Beaumont HEALTH

Beaumont Laboratory
Clinical Pathology
Royal Oak

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Related Documents:

24-HOUR URINE STONE FORMER PROCESSING

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Purpose

This processing procedure describes the general preparation of aliquots from a 24 hour urine for a stone former panel consisting of ten different assays. The stone former panel is useful in evaluating the likelihood of renal calculus formation and the type of calculus that may be formed.

Specimen Collection and Handling

A 24-hour urine sample is collected with no preservative, and is refrigerated or iced during collection. The 24-hour urine container from Inpatient, Outpatient or BRL should be delivered promptly to the laboratory upon completion of specimen collection. Upon receipt by the laboratory, the specimen may be refrigerated (2°–8° C) for 4 days or frozen (-10° C or colder) for longer storage.

Reagents/Supplies

- Graduated cylinders and measuring containers of various sizes
- Plastic aliquot tubes, fitted stoppers, individual test labels
- pH strips 0-7, 7-14
- 56° C heating block
- 12N HCl - Use concentrated reagent ACS grade (12.1 N) Hydrochloric Acid from the Acid Cabinet. Work under the Hood, and carefully pour into a 1-liter automatic pipetting reagent bottle. Label appropriately per laboratory procedure for content and safety precautions.
- 6N HCl - Prepare one liter of a x2 dilution of 12.1 N concentrated hydrochloric acid (reagent grade) as follows:
    - Use safety goggles, a face shield, or work in the fume hood with the sash lowered
    - Always add ACID to WATER
    - Place 500 mL of distilled or deionized water into a large 2-liter beaker
    - Measure 500 mL of concentrated HCL using a graduated cylinder
    - *Slowly* add the ACID to the WATER, swirling after each addition.
    - Use a funnel to carefully transfer the diluted acid into a 1-liter automatic pipetting reagent bottle.
    - Label the bottle appropriately for content and safety precautions.

- 10N NaOH – Dissolve **400 grams** reagent grade Sodium Hydroxide (NaOH) pellets in distilled or deionized water in a 1-liter volumetric flask. Dilute to 1 liter with distilled water and transfer to a 1-liter automatic pipetting reagent bottle. Label appropriately for content and safety precautions. Expiration 1 year.

Procedure

Measure the Total Volume (TV) and record on the specimen collection ID tag and on all test labels used. **Collections with <500 mL must be measured with a graduated cylinder**.

- Enter TV and collection dates/times into the LIS.
- When receiving STFRU order in LIS, 6 labels will be printed. Labels will print with necessary embiggined number (i.e. xxxxxxxxx. 2) for each aliquot as follows:
    - **- .2 Ur Pour Off** Na/K, Creatinine (Creat), Urea Nitrogen (UN)
    - **- .4 Ur Pour Alk** Uric Acid (pH 9)
    - **- .3 Ur Pour Acid** (Mg), Calcium (Ca), Phosphorus (Phos.) (pH 2)
    - **- .6 Ur Pour Acid** Oxalate (pH 2)
    - **- .5 Ur Pour Off** Citrate (citric acid)
    - **- .1 24H Ur** Extra Tube for a 4-week storage. 2 of these labels print.
- Mix urine well and pour aliquots into tubes labelled with **- .2** (Na/K, Creat, UN), **- .5** (Citrate), and **- .1** (extra tube). Cap and set aside in wire rack. These aliquots will not be pH adjusted.
- Pour small amount of well-mixed urine (10-15 mL) into a 100 mL urine cup. Adjust pH to 9 with a few drops of 10N NaOH. Confirm pH with pH test strips 7-14. If pH is greater than 9, add more urine until pH 9 is reached. Transfer pH=9 urine to aliquot tube extension **- .4** (Uric Acid). Cap and set aside in wire rack. Discard remaining urine in the 100 mL cup.
- Rinse 100 mL cup with water and drain. Pour additional 15-20mL of well-mixed urine into cup. Adjust pH to 2.0 with a few drops of 12N HCl or 6N HCl. Confirm pH with pH test strips 0-7. If pH is less than 2.0, add more urine until pH 2.0 is reached. Transfer the pH 2.0 urine to aliquot tubes **- .3** (Mg, Ca, Phos.) and **- .5** (Oxalate). Cap and set aside in wire rack. Discard remaining urine in the 100 ml cup, rinse and drain.
- Place aliquot tubes **- .4** (Uric Acid) and **- .3** (Mg, Ca, Phos.), and - **.6** (Oxalate) into the 56° C heating block for a minimum of 15 minutes.
- Discard remaining 24-hour urine into sink and rinse/drain graduated container.
- Following 15-minute heating, remove tubes **- .4** (Uric Acid) and **- .3** (Mg, Ca, Phos.), and – **.6**(Oxalate) from 56° C heating block.
- Centrifuge all aliquots except for the **–.1** extra tube, for five minutes.
- Load spun urine aliquots **- .2** (Na/K, Creat., UN), **- .4** (Uric Acid) and **- .3** (Mg, Ca, Phos.) at the IOM, to be tested on the analyzers.
- Deliver **- .6** (Oxalate) to the walk-in refrigerator and store in box for Special Chemistry testing. Deliver **-.5** (Citrate) to the Special Chemistry freezer.
- Archive Tube **- .1** (extra) in Specimen Tracking in LIS and store for 4 weeks.
- Store ID tags/cards (by date) for two (2) months in black file boxes.

Interpretation

Proper preparation of the 24-hour urine collection enables the laboratory to test for various components of the stone former panel. This assay includes: urine calcium, urine phosphorus, urine magnesium, urine Na/K, urine uric acid, urine creatinine, urine urea nitrogen, urine oxalate, and urine citric acid.

Elevated levels of calcium, oxalate, magnesium, and uric acid or **decreased levels** of citric acid may increase the risk of renal calculi formation.

References

Tietz, Fundamentals of Clinical Chemistry, 4th Edition. WB Saunders Co. 1996. pp.589-590

Authorized Reviewers

Section Medical or Technical Director

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Document Control

Location of Master: Master electronic file stored on the Beaumont Laboratory server under S:/AutomatedChemistry/DocControl/NEW/UA/24U/MasterDocuments

Master printed document stored in the Front Desk Procedure Manual.

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Document History

Signature		**Revision #**		**Related Documents Reviewed/ Updated**
Prepared by: K. Reynolds MT(ASCP)	12/19/2005			
Approved by: R. Karcher PhD	12/19/2005			
Reviewed by: (Signature)	**Date**	**Revision #**	**Modification**	**Related Documents Reviewed/ Updated**
R. Karcher PhD	11/02/2006	r01	Added instructions for reagent prep (6N HCl, 10N NaOH)	
R. Karcher PhD	12/13/2007			
R. Karcher PhD	02/08/2008			
R. Karcher PhD	12/04/2008			
R. Karcher PhD	11/10/2009			
Elizabeth Skyes , MD	01/04/2011			
Elizabeth Sykes, MD	05/28/2014	**R02**	Remove charge for measurement, change label information for aliquots for SOFT, load sample tray and load onto track	
Revised By: Robin Carey-Ballough, MT(ASCP)	03/07/2018	**r03**	Added requirement to heat Oxalate tube. Change heating time to 15 minutes.	
Steven M. Truscott, PhD	03/07/2018			
Revised By: Robin Carey-Ballough, MT	10/26/20	**r04**	Update to Beaker LIS.	
Approved By: Qian Sun, PhD	10/26/20			