

Beaumont Laboratory
Clinical Pathology
Royal Oak, MI 48073

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GLUCOSE HEXOKINASE II (GLU) ON ADVIA 1800

RC.CH.CSL.ADV.PR.030r04

Principle

Glucose is phosphorylated by adenosine triphosphate (ATP) in the presence of hexokinase. The glucose-6-phosphate that forms is oxidized in the presence of glucose-6-phosphate dehydrogenase causing the reduction of NAD to NADH. The absorbance of NADH is measured as an endpoint reaction at 340 nm.

Clinical Significance

Glucose measurements are used mainly in the diagnosis and treatment of carbohydrate metabolism disorders including diabetes mellitus, neonatal hypoglycemia, idiopathic hypoglycemia, and insulin overdose.

Specimen Collection and Handling

Serum, Urine, Peritoneal fluid, Pleural fluid, Dialysate fluid, and Amniotic Fluid are acceptable specimens.

- Follow Universal Precautions when collecting specimen.
- Collect body fluid in a sterile collection container or vacutainer tube without additive. (Min: 1.0mL)
- The 24 hour urine sample is refrigerated or iced during collection.
- Specimens are processed by centrifugation after allowing adequate amount of time for samples to clot. Keep tubes stoppered and upright at all times.
- Test specimens as soon as possible after collecting. Store specimens at 2° to 8°C if not tested within 8 hours after collection.
- Freeze samples at or below -20°C if sample is not assayed within 48 hours.
- Urine samples are refrigerated (2°-8°C) for 4 days or frozen (-10°C or colder) for longer storage upon receipt.

Reagents

Reagent 1 consists of ATP, NAD, and Sodium azide.

Reagent 2 consists of ATP, NAD, Hexokinase (microbial source), G6P-DH (microbial source), and Sodium azide.

Reagent is ready to use and requires no preparation.

Store at 2° to 8° C.

On board reagent stability is 60 days

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Calibration

Calibration is indicated when changing a reagent pack, after replacing critical optical or hydraulic components, and when indicated by out of control QC. Minimum calibration frequency is 60 days.

Calibration is performed using Chem Cal.

Quality Control

Two levels of BioRad quality control material are run each shift for serum and urine.

In addition, run following reagent change, maintenance, or calibration.

QC will upload to CentraLink upon completion. However, QC values in CentraLink must be reviewed by the operator to ensure that values fall within the laboratory's established values.

Refer to QC Procedures and Policies for Automated Chemistry when handling QC results that are outside of the expected values.

Special Safety Precautions

Follow Universal Precautions when handling specimens and quality control materials.

Procedure

Follow Standard Operating Procedure for the ADVIA 1800, regarding operation, reagent loading, and calibration.

Special Handling for Aborted GTT Reporting

There are special circumstances when the GTT samples may not be drawn as specified. If the FBS exceeds 140 mg/dL- Glucola is not administered. If the patient has a reaction after the Glucola is administered; vomits, faints, sent to ER etc, the draws will not be completed. The laboratory will handle the aborted GTT as follows:

- 1) Phlebotomist completes Patient Response with appropriate comment (e.g. Patient vomited).
 - 2) "Collect and Receive" all aborted specimens in LIS, using same date/time as FBS specimen.
 - 3) Enter FBS result.
 - 4) Add appropriate comment to FBS result (e.g. Patient vomited).
 - 5) "." remaining Glucose result fields.
 - 6) **IF pregnancy GTT that does not require Pathologist interpretation**, VERIFY ALL and SAVE to complete report.
 - 7) **IF non-pregnancy GTT**, Verify each GLU result and SAVE.
 - 8) Pathologist completes w/ aborted reason in "Interpretation" field, "Reviewed by", VERIFY ALL and SAVE.
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Calculations and Interpretations

Completed results will automatically upload to CentraLink. Results needing operator attention will remain in Sample Review Status in CentraLink for further investigation.

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Expected Values

Fasting serum: 60-99 mg/dL

Random serum: 60-139 mg/dL

Fasting serum Glucose:

60-99 mg/dL	Normal
100-125 mg/dL	Impaired fasting glucose*
> or = 126 mg/dL	Diabetic*

Amniotic fluid >15mg/dL

Peritoneal fluid approximates that found in serum

Pleural fluid >60 mg/dL

24 hour urine collection ranges: <0.9 g/24 hrs

Reportable Range

This method is linear from 10 mg/dL – 700 mg/dL for serum or fluid.

Extended linearity is from 10 mg/dL – 2100 mg/dL for serum or fluid after automatic instrument dilution.

This method is linear from 7 mg/dL – 700 mg/dL for urine.

Extended linearity is from 7 mg/dL – 2100 mg/dL for urine after automatic instrument dilution.

Refer to the Advia 1800 Manual Dilution procedure RC.CH.CSL.ADV.PR.009 for details on Maximum Reportable results.

Interfering Substances

A number of substances can cause physiological changes in serum analyte concentrations. Consult reference materials for specific details or known potential interfering substances.

References

See the Siemens Clinical Method sheets for detailed information on interpreting results, limitations, specificity and sensitivity and sero-conversion studies.

Authorized Reviewers

Section Medical or Technical Director

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