

URINE COLLECTION

IN URINARY TRACT INFECTIONS

a scientific approach

Dr.T.V.Rao MD



Why Collection of Urine Makes Difference in Optimal Diagnosis of Urinary Tract Infection

Urine being the Common specimen processed in the Microbiology Laboratories, often the matters are left to inexperienced staff leading to many specimens contaminated, with normal flora leading to errors in Diagnosis, I wish the scientific approaches in collection makes a difference in optimal diagnosis and effective care of patients. The True principle in Medicine TIME lost in early diagnosis in Infectious diseases can be never gained

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Why Proper collection of Specimens

- **Proper collection of specimens is important to maximize the outcome of laboratory tests for the diagnosis of infectious diseases**
- **A variety of laboratory tests can be performed to make a presumptive or definitive diagnosis so that therapy can begin.**

Types Of Urine Collection

- Laboratory urine specimens are classified by the type of collection conducted or by the collection procedure used to obtain the specimen.



Urine Collection Products

- **Urine Collection Containers (cups for collection and transport)** Urine collection container cups come in a variety of shapes and sizes with lids that are either snap on or screw on. To protect healthcare personnel from exposure to the specimen and protect the specimen from exposure to contaminants, leak-resistant cups should be utilized.



Urinary Tract Specimens

- **First-voided** morning urine optimal (generally bacteria have been proliferating in bladder urine for several hours)
- Midstream urine specimens, and ideal specimen (**initially voided urine contains urethral commensals**)
- Indwelling catheters (freshly placed, urine aspirated by needle inserted into catheter) (Foley catheter tips not acceptable)
- Straight catheter specimens
- Suprapubic aspirates (infants or children, recovery of anaerobes)
Cystoscopic collection of urine

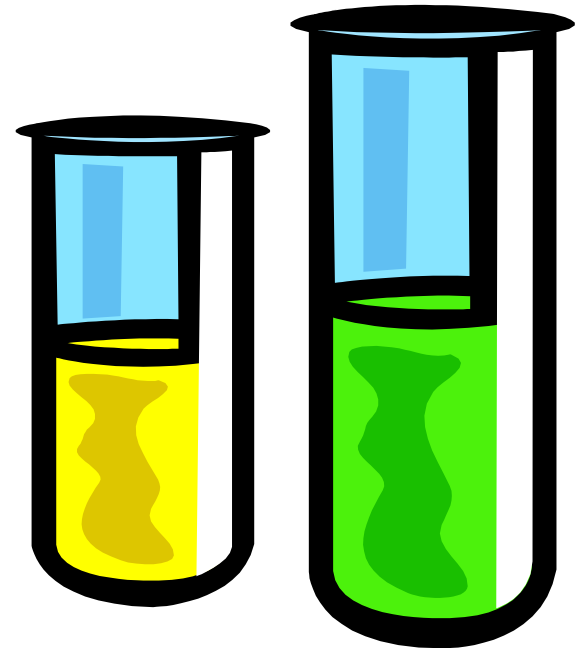
Contamination-free specimen

Specimens Types

Varies in method used and in time frame in which to collect specimen

Types of specimens:

- Random
- First morning**
- Clean catch midstream**
- Timed
- 24 hour



Specimens Types (cont.)

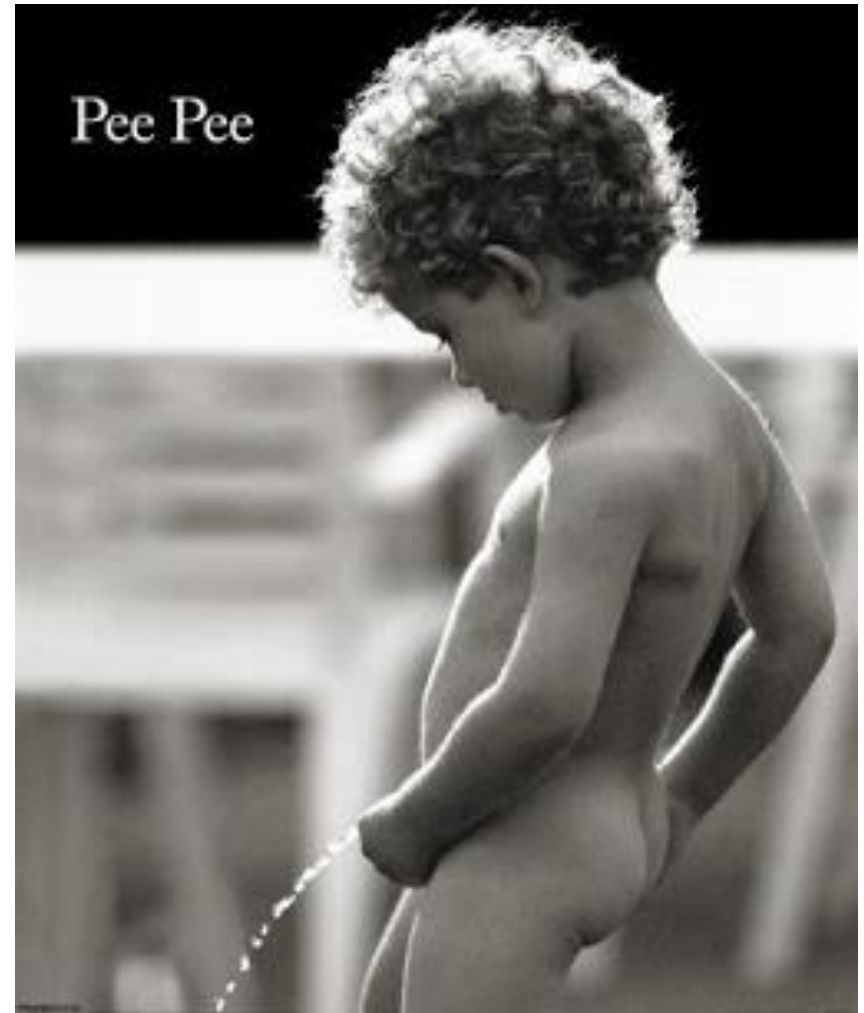
- Random – most common, taken anytime of day
- First morning – has a greater concentration of substances, taken in morning
- Clean catch midstream – genitalia is cleaned, urine is tested for microorganisms or presence of infection**
- Timed – specific time of day, always discard first specimen before timing
- 24 hour – used for quantitative and qualitative analysis of substances

Urine collection process

- A sterile pre-labelled urine collection cup to the subject and explain the following before the urine collection:
- First, hands should be washed with soap and water.
- The collection cup should not be opened until just before urinating.
- The cap should be turned up while urinating, and then immediately recap the filled container tightly.
- It is most important that the inside of the container and the cap not be touched or come into contact with any parts of the body, clothing, or external surfaces. Exposure to air should be minimized.

Types Of Urine Collection

- **The patient should then void the first portion of the urine stream into the toilet. These first steps significantly reduce the opportunities for contaminants to enter into the urine stream.**

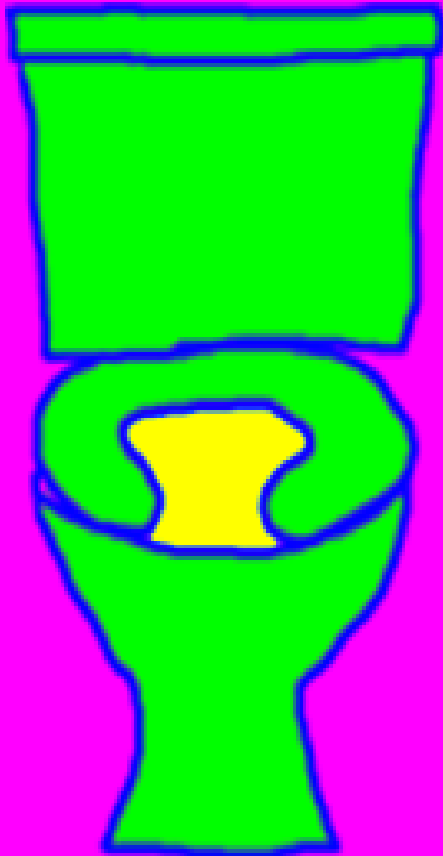


Types Of Urine Collection

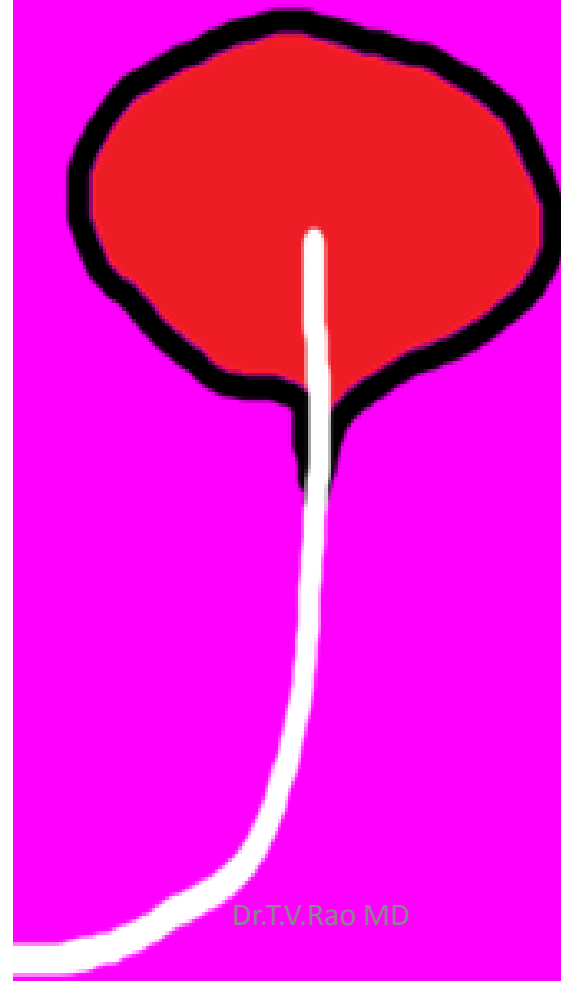
- **Random Specimen** This is the specimen most commonly sent to the laboratory for analysis, primarily because it is the easiest to obtain and is readily available. This specimen is usually submitted for urinalysis and microscopic analysis, although it is not the specimen of choice for either of these tests.

Major Methods in Urine Collection

Voided

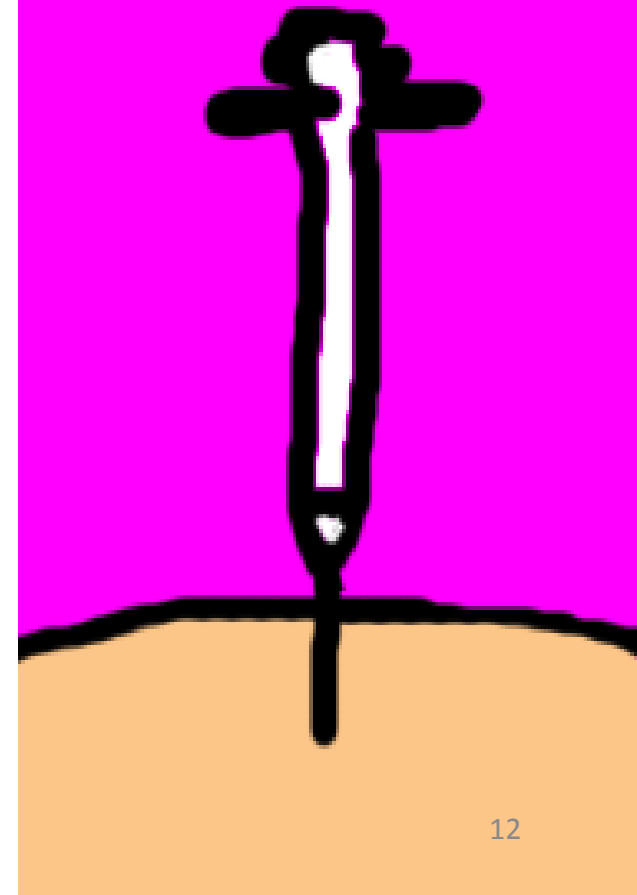


Transurethral



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Suprapubic



Types Of Urine Collection

- **First Morning Specimen** This is the specimen of choice for urinalysis and microscopic analysis, since the urine is generally more concentrated (due to the length of time the urine is allowed to remain in the bladder) and, therefore, contains relatively higher levels of cellular elements and analyses such as protein, if present .

Types Of Urine Collection

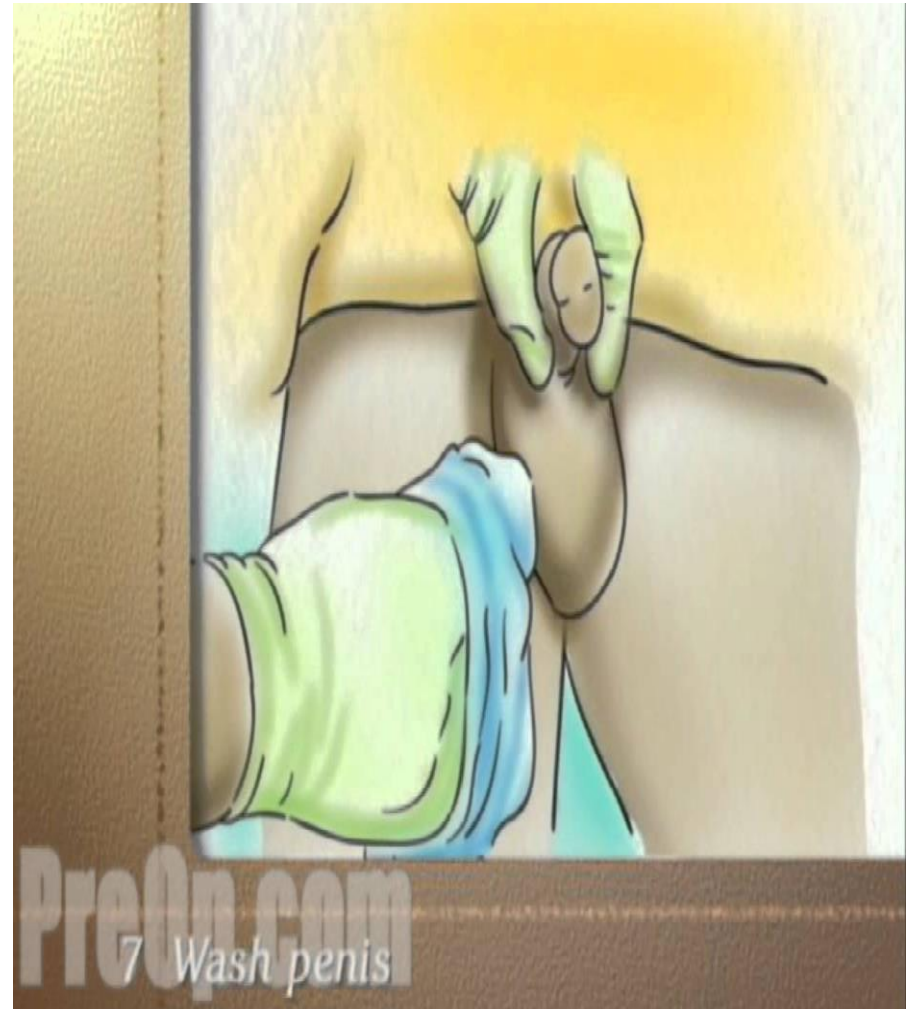
- **Midstream Clean Catch Specimen**
This is the preferred type of specimen for culture and sensitivity testing because of the reduced incidence of cellular and microbial contamination. Patients are required to first cleanse the urethral area with a castile soap towelette.

Collecting the Urine

- There are several different methods for collection of a urine sample. The most common is the **midstream clean-catch technique**. Hands should be washed before beginning. **For females, the external genitalia (sex organs) are washed two or three times with a cleansing agent and rinsed with water**. In males, the external head of the penis is similarly cleansed and rinsed. The patient is then instructed to begin to urinate, and the urine is collected midstream into a sterile container.

Male patients

- Retract prepuce, using plain soap or antiseptic clean glans. Dry with tissues.



Collection Urine by Male adult Patients

Figure 4-10-1 (continued) (c) Positioning of the catheter in the bladder. (d) Securing the catheter to the patient's leg.



Specimen Collection

- The urine collected in a wide mouthed container from patients
- A mid stream specimen is the most ideal for processing
- Female patients passes urine with a labia separated and mid stream sample is collected



Types Of Urine Collection

- The urine midstream is then collected into a clean container (any excess urine should be voided into the toilet). This method of collection can be conducted at any time of day or night.



Types Of Urine Collection

- (Specimens may also be collected through an existing Foley catheter.) Specimens may be collected directly from a Foley into an evacuated tube or transferred from a syringe into a tube or cup.



Types Of Urine Collection

- **Catheter Collection Specimen** This assisted procedure is conducted when a patient is bedridden or cannot urinate independently. The healthcare provider inserts a Foley catheter into the bladder through the urethra to collect the urine specimen.



Types Of Urine Collection

- **Pediatric Specimen** For infants and small children, a special urine collection bag is adhered to the skin surrounding the urethral area. Once the collection is completed, the urine is poured into a collection cup or transferred directly into an evacuated tube with a transfer straw. Urine collected from a diaper is not recommended for laboratory testing since contamination from the diaper material may affect test results.

Urine collected with Instructions

- Spread labia, using plain soap or antiseptic wipe front to back, dry with tissues
- Begin passing urine Stop flow in midstream
- Pass several ml into pen container without touching rim Stop flow before it ends
- Recap container
- Pass remaining urine into lavatory
- Send specimen to laboratory immediately
- (refrigerate if prolonged transport time)

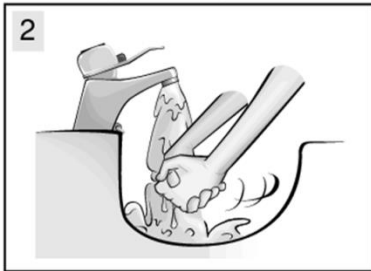
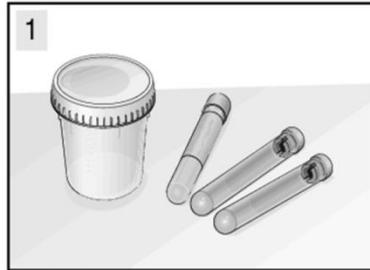
Collection of Urine by Female Patients



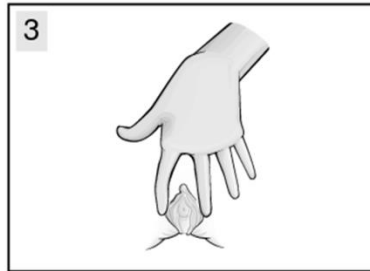
Collection of mid stream urine, girls

For a reliable sample, urine should be in the bladder for at least 4 hours. You have received a container and vacuumed specimen tubes.

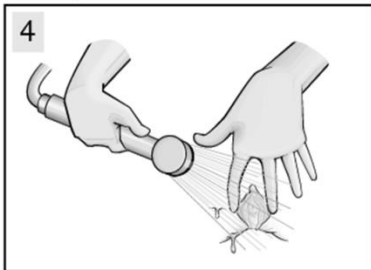
Do not open the specimen tubes!



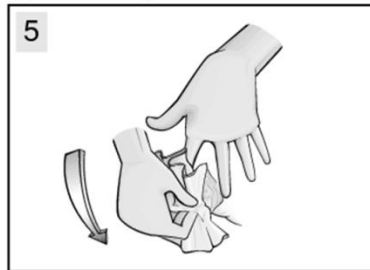
Wash your hands.



Spread the girl's labia.



Wash the girl's outer genital with running water.



Dry with a paper towel wiping from front to back.

Identifying the sample is important. Please fill in the following:

Name: _____

Personal ID number: _____

You previously passed urine _____ hours before this sample.

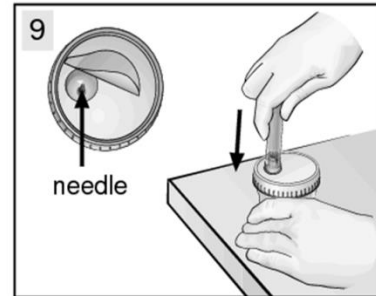
Date and time of collection: ____/____/____ at ____ o'clock ____



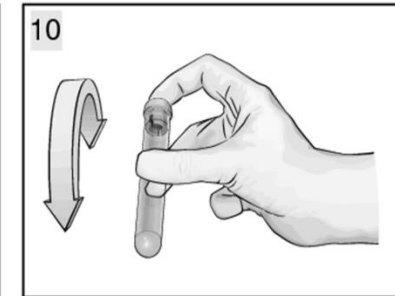
Open the lid of the collection container. Let the girl pass urine to the toilet.

Move the container into the stream without breaking it and fill about 2/3 of the container. Avoid touching the inside.

Move the container out of the stream and finish passing urine normally into the toilet.

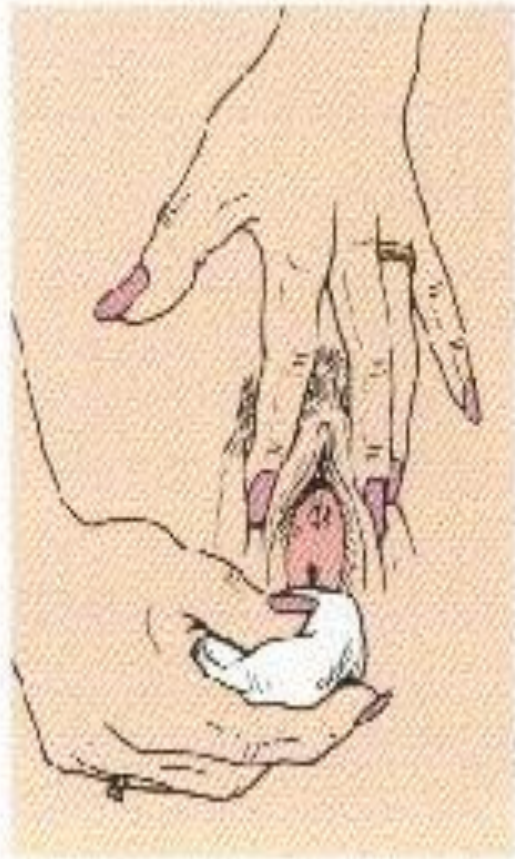


Close the container. Remove the label from the lid. Do not touch the needle. On a firm surface, press each tube (stopper first) down against the needle until the urine streams in. Fill each tube.



Turn the tubes upside down for 6 times. Bring the tubes to the laboratory as soon as possible.

Steps involve Cleaning the Genital area voiding fore stream and collecting midstream



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Collecting urine in infants and young children differs from adults

- In infants, a urinary collection bag (plastic bag with an adhesive seal on one end) is attached over the labia in girls or a boy's penis to collect the specimen.





how to
collect a
baby's
mid stream
urine

Procedure:

- It takes a minimum of two people to perform this procedure. However, it is better with three, one dedicated to making the catch.

Encourage oral fluid intake.

- 25 minutes following this feed, the baby/infants genitals are cleaned thoroughly with warm soapy water and dried with sterile gauze.
- Sterile container is prepared to collect specimen.
- Baby is held under the armpits (just above the bed) with legs dangling (the parents can easily assist with this).

Procedure:

- The nurse then starts bladder stimulation which consists of gentle tapping in the suprapubic area at a rate of 100 taps per minute for 30 seconds.
- Next, the lumbar paravertebral zone (think the small of the lower back) is massaged in a light circular motion for 30 seconds.
- Step 5 and six are repeated until urine is released.
- Stand clear & catch the mid-stream.

Specimen collection in infants and young Children- A peer Reviewed Method

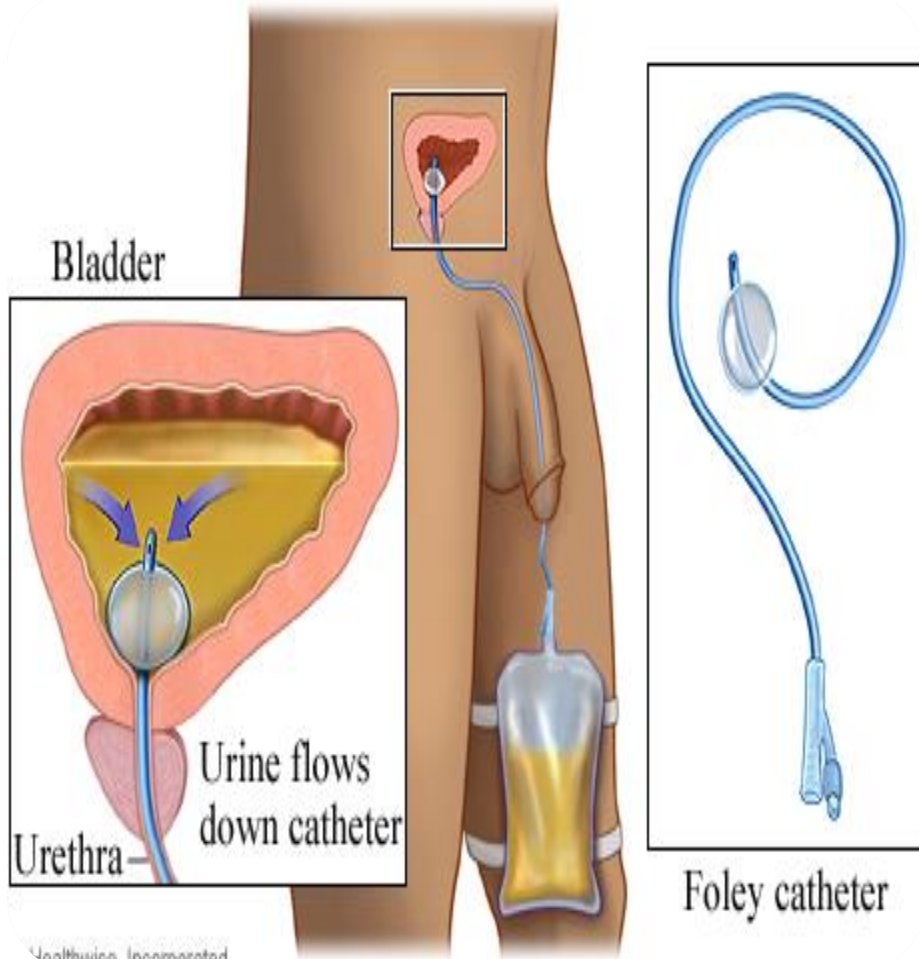
- Non invasive methods are safe and ideal
- **Follow the Broomhall et al method**

By tapping just above the pubis with two fingers place on suprapubic region after 1 hour of feed, tapping on at the rate of 1 tap/second for a period of 1 minute, if not successful tapping is repeated once aging.

The child spontaneously pass the Urine and to be collected in a sterile container



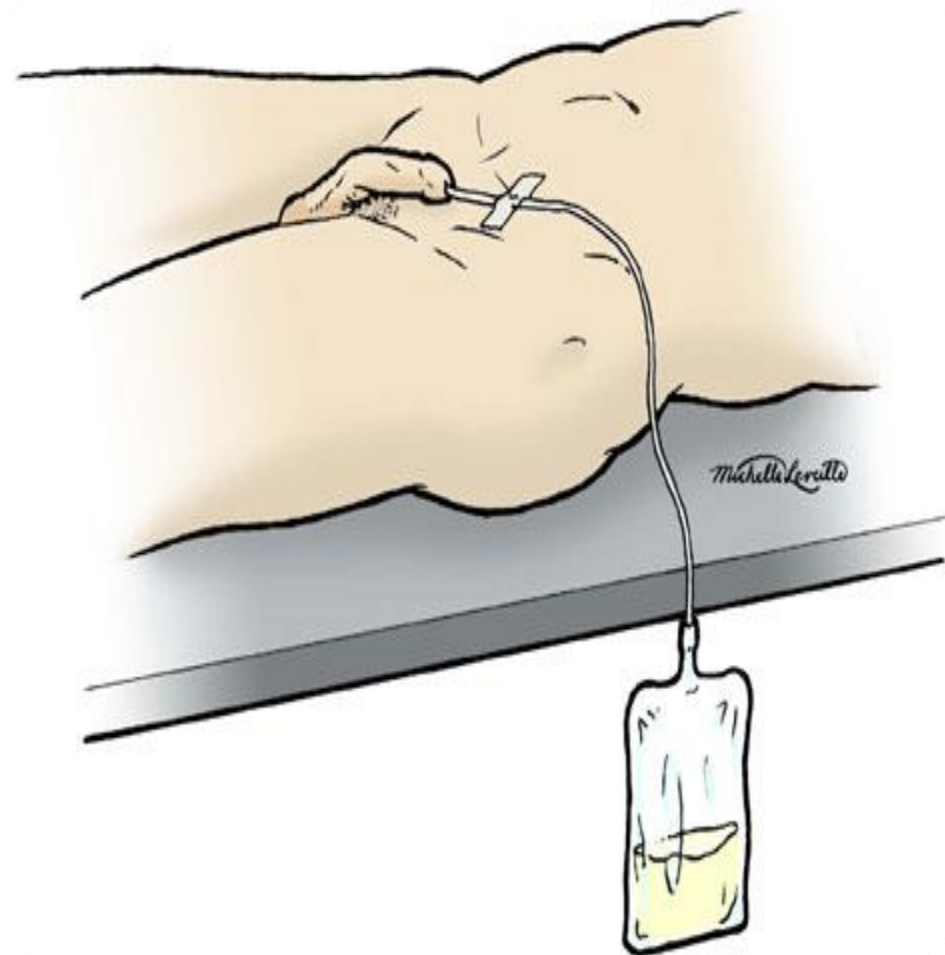
Catheterizing the Urinary Bladder for Collection



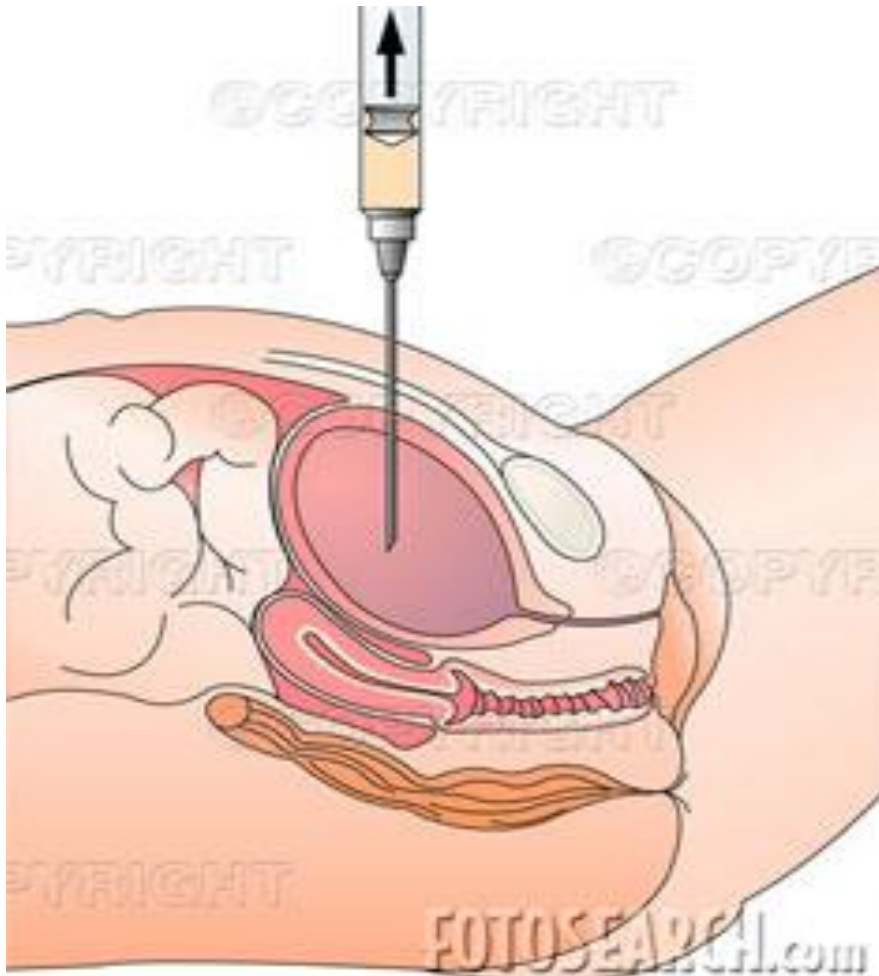
- Another method is the catheterized urine specimen in which a lubricated catheter (thin rubber tube) is inserted through the urethra (tube-like structure in which urine is expelled from the bladder) into the bladder. This avoids contamination from the urethra or external genitalia.

Specimen can be collected after clamping the catheter

- If the patient already has a urinary catheter in place, a urine specimen may be collected by clamping the tubing below the collection port and using a sterile needle and syringe to obtain the urine sample; urine cannot be taken from the drainage bag, as it is not fresh and has had an opportunity to grow bacteria at room temperature



Suprapubic puncture a technically demanding method



- On rare occasions, the health care provider may collect a urine sample by inserting a needle directly into the bladder (suprapubic tap) and draining the urine; this method is used only when a sample is needed quickly and technically competent staff are available

Sending the specimen to Laboratory

- If delivery of the urine specimen to the laboratory within one hour of collection is not possible, it should be refrigerated. The health care provider should be informed of any **antibiotics** currently or recently taken.



Preservation and Storage

Changes that affect the chemical or microscopic properties of urine occur if urine is kept at room temperature for more than 1 hour

Refrigeration – most common method for storing and preserving urine

It prevents bacterial growth for 24 hours.

After 24 hours use chemical preservation

Preservation of Urine Specimens



- Urine collected in sterile specimen container must be processed within 2 hours, or refrigerated and processed within 24 hours
- Urine collected in sterile specimen container with borate preservative should be processed within 24 hours (no refrigeration required)

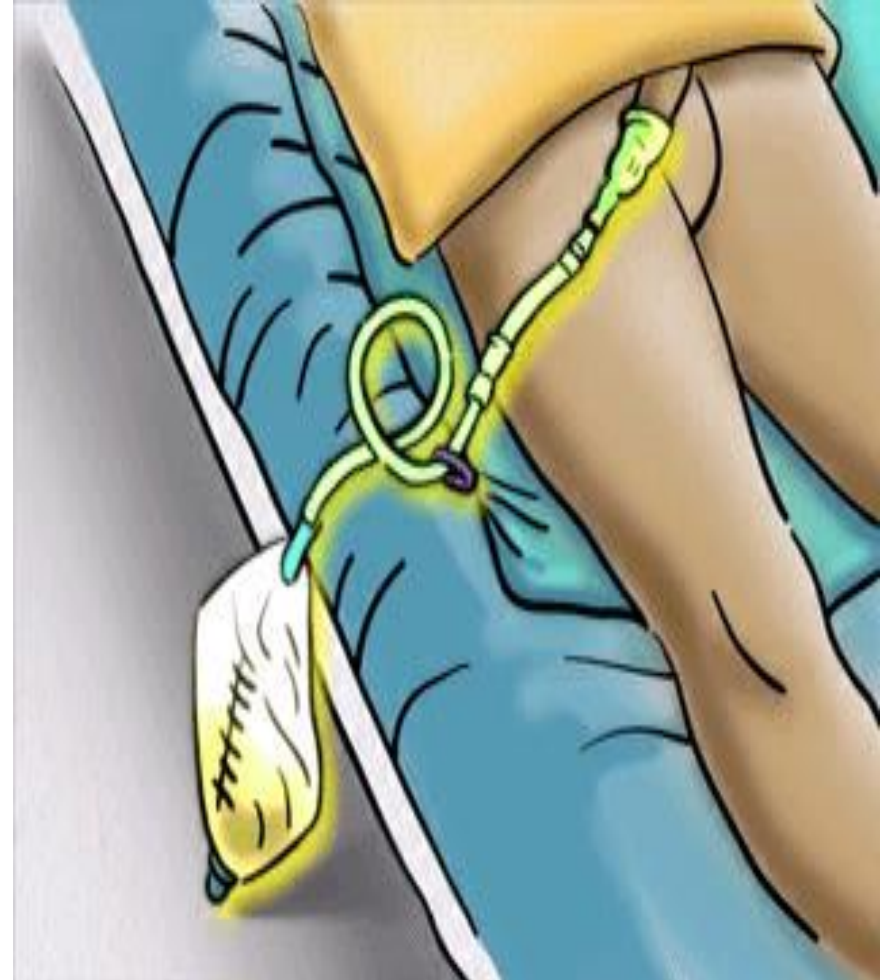
Types Of Urine Collection

- Suprapubic Aspiration Specimen This method is used when a bedridden patient cannot be catheterized or a sterile specimen is required. The urine specimen is collected by needle aspiration through the abdominal wall into the bladder.



Specimen Collection and Transport Guidelines

- **As with any type of laboratory specimen, there are certain criteria that need to be met for proper collection and transportation of urine specimens. This will ensure proper stability of the specimen and more accurate test results.**



Specimen Collection and Transport Guidelines

- **All urine collection and/or transport containers should be clean and free of particles or interfering substances.**
- **The collection and/or transport container should have a secure lid and be leak-resistant. Leak-resistant containers reduce specimen loss and healthcare worker exposure to the specimen while also protecting the specimen from contaminants.**

Urine Specimen Handling Guidelines

- **Labels** Include the patient name and identification on labels. Make sure that the information on the container label and the requisition match. If the collection container is used for transport, the label should be placed on the container and not on the lid, since the lid can be mistakenly placed on a different container. Ensure that the labels used on the containers are adherent under refrigerated conditions.

Prompt transportation needed

- Transport to lab as soon as possible
- **Urine should be cultured within 2 hours or be refrigerated for up to 24 hours**
- Microorganisms grow very rapidly in urine at room temperature
- This could give a false positive culture result



Urine Specimen Handling Guidelines

- **Collection Date and Time** Include collection time and date on the specimen label. This will confirm that the collection was done correctly. For timed specimens, verify start and stop times of collection. Document the time at which the specimen was received in the laboratory for verification of proper handling and transport after collection.



Caution – Never Collect Urine from Urine Bags for Microbiological Testing



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