GLUCOSE

(GOD / POD method)

INTRODUCTION

Glucose is a simple six-carbon sugar. Oxidative metabolism of glucose provides the energy for most cellular processes. Glucose level in the blood is tightly controlled by several hormones. Elevated glucose level is the classic sign of diabetes mellitus. Glucose level abnormalities (hyper- or hypoglycemia) might be caused also by pancreas tumors and diseases of liver, thyroid gland or adrenal Glands.

METHOD PRINCIPLE

Colorimetric, enzymatic method with glucose oxidase.

$$\text{Glucose} + H_2O + O_2 \xrightarrow{GOD} \text{gluconic acid} + H_2O_2$$

$$2\,H_2O_2 + \text{phenol} + \text{4-aminoantipyrine} \xrightarrow{POD} \text{4-(p-benzochinonomonoimino)-phenazone} + 4\,H_2O \text{ (red colour)}$$

The colour intensity is proportional to the glucose concentration.

KIT CONTENTS

Reagent Name	Pack Size	Pack Size
R1 - Glucose Reagent	5 x 100 ml	1000 ml
R2 - Glucose Standard	3 ml	10 ml

Refer standard value mentioned on the vial.

WORKING REAGENT PREPARATION AND STABILITY

The reagent is ready to use.

The reagent when stored at 2-8°C is stable up to expiry date printed on the package. The reagents are stable for 8 weeks on board the analyser at 2-10°C. Protect from contamination.

CONCENTRATIONS IN THE TEST

glucose oxidase (GOD)	≥20000 U/L
peroxidase (POD)	≥ 2000 U/L
4 - Hydroxybenzoic acid	10 mmol/L
Phosphate buffer	50 mmol/L
Mutarotase	≥ 1500 U/L

WARNINGS AND NOTES

Product for in vitro diagnostic use only.

ADDITIONAL EQUIPMENT

- Automatic analyzer or photometer able to read at 500 nm (Hg 546 nm)
- Thermostat at 37ºC
- General laboratory equipment

SPECIMEN

Use fresh unhaemolysed serum. The stability of glucose in specimen is reduced by bacterial contamination and by glycolysis. Serum or plasma should be separated from the cells, as soon as possible, to prevent glycolysis.

PROCEDURE

These reagents may be used both for manual assay (Sample Start and Reagent Start method) and in several automatic analyzers. **Programme Sheets a**re available on request.

MANUAL PROCEDURE - END POINT METHOD

Wavelength	500 nm
Temperature	20-25ºC / 37°C
Cuvette	1 cm

Pipette into the cuvettes:

Reagent	Blank (B)	Standard (S)	Test (T)
R1 Glucose Reagent	1000 µl	1000 µl	1000 µl
Bring up the temperature of determination. Then add,			
Distilled Water	10 µl		
R2 - Glucose Standard		10 µl	
Sample			10 µl

Mix well, incubate for 10 min. at 37ºC or 15 min at 20-25ºC. Read the absorbance of the test A(T) and standard A(S) against reagent blank (RB).

CALCULATION

Glucose concentration = A(T) / A(S) x standard concentration

REFERENCE VALUES

Serum/Plasma	65 to 110 mg/dl
CSF	40 to 70 mg/dl

It is recommended for each laboratory to establish its own reference ranges for local population.

QUALITY CONTROL

To Ensure adequate quality control, each run should include assayed normal and abnormal controls. If commercial controls are not available it is recommended that known value samples be aliquoted, frozen and used as controls.

For Fully Automated analyzers by using multi calibrator or glucose standard the calibration curve can plot and the same should be prepared every 8 weeks or with change of reagent lot number.

PERFORMANCE CHARACTERISTICS

- **Sensitivity / Limit of Quantitation:** 0.5 mg/dl (0.03 mmol/l)
- **Linearity:** up to 500 mg/dl (27.5 mmol/l) using automatic analysers; up to 400 mg/dl (22 mmol/l) for manual procedure. If glucose concentration exceeds the range of linearity, dilute sample with 0.9% NaCl and repeat the assay. Multiply the result by the dilution factor.
- **Specificity / Interferences**
  Haemoglobin up to 2.5 g/dl, ascorbate up to 62 mg/l, bilirubin Up to 20 mg/dl and triglycerides up to 500 mg/dl do not interfere with the test.

WASTE MANAGEMENT

Please refer to local legal requirements.

LITERATURE

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SYSTEM PARAMETERS

Method	End Point
Wavelength	505 nm
Zero Setting	Reagent Blank
Temperature Setting	37° C
Incubation Temperature	37° C
Incubation Time	10 mins
Delay Time	-----
Read Time	-----
No. of Reading	-----
Interval Time	-----
Sample Volume	0.01 ml (10 ul)
Reagent Volume	1.0 ml (1000 ul)
Standard Concentration	Refer Standard vial
Units	mg/dl
Factor	-----
Reaction Slope	Increasing
Linearity	500 mg/dl

IVD

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