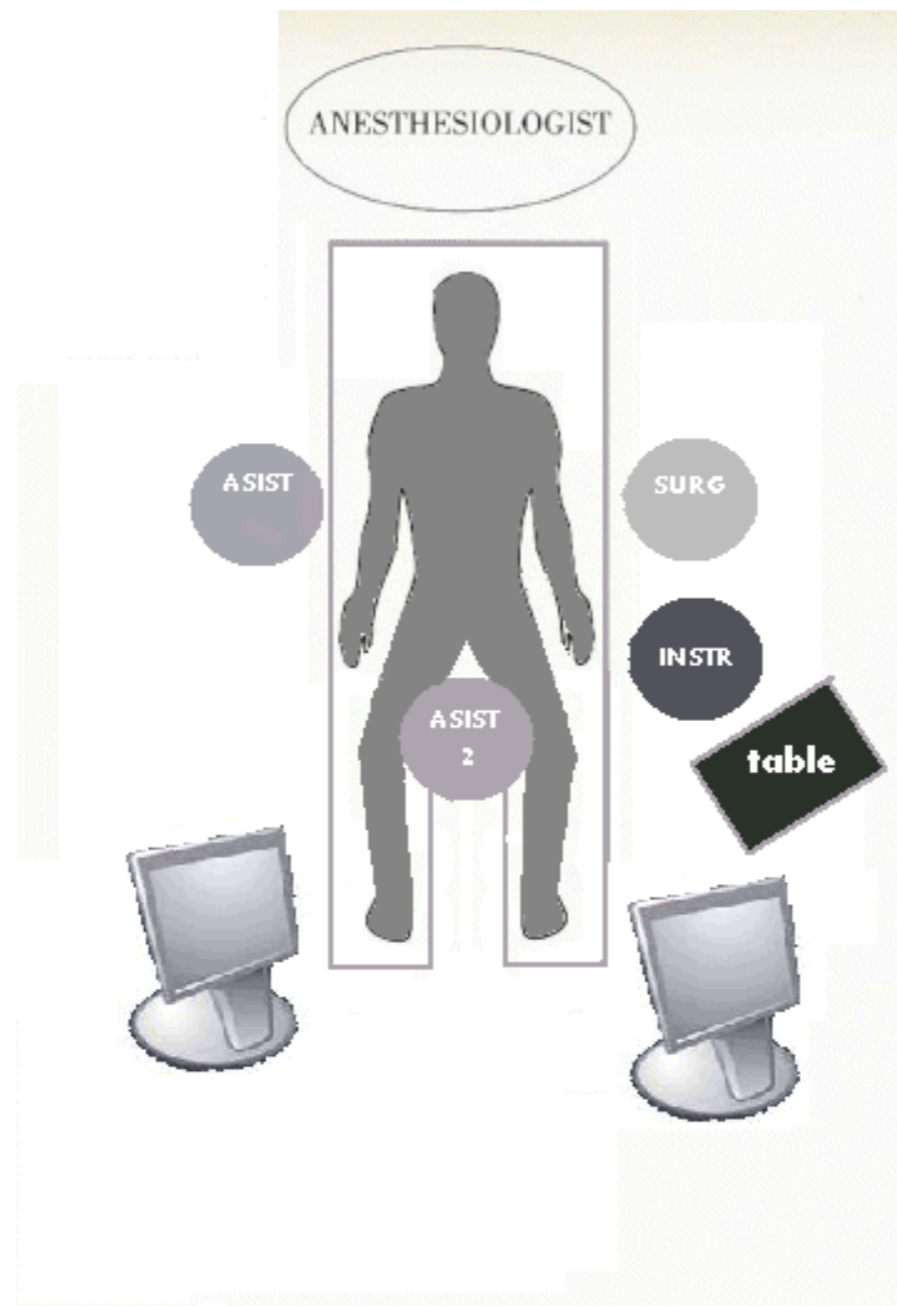


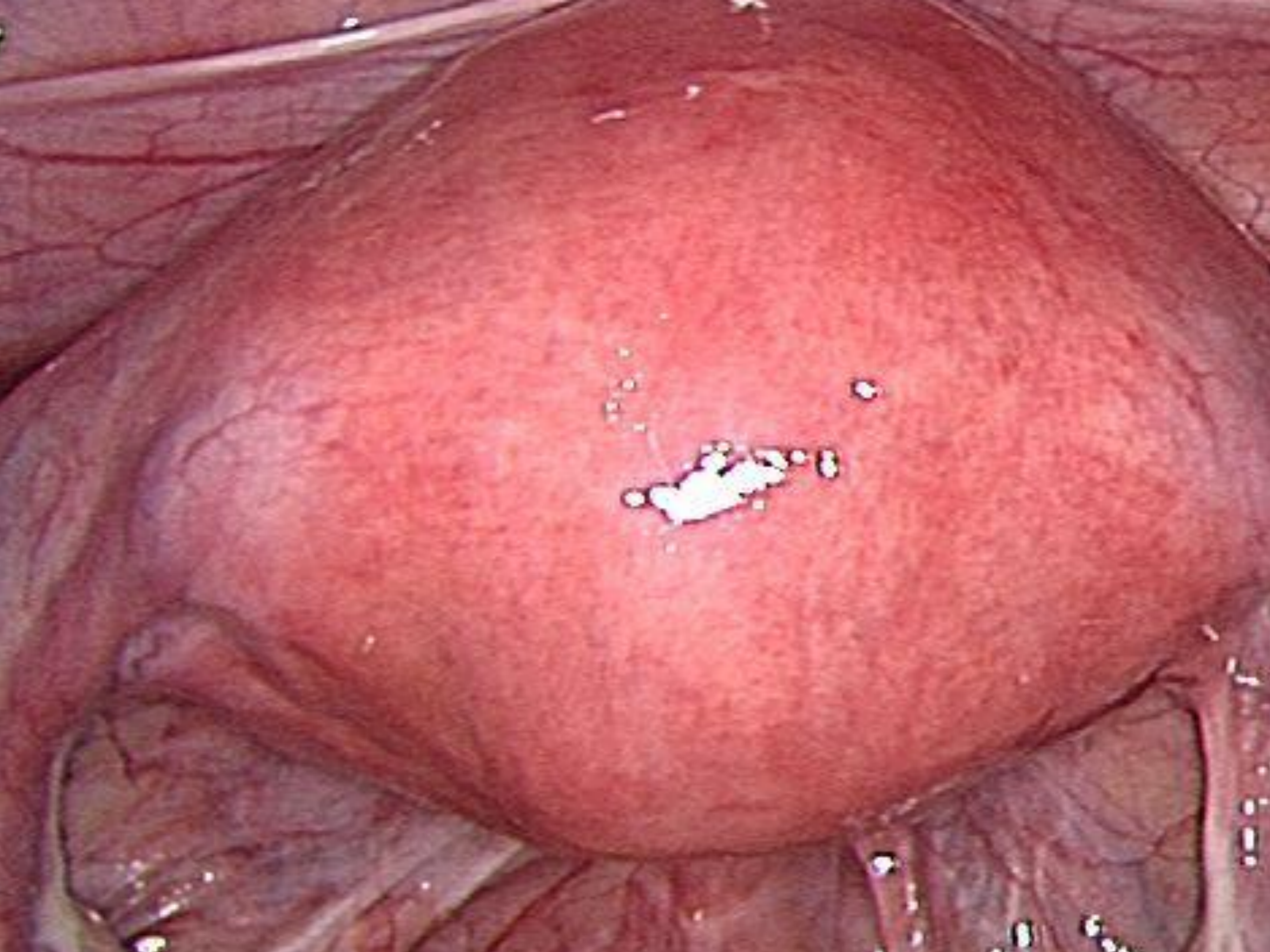
screens

- ❑ Distance $0.6 < x < 6$
- ❑ Axis of work
- ❑ Size & Quality

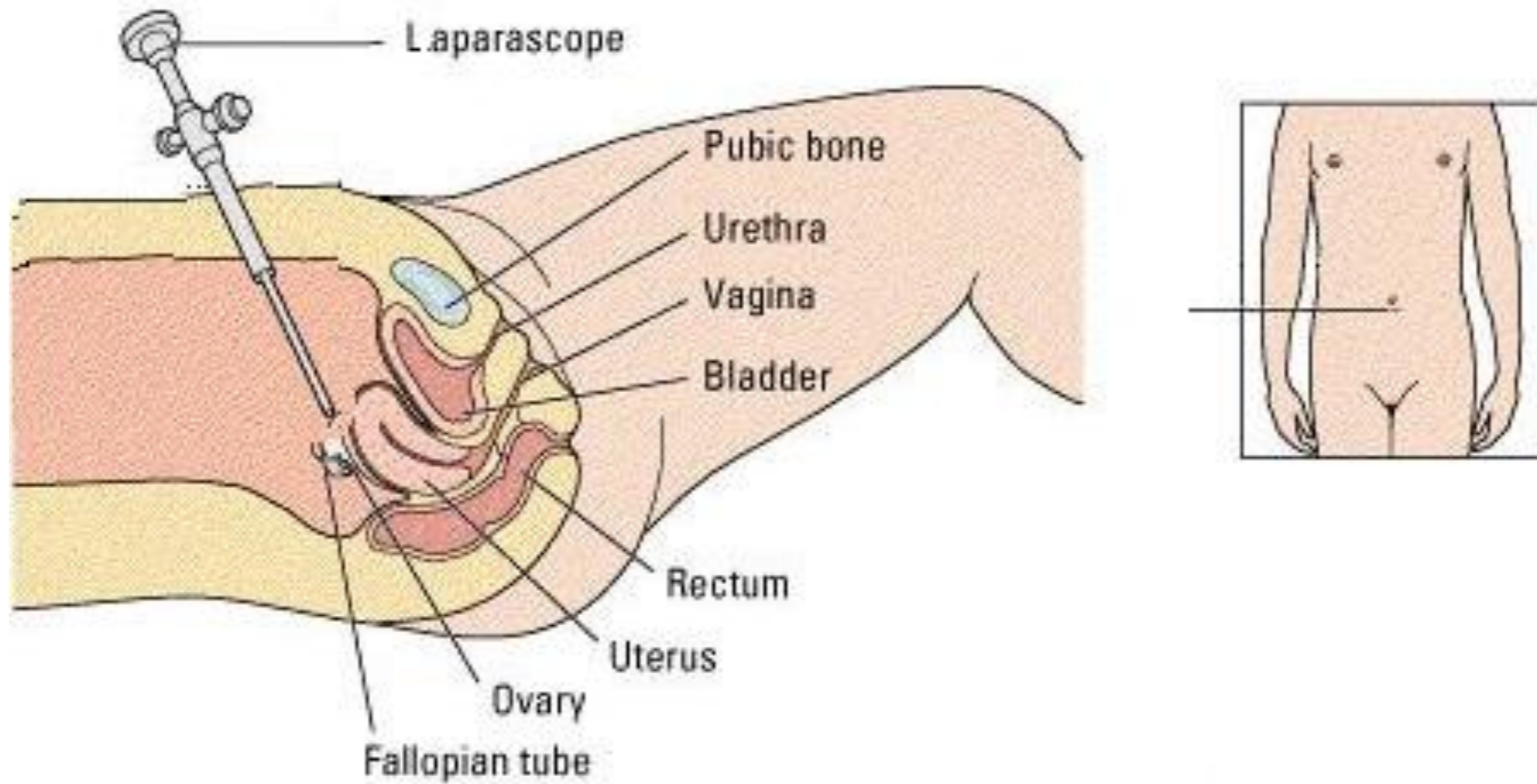


Our setup

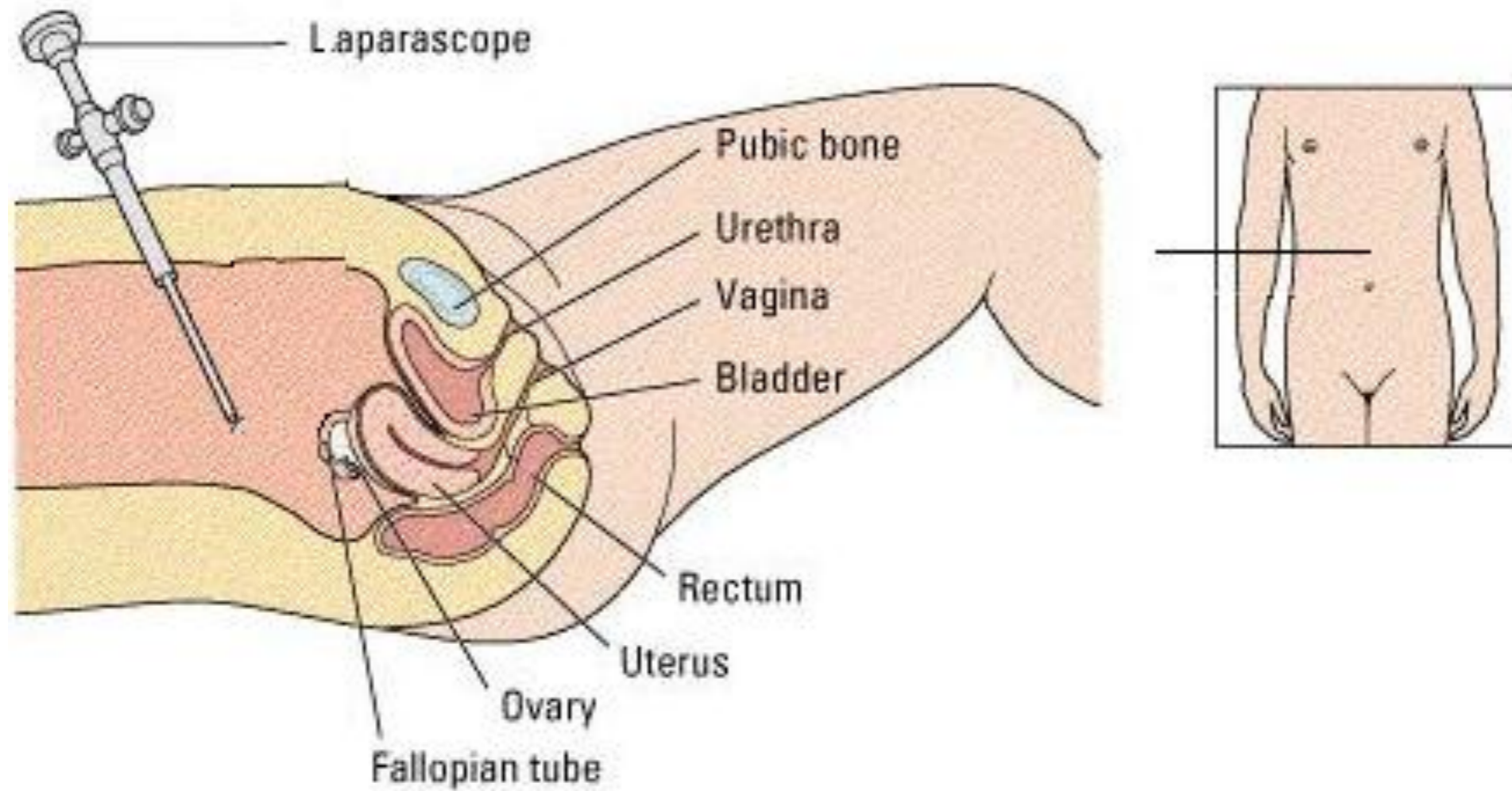


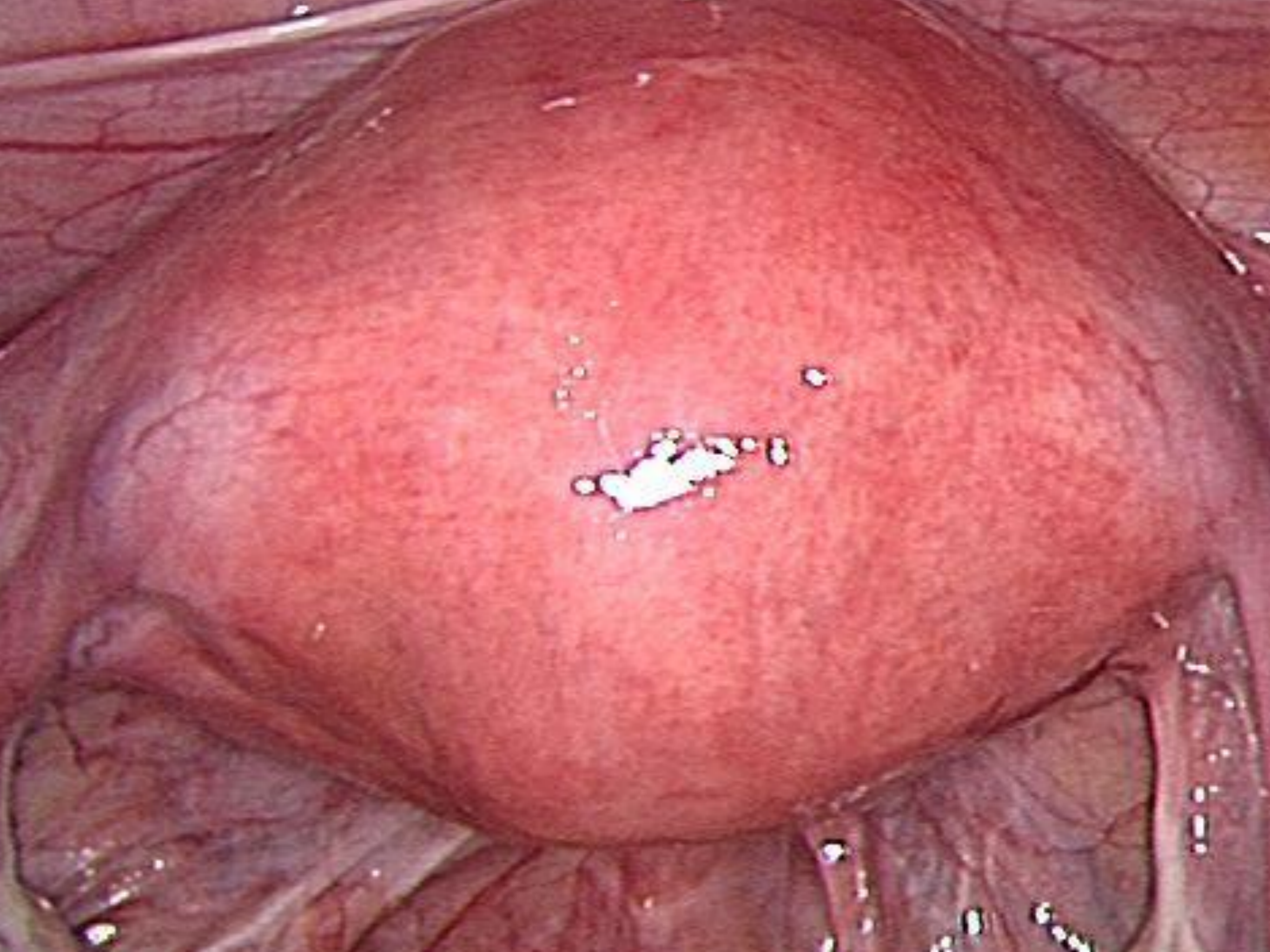


Optic Trocar



Optic Trocar



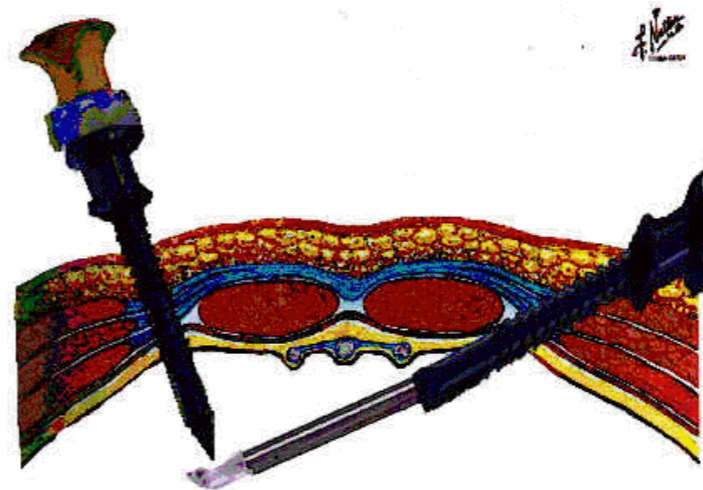


Operating trocars

- Placement:
- Class I lever

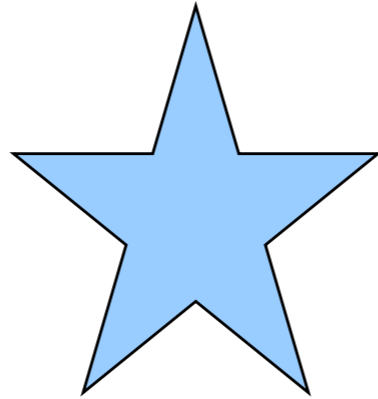


- Insertion

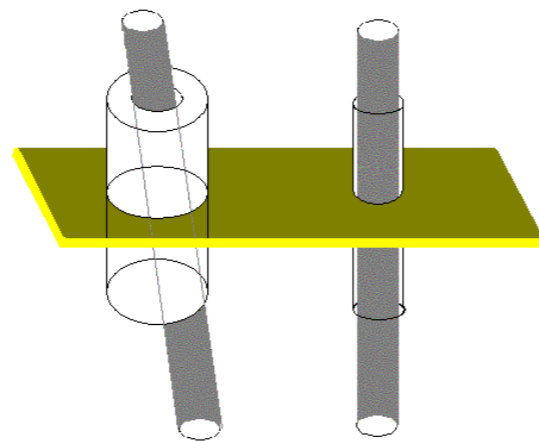


Operating trocars

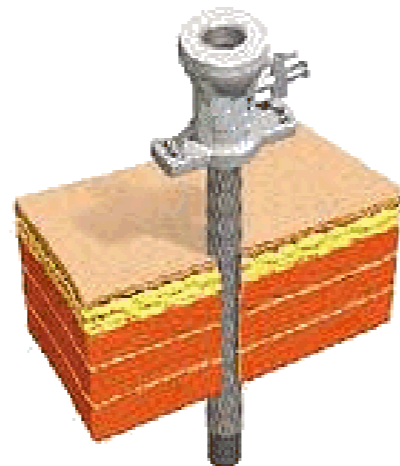
Type



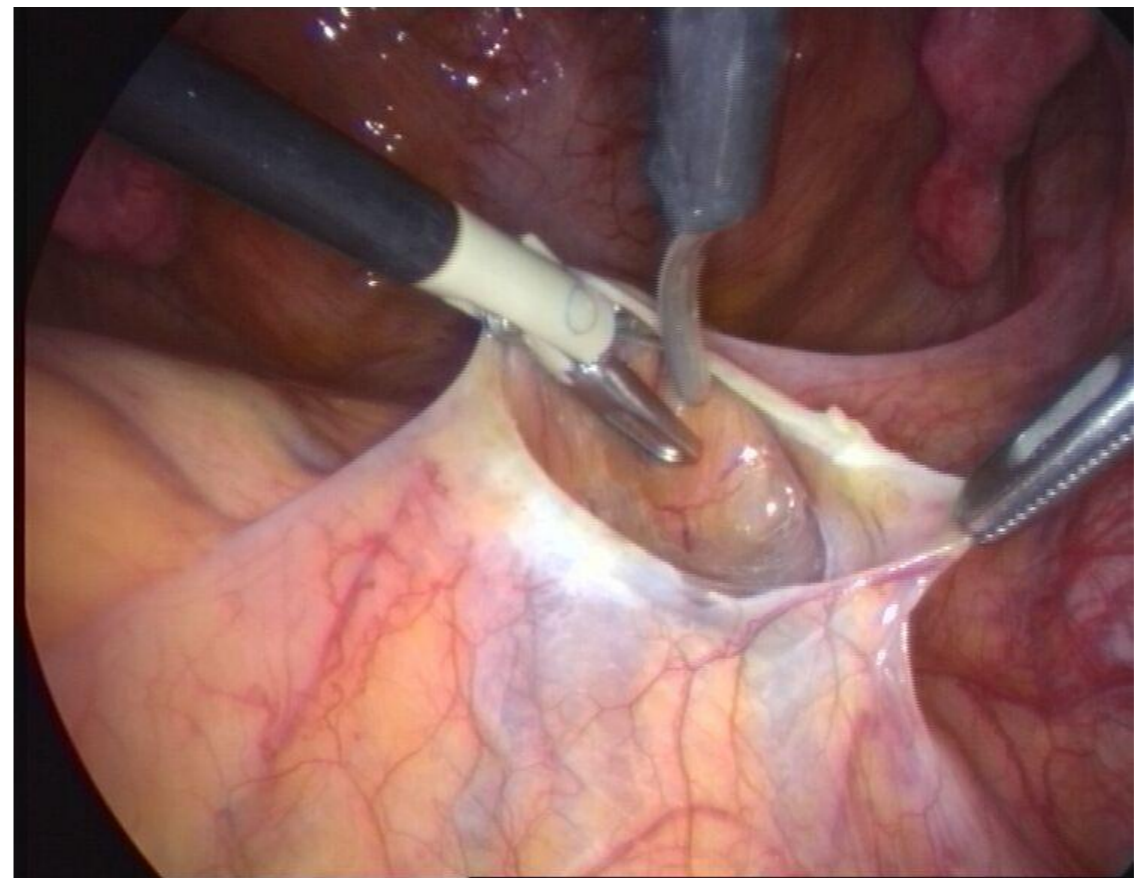
Size



Orientation



Multifunctional Instruments



Operator's ergonomics and convenience

- ❑ Long surgical interventions → Weary muscles slow work and errors.
- ❑ Muscles can work for hours, if using 15% of their maximal muscle strength, they will, however tire out, if they use more power.
- ❑ In a recent study, we have shown that highly trained surgeons, aware of surgical ergonomics, use about 15% of the arm's and shoulder's muscle strength, while less experienced surgeons use a much higher percentage of their muscle strength.

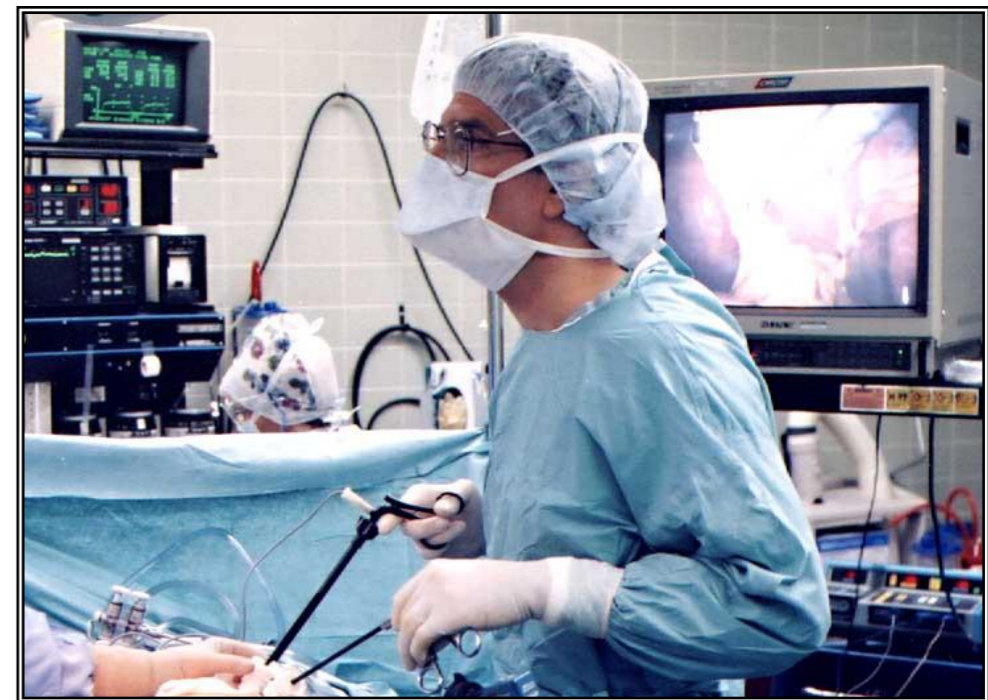
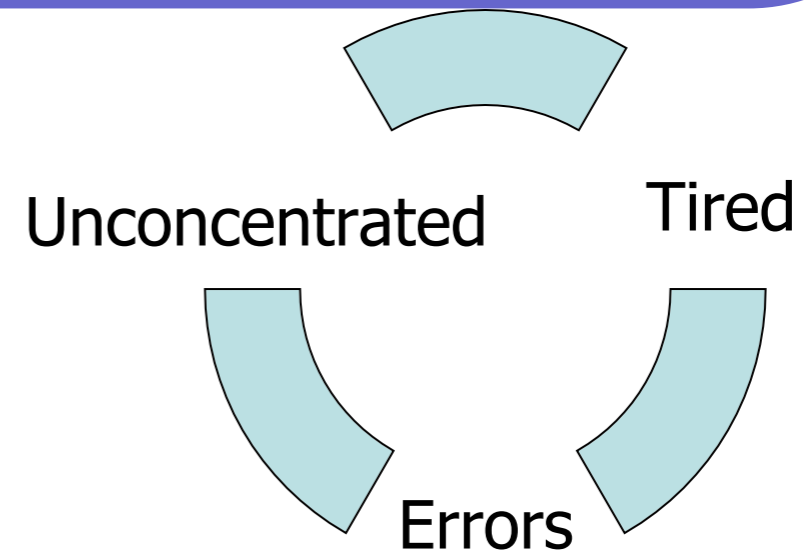
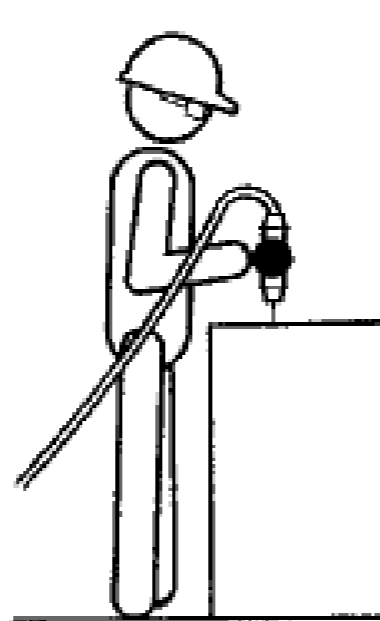
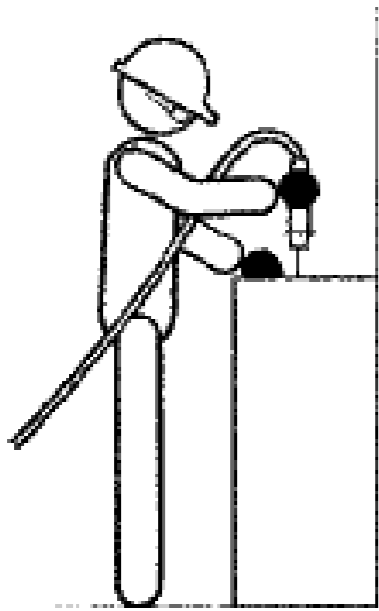


Table height



Surgical Strategy

- Strict homeostasis is mandatory**
- Do not irrigate (use only suction)**
- Rules of optics must be obeyed**
- Retraction restriction**

Operative time can be reduced

Years	1996-1999	1989-1995
Number	952	695
Operative time (Range)	40-180	40-270
Operative time (Mean)	90	115