ORAL GLUCOSE TOLERANCE TEST (GTT)

- Objectives:

- Use OGTT in diagnosis of diabetes mellitus.

- INTRODUCTION

- Serial measurement of plasma glucose before and after glucose is given orally should provide a standard method to evaluate individuals and establish values for normal and disease states.

- There are two type of glucose tolerance test (Oral and IV).

-The most common glucose tolerance test is **the oral glucose tolerance test (OGTT)**.

- The test reveals how quickly glucose is metabolized from the bloodstream for use by cells as energy source.

- There are a number of factors that may affect glucose tolerance and that should be controlled or eliminated before such a test is performed :

cigarettes
Anxiety
activity
Coffee
amount of glucose ingested
carbohydrate intake
Time of pervious food intake
corticosteroids
Age
inactivity
weight
Some medicines

- How the test is performed

- When an oral glucose tolerance test is ordered, the following conditions should be met:

(1) Omit medications known to affect glucose tolerance.

(2) Perform the test in the morning after 3 days of unrestricted diet and activity.

(3) Perform the test after a 10-16 hours fast **(better 12 hour).**

- Oral dose : For adults, the recommended load is 75 g and for children, 1.75 g/kg,

- Plasma glucose should be measured **fasting** then every 30 min for 2h **after** an oral glucose load

- Note: the time of collection is different, it is depend on the situation.

- Why might I need to have the test?

- Generally most healthcare providers recommend that all pregnant women be screened for gestational diabetes.

- Experts recommend this test to pregnant women who are between 24 and 28 weeks of pregnancy .

- This test is also recommended for anyone suspected of developing adult diabetes.

- How the side effect during the test?

- Some people feel sweaty, light-headed, or may even feel short of breath or faint after drinking the glucose.

- However, serious side effects of this test are very uncommon.

Normal and abnormal results :

Normal : Fasting: 60 -128 mg/dL
1 hour: less than 200 mg/dL
2 hours: less than 140 mg/dL

Abnormal :

-Higher-than-normal levels of glucose may mean you have **prediabetes , diabetes (type 2)**, or **gestational diabetes**.

-Between 140 - 200 mg/dL is called ***impaired glucose tolerance***. And this Called "prediabetes." It means you are at increased risk for developing diabetes.

- A glucose level of 200 mg/dL or higher is a sign of diabetes (in adult individual) or gestational diabetes (in pregnant woman).

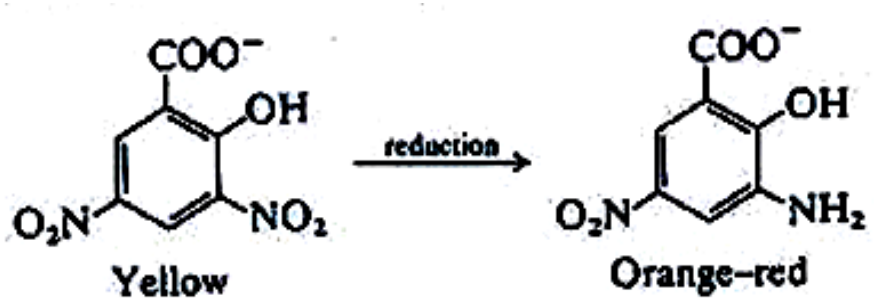
-**However,** high glucose levels may be related to another medical problem.

- PRINCIPLE:

- Several reagents can be used to assay reducing sugars such as 3, 5 dinitrosalicylic acid in one of the compounds.

- In alkaline solution it is reduced to 3-amino-5- nitro salicylic acid, which is orange-red.

- Absorbance is determined at 540 nm.



- GLUCOSE ESTIMATED BY O-TOLUIDINE METHOD:

	Plasma	Standard	dH2O	DNS reagent
Test (a1) (Fasting plasma)	0.1	-	-	2 ml
Test (a2) (Fasting plasma)	0.1	-	-	2 ml
Test (b1) Tow- hour	0.1	-	-	2 ml
Test (b2) Tow- hour	0.1	-	-	2 ml
Standard (1)	-	0.1	-	2 ml
Standard (2)	-	0.1	-	2 ml
Blank	-	-	0.1	2 ml

↓

Mix the contents of each tube and cover each tube by Aluminum foil

↓

Boiling water bath for 5 minutes

↓

cool the tubes for 1-3 min

↓

Read absorbance at 540 nm

- RESULT:

Tubes	Absorbance at 540 nm
Test (a1)	
Test (a2)	
Test (b1)	
Test (b2)	
Standard (1)	
Standard (2)	

- CALCULATIONS:

- Conc. Of Std. = 0.1 g/dl.
- Sample A = Fasting plasma glucose
- Sample B = Two hour plasma glucose

- Amount of glucose in plasma $= \frac{\text{Means Ab Test}}{\text{Means Ab Std.}} \text{X conc. Of Std} = \mathbf{Z}$ g/dl

- Z g/dl X 1000 = **Y mg/dl**

- Calculate the glucose in fasting glucose plasma and in two hours plasma glucose ..

- Then discuses your results ..