Test Definition: AMSU

Amylase, Timed Collection, U

Overview

Useful For

Assessment of acute rejection of bladder-drained pancreas transplants

As an aid in the diagnosis of acute pancreatitis

Method Name

Enzymatic Rate

NY State Available

Yes

Specimen

Specimen Type

Urine

Necessary Information

For any timed collection the volume and length of collection is required.

Specimen Required

Supplies: Aliquot Tube, 5 mL (T465)

Container/Tube: Plastic, 5-mL tube (T465)

Specimen Volume: 5 mL

Collection Instructions:

1. Collect a 2-hour urine specimen.

2. The patient should have nothing by mouth except water between the hours of 6 p.m. and 10 a.m.

3. The bladder should be completely emptied at 8 a.m. This urine is discarded.

4. An adequate urine specimen (>100 mL) is ensured if the patient drinks 3 or more 8-ounce glasses of water. Half of this amount should be ingested between 7:30 a.m. and 8 a.m. The second half should be ingested at 8:30 a.m.

5. Collect all urine after 8 a.m. in container supplied.

6. The collection ends at 10 a.m. Include the 10 a.m. void in the collection container.

7. Measure and record the 2-hour volume.

8. Overlay urine with toluene (5 mL), and send aliquot. If no toluene is available, refrigerate specimen during collection, and send the aliquot specimen frozen.

9. Record the date and time (the exact start and completion times of the 2-hour collection) on the container label.

Forms

If not ordering electronically, complete, print, and send a Gastroenterology and Hepatology Client Test Request (T728) with the specimen.

Specimen Minimum Volume

1 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	7 days	
	Frozen	7 days	

Clinical and Interpretive

Clinical Information

Amylases are enzymes that hydrolyze complex carbohydrates. They are produced by a number of organs and tissues, predominantly the exocrine pancreas (P-type amylase) and salivary glands (S-type amylase). Plasma amylases are of relatively low molecular weight for an enzyme (55,000-60,000 daltons) and enter the urine through glomerular filtration. Conditions that cause increased entry of amylase into plasma (eg, acute pancreatitis) will thus result in increased urinary excretion of amylase. Therefore, urinary amylase is sometimes used in the diagnosis of acute pancreatitis. However, the rate of urinary amylase excretion appears to be less sensitive than plasma markers, and is not specific for the diagnosis of acute pancreatitis.

Similar to other low-molecular-weight proteins filtered by glomeruli, amylases are reabsorbed to an extent by the proximal tubule. Thus, conditions associated with increased production and glomerular filtration of other low-molecular-weight proteins that compete with tubular reabsorption of amylase or conditions of proximal tubular injury may increase urinary amylase excretion. Also, a number of disorders other than acute pancreatitis may cause increases in plasma amylase concentrations and consequent increases in urinary amylase excretion. These conditions include burns, ketoacidosis, myeloma, light-chain proteinuria, march hemoglobinuria, acute appendicitis, intestinal perforation, and following extracorporeal circulation.

Quantitation of urinary amylase excretion is also useful in monitoring for rejection following pancreas transplantation. The duodenal cuffs of donor pancreases are often surgically anastomosed to the recipient's bladder at the time of pancreas transplantation, allowing for drainage of exocrine pancreas fluid into the bladder. In pancreatic rejection, urinary amylase excretion decreases.

Reference Values

3-26 U/hour

Interpretation

Decreases in urinary amylase excretion of greater than 30% to 50%, relative to baseline values, may be associated with acute pancreas allograft rejection. Because there is large day-to-day variability in urinary amylase excretion

following pancreas transplantation, if a significant decrease is noted, it should be confirmed by a second collection. There is also large inter-individual variability in urinary amylase excretion among pancreas transplant recipients. Collecting a timed urine specimen and expressing the urinary amylase level as Units excreted/hour might reduce variability and improve test performance. However, acute rejection is usually not established solely by changes in urinary amylase excretion, but by tissue biopsy.

Urinary amylase is elevated in acute pancreatitis, but the test has poor sensitivity and specificity.

Cautions

No significant cautionary statements

Clinical Reference

1. Tietz Textbook of Clinical Chemistry. 3rd edition. Edited by CA Burtis, ER Ashwood. Philadelphia, WB Saunders Co., 1999, pp 689-698

2. Munn SR, Engen DE, Barr D, et al: Differential diagnosis of hypo-amylasuria in pancreas allograft recipients with urinary exocrine drainage. Transplantation 1990;49:359-362

3. Klassen DK, Hoen-Saric EW, Weir MR, et al: Isolated pancreas rejection in combined kidney pancreas transplantation. Transplantation 1996;61:974-977

4. Benedetti E, Najaran JS, Gruessener AC, et al: Correlation between cystoscopic biopsy results and hypoamylasuria in bladder-drained pancreas transplants. Surgery 1995;118:864-872

Performance

Method Description

This is an enzymatic rate reaction. The liquid Roche amylase method is an enzymatic colorimetric test using 4,6-ethylidene (G7)-p-nitrophenol (G1)-a, D-maltoheptaoside (ethylidene-G7PNP) as a substrate. Human salivary and pancreatic amylase convert the substrate at approximately the same rate. The alpha-amylase cleaves the substrate into G2, G3, G4 PNP fragments. The G2, G3 and G4 PNP fragments are further hydrolyzed by an alpha-glucosidase to yield p-nitrophenol and glucose. The rate of increase in absorbance at 415 nm (measuring the increase in p-nitrophenol) is proportional to amylase activity.(Package Insert: Roche P-Amylase, Roche Diagnostic Corp., Indianapolis, IN)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Sunday; Continuously

Analytic Time

1 day

Maximum Laboratory Time

2 days

Specimen Retention Time

7 days

Performing Laboratory Location

Rochester

Fees and Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification

This test has been cleared or approved by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

82150

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
AMSU	Amylase, Timed Collection, U	15350-2

Result ID	Test Result Name	Result LOINC Value
AMY_U	Amylase, Timed Collection, U	15350-2
TM21	Collection Duration	13362-9
VL19	Urine Volume	28009-9
AMYCN	Amylase Concentration	38192-1