

# GLUCOSE IN BLOOD

By:

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# NORMAL RANGE

Fasting Blood Sugar: 70–110 mg/dl

Random Blood Sugar: <126mg/dl

Pre-Diabetes: 126–140 mg/dl

Hyperglycemia: >140 mg/dl

Children: 60–110 mg/dl

Newborns: 40–60 mg/dl

# Clinical Correlates

# HYPOGLYCEMIA

- Iatrogenic
- Idiopathic
- Starvation
- Insulinoma
- Hypo-pituitarism
- Cretinism
- Addison's Disease

# HYPERGLYCEMIA

- Diabetes Mellitus
- Iatrogenic
- Hyper-Thyroidism
- Idiopathic
- Post Prandial

Practical /  
Procedure

# GENERAL INFORMATION

Methods:

1. Folin–Wu Method
2. Orthotoludine method
3. Glucose Oxidase/ Peroxidase Method

We are going to perform GOD Method

# REQUIREMENTS

Spectrophotometer

Adjustable micropipette

Blood collection kit

Test tubes

Centrifuge with test tubes.

Other Requirements:

Blood sample

Glucose Standard--- 100mg/dl

Glucose Reagent



# REQUIREMENTS (CONTD)

## Composition of Glucose Reagent:

Glucose oxidase----- 15 KU/L

Mutarotase----- 2 KU/L

(Hydrogen) peroxidase----- 1.5 KU/L

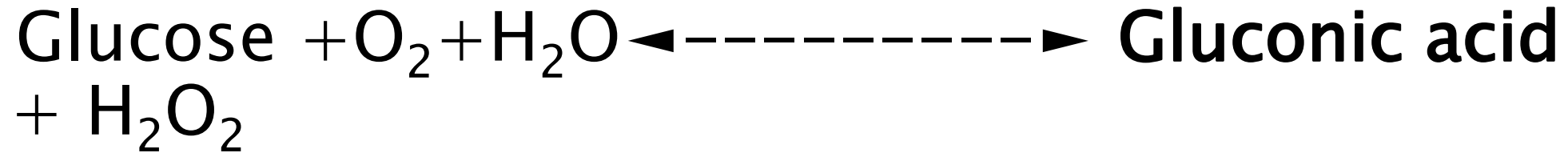
Phenol ----- 0.75 mol/L

4-aminophenazone----- 0.25 mol/L (The electron acceptor)

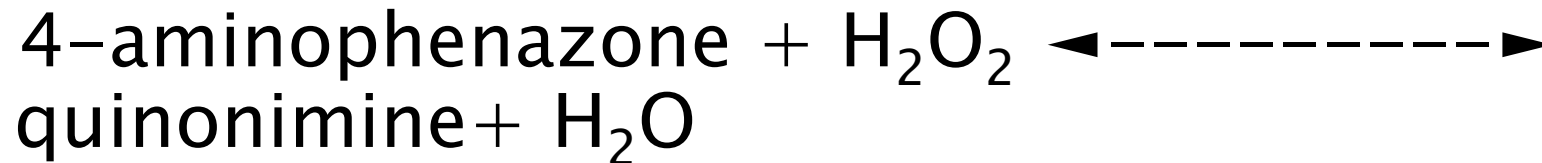
Phosphate Buffer----- 0.1 mol/L

# PRINCIPLE

GOD



Peroxidase



# PROCEDURE

Take Three Test Tubes and Mark them Unknown(U), Standard(S) and Blank(B).

Take 1ml of Working Reagent in each tube.

Add 10  $\mu$ l of distilled water into Blank(B).

Add 10  $\mu$ l of Standard Solution into Test tube marked as Standard(S).

Add 10  $\mu$ l of Serum into the test tube marked as Unknown(U).

Mix and Incubate for 10 minutes at 20—25 degree Celsius.

Check light absorbance via a calorimeter at 546nm.

$$\text{Calculation: Glucose concentration (mg/dl)} = \frac{\text{Unknown Absorbance}}{\text{Standard Absorbance}} \times 100$$

# LIMITATIONS

Minimum detectable limit is 5mg/dl

Maximum detectable limit is 500mg/dl

More than 500mg/dl of Cholesterol leads to abnormal results

Reducing Substances like Ascorbic Acid, creatinine, Uric Acid and Glutathione reacts with  $H_2O_2$  and decrease resultant Glucose level.

# RESOURCES USED:

Textbook of Medical Biochemistry by M.N.CHATTERJEA

Textbook of biochemistry for medical students by Sreekumari and DM Vasudevan

Wikipedia and Internet

Thanks A Lot