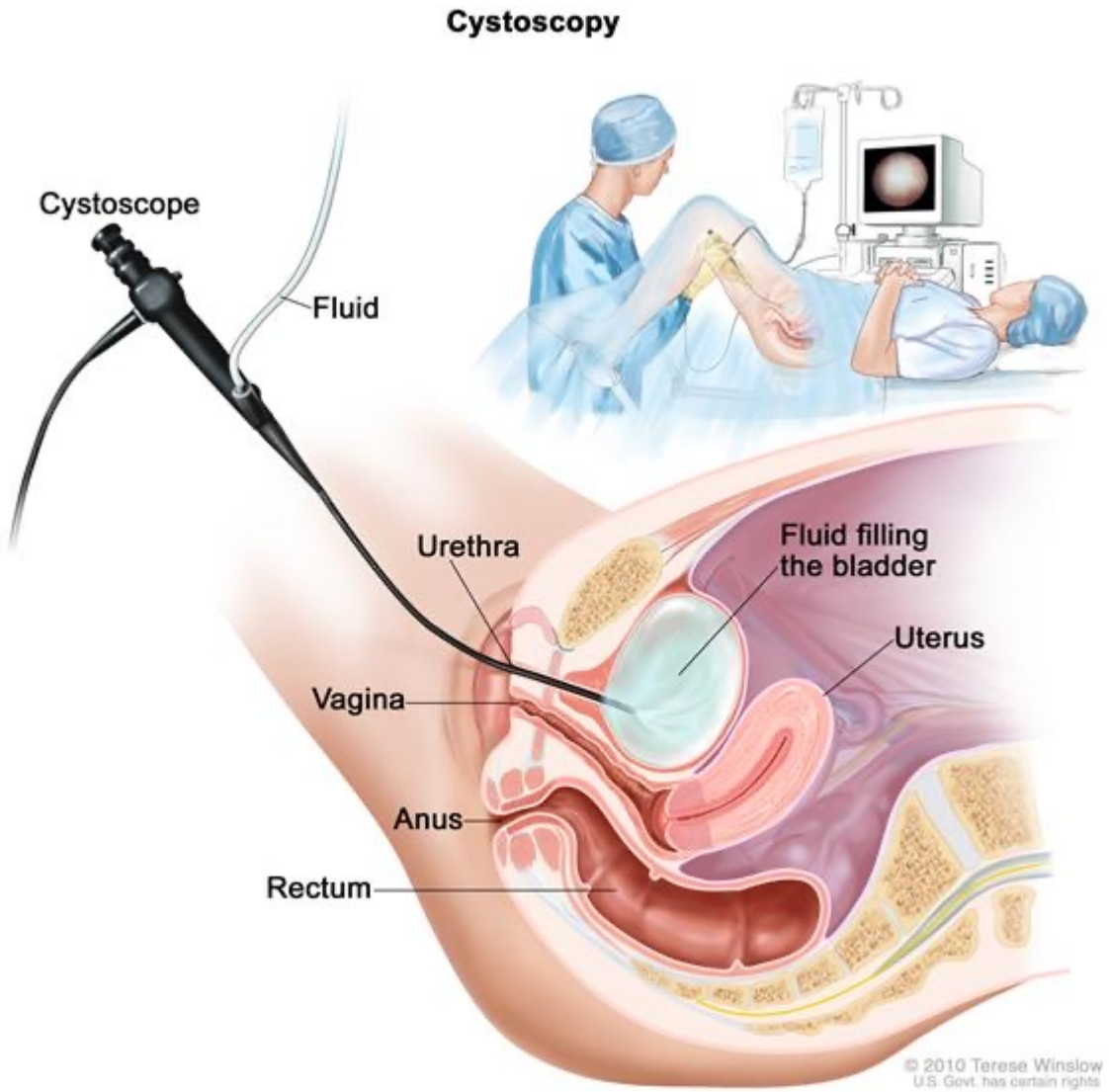
Urinary Preparatory Techniques

Samreung Rangdaeng MD, FIAC

Type of cytologic samples

- **Void urine**
- **Catheterized urine**
- **Instrumented samples**
  - Cystoscopic urine
  - Bladder washing
  - Renal or ureteric washing
  - Post-cystoscopy urine
- **Ileal conduit**
- **Retrograde brushing**


Cystoscopy
Cystoscope
Fluid
Urethra
Fluid filling the bladder
Uterus
Vagina
Anus
Rectum
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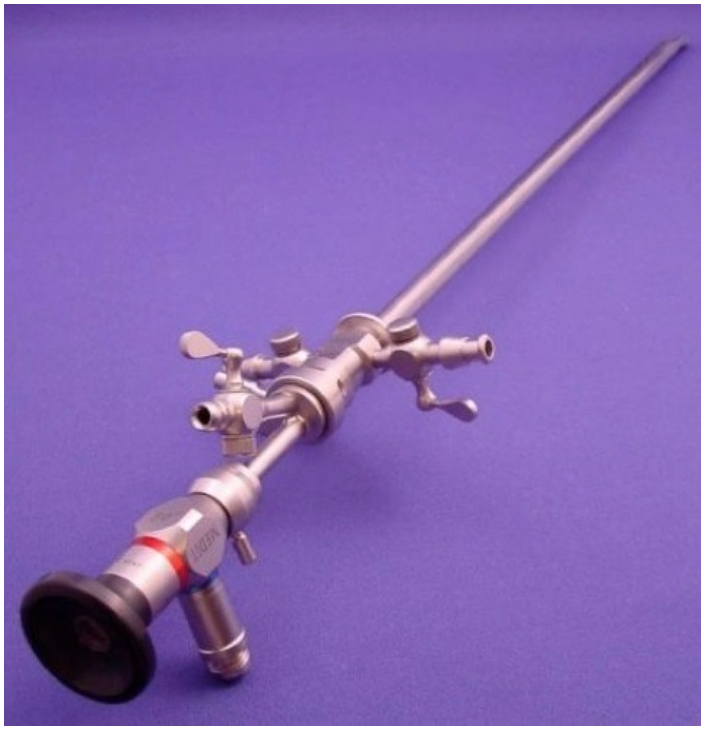

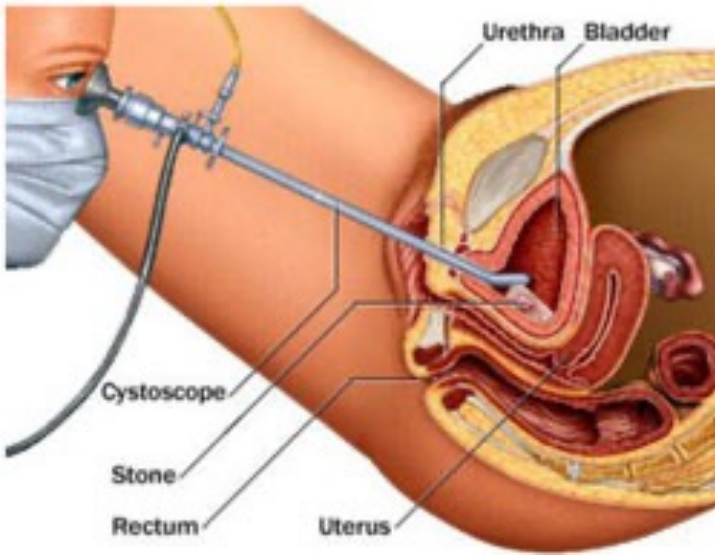
Urethra
Bladder
Cystoscope
Stone
Rectum
Uterus

Factors influencing success

- **Volume –** at least 30 mL
- **Appearance –** *clear, cloudy, hemorrhagic*
- **Appropriate techniques**

Adequacy

- Factors that influent adequacy:
  - Collection type
  - Cellularity
  - Volume
  - Cytomorphological findings
- Not consider preparatory methods
- Clear correlation between low-volume specimens and the lack of malignant diagnoses
- At least 30 mL is necessary to ensure benign

VandenBussche CJ, et al. Cancer Cytopathol 2016;124:174-80

Voided urine

- Random (not early morning) clean catch specimen is recommended to limit cellular degeneration
- Tend to be of low cellularity except 4 conditions:
  - A high-grade urothelial carcinoma
  - An irritative lesion such as lithiasis
  - An infectious process
  - Contaminated urine – woman (non urinary tract cells)
- Superior to instrumented urine in detecting **urethral cancer**

General instruction: Void Urine

- Random voided urine, 50 to 100 ml about 3-4 hours after last urination
- First morning urine is not recommended due to degeneration
- Should be delivered to the lab as soon as possible
- Refrigerated if delay but not exceed 24 hours
- No fixative need if fresh submission is possible

Instrumented Urine

Superior to void urine in detecting malignancies of bladder and upper tract
Catheterized urine in UT infections, Determining cause of hematuria, Patients in-dwelling catheters
Washing is the most sensitive method for cancer detection, examining large area
Brushing performed under cystoscopy and sample specific area

Sample preparation

01 Liquid-based preparation

02 Cytocentrifuge

03 Filter preparation

04 Cell block

Never do centrifuge and direct smear

Optimizes cell preservation

Standardizes specimen preparation

Simplifies slide screening

Offers the versatility to perform ancillary testing

Benefit of Liquid based Cytology

Routine Urine Cytology: LBC preparation

1. Sample collection
2. Concentrate by centrifugation
3. Pour off supernatant and vortex
4. Add 30 ml of lysis solution. Repeat centrifugation, pour off supernatant.
5. Evaluate cell pellet. If cell pellet is not free of blood, do a second lysis wash
6. Add recommended # of drops of specimen to Preservative Vial
7. Allow to stand for 15 to 30 minutes
8. Prepare slide on LBC processor
9. Fix, Stain, and Evaluate

Cytocentrifuge preparation

- Use about 30 ml of urine and centrifuge at 2000 rpm for 10 minutes
- Decant supernatant, if the pellet appear hemorrhagic, resuspend in hemolysis solution and stand for 10 minutes
- Re-centrifuge at 2000 rpm for 10 minutes. Hemolytic process can be repeated if need.
- Resuspend it in about 2-5 mL of normal saline or PBS (adjust turbidity or cell count)
- Add 1-2 mL of suspension into each of four small-chamber funnels
- Cytocentrifuge at 900-1200 rpm for 3-5 minutes
- Following remove glass slides from chamber, immediately fix in 95% ethanol

Thank You

For

Your Attention