Shrimati Indira Gandhi College

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Tiruchirappalli-2

CLINICAL BIOCHEMISTRY

Subject Code : 16SCCBC9

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III BSc BIOCHEMISTRY

COLLECTION AND PRESERVATION OF URINE SPECIMEN

VI SEMESTER

Content

Specimen collection and processing (urine)

1. **Collection of Urine Specimens**

2. **Preservatives**

Introduction

- Specimen collection is the process of obtaining tissue or fluids for laboratory analysis.
- It is often a first step in determining diagnosis and treatment.
- Urine specimen is frequently collected for microbiological and/or biochemical investigation.

Collection of Urine Specimen

- The type of urine specimen to be collected is dictated by the tests to be performed.
- Untimed or random specimens are suitable for only a few chemical tests.
- Usually, urine specimens are collected over a predetermined interval of time, such as 1, 4, or 24 hours

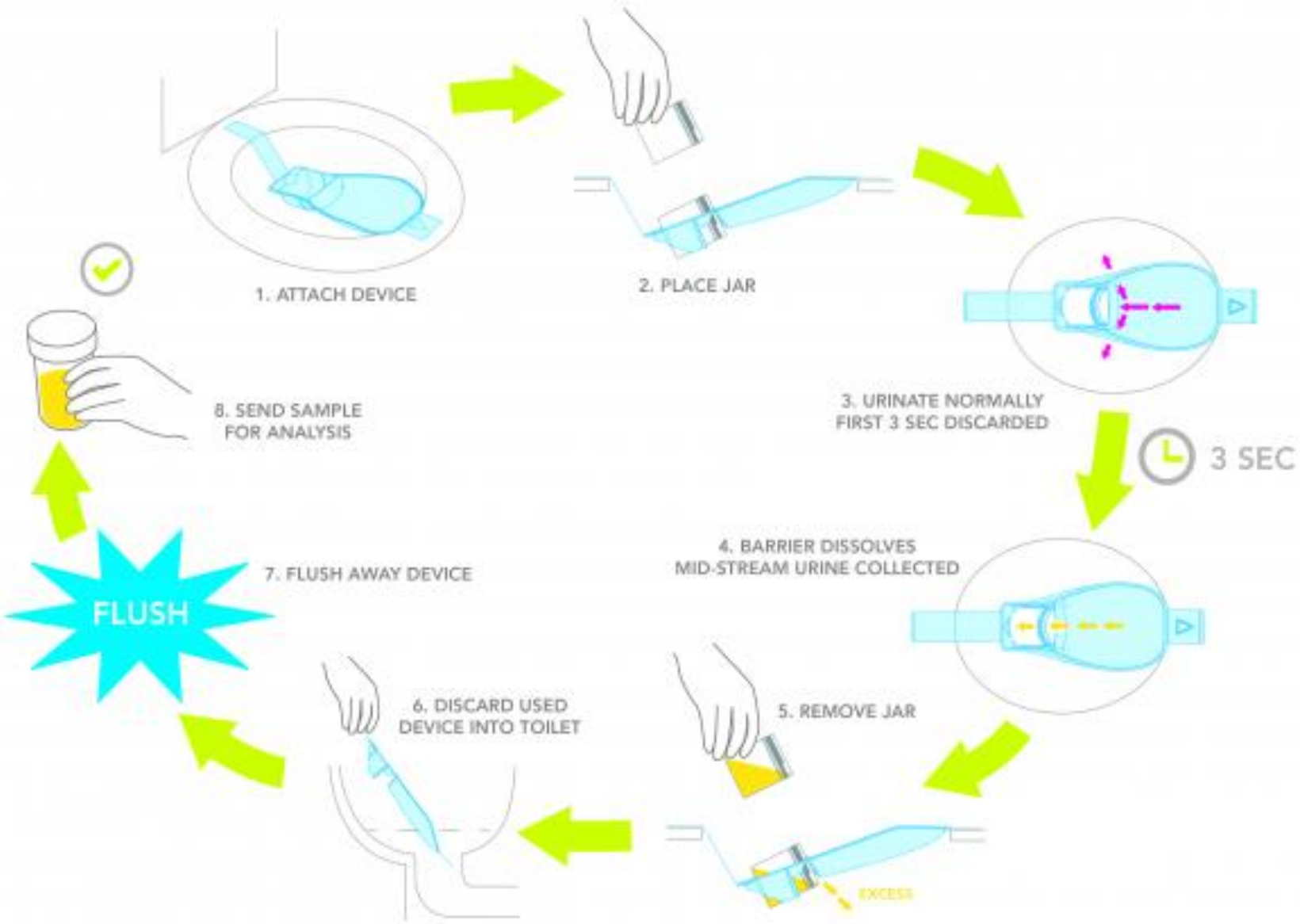
Collection time

- A clean, early morning, fasting specimen is usually preferred.
- It is the most concentrated specimen.
- It is preferred for microscopic examinations, and for the detection of proteins, or chorionic gonadotropin.
- The clean timed specimen is one obtained at specific times of the day or during certain phases of the act of micturition.

Collection of Urine for specific assays

- For Bacterial examination first 10 mL of urine voided is most appropriate to detect urethritis.
- Midstream specimen is best for investigating bladder disorders.
- The double-voided specimen is used to assess glucose excretion during a glucose tolerance test*.
- Its collection must be timed in relation to the ingestion of glucose.

Collection of mid stream urine device for specific assays



Sterile collection of urine

- The patient's genitalia should be cleaned before each voiding to minimize the transfer of surface bacteria to the urine.
- Cleansing is essential if the true concentration of white cells is to be obtained.

Timed Urine Specimens

- The collection period for timed specimens minimizes the biological variations.
- When specimens are collected the patient should adhere to instructions.
- The bladder must be emptied at the time the collection is to begin, and this urine discarded.
- Thereafter all urine must be collected until the end of the scheduled time.

Timed Urine Specimens……

- If the patient has a bowel movement during the collection period, precautions should be taken to prevent fecal contamination.
- If the collection is to be made over several hours, urine should be passed into a separate container at each voiding and then emptied into a larger container for the complete specimen.
- The large container should be stored at 4°C in a refrigerator during the entire collection period.

Specimen collection container

- For 2-hour specimens, a pre-labeled 1-L bottle is generally adequate.
- For a 12-hour collection, a 2-L bottle usually suffices.
- For a 24-hour collection, a 3- L or 4-L bottle is appropriate for most patients.
- Single bottle allows adequate mixing of the specimen and prevents loss if the second container does not reach the laboratory.

Collection and analysis

- Urine should not be collected at the same time for two or more tests requiring different preservatives.
- Aliquots for analysis such as a microscopic examination or molecular testing should not be removed while a 24 hour collection is in process.
- Removal of aliquots is not permissible even if the volume removed is measured and corrected.
- Because the excretion of most compounds varies throughout the day, and test results will be affected.

Collection of Urine from Children

- To collect an untimed urine specimen from an infant, it’s genitalia is first cleaned and dried, to remove any natural or applied skin oils.
- A plastic bag (U-bag) is placed around the infant's genitalia and left in place until urine has been voided.
- A metabolic bed is used to collect timed specimens from infants.

Collection of Urine from Children……

- The infant lies on a fine screen above a funnel-shaped base containing a drain under which a container is placed to receive urine.

- The collection of specimens from older children is done as in adults, using assistance from a parent when this is necessary.

Preservatives

Preservatives have different roles.

- They are usually added to reduce bacterial action or chemical decomposition.
- To solubilize constituents that might otherwise precipitate out of solution.
- Specimens for some tests should not have any preservatives added because of the possibility of interference with analytical methods.

Preservatives….

- One of the most satisfactory forms of preservation of urine specimens is refrigeration immediately after collection.

- Refrigeration is even more successful when combined with chemical preservation such as urinary preservative tablets or acidification.

Preservatives

- A weak base, such as sodium bicarbonate or a small amount of sodium hydroxide (NaOH), is used.
- It preserve specimens for porphyrins, urobilinogen and uric acid testing.
- A sufficient quantity should be added to adjust the pH to between 8 and 9 .

Preservatives

Hydrochloric Acid

- 50 ml of 2 M HCl is adequate for a 24-hr specimen suitable for the determination of Ca, P, N, ammonia, VMA estimation.
- It can also be used when sodium, potassium, urea estimations are required.
- but it is not suitable for uric acid and protein estimation as these may be precipitated.

Preservatives ....

Toluene

- 10 ml of toluene is commonly used for 24 hour collection for Na, K, uric acid, creatinine and protein analysis.
- but is not suitable for determination of Ca, P, VMA, ammonia, etc.

Preservatives ….

Hibitane (Chlorhexidine diacetate)

- It is a preservative when glucose is to be estimated in urine since it inhibits the action of

  bacteria but does not interfere with the analysis

  either by enzyme or reduction methods.
- 5 ml of a 5% aqueous solution is added to the container.

Preservatives ….

- Chloroform, light petroleum, thymol and formalin are used as urine preservatives. A few and one of these is put into a 2.5 l container and given for collection.

Reference

- Fundamentals of Clinical Chemistry, 6th ed, Burtis & Ashwood, Bruns, TietZ WB Saunders, 2008.


THANK YOU