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Etiology, Patho Physiology, Specimen Requirements, Diagnostic Tests, Testing Procedure, Clinical Findings and Clinical Significance of Glucose Tolerance Test

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ABSTRACT

A glucose tolerance test (GTT) is a procedure that detects whether a patient can use and store generally. The test is helpful in a typical manner regarding diagnosis of diabetes mellitus, insulin resistance, impaired pancreatic β -cell function, and, Sometimes, reactive hypoglycaemia or acromegaly, as well as rarer disorders of carbohydrate metabolism.

Keywords: Hypoglycaemia, acromegaly, auto immune process, anti-hyper glycaemic agents, beta- cell generator capacity, haemolysis, potassium oxalate, glycated haemoglobin, impaired glucose tolerance and renal glycosuria

INTRODUCTION

In the most performed version, the oral glucose tolerance test (OGTT), a standard dose of glucose is consumed by mouth, and blood levels are measured 2 hours later. Many variations of the GTT have

been advanced over the years for different purposes, with varying standard glucose doses, administration routes, sampling intervals, and measurements of additional substances beyond blood glucose.[1]

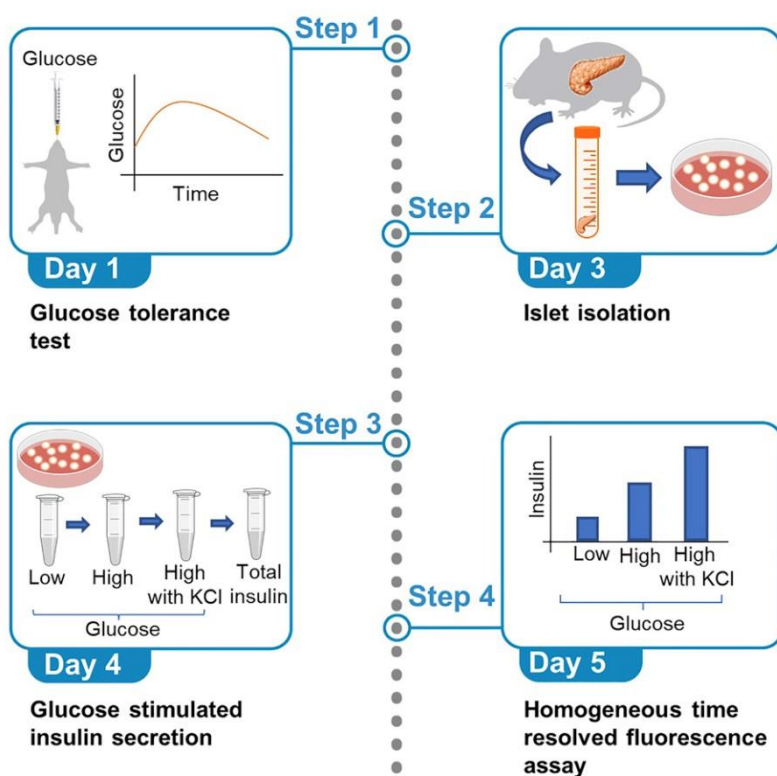


Fig. 1: A Protocol for inspecting glucose homeostasis.

LITERATURE REVIEW

The Glucose Tolerance Test (GTT) is an essential tool for diagnosing diabetes, gestational diabetes (GDM), and insulin resistance. However, it has poor reproducibility and standardization issues, with factors like sleep, stress, and even researcher intervention affecting results, according to a review of the literature. The GTT's 2-hour reading captures important early glucose intolerance, especially in conditions like GDM, even though it is occasionally replaced by simpler tests like HbA1c or fasting glucose. This has prompted research into more precise criteria, particularly for early pregnancy,

and its role in predicting postpartum diabetes.[2]

Key Themes in GTT Literature

- **Diagnostic Power:** For evaluating total glucose metabolism, identifying Impaired Glucose Tolerance (IGT), and identifying early diabetes that fasting tests miss, the GTT is regarded as the gold standard.
- **Limitations & Reproducibility:** Its unpredictability, which frequently necessitates two tests for confirmation, is a major criticism. Results can vary greatly between tests due to factors like patient preparation, stress, sleep, and even lab circumstances.[3]

- **Gestational Diabetes (GDM):** In order to prevent overdiagnosis and select high-risk women for insulin treatment, research focuses on suitable thresholds, particularly in early pregnancy. The GTT is essential for diagnosing GDM.
- **Prediction & Pathophysiology:** GTT data, particularly when combined with other insulin readings, aids in postpartum risk prediction and diabetes subtype differentiation, directing customized preventive measures.
- **Emerging Research:** Research examines how stress and sleep affect GTT outcomes, how well lifestyle modifications work to achieve GTT clearance after remission, and how to improve protocols for various demographics.[4]

Clinical Significance

- **Beyond Diabetes:** used to treat endocrine diseases (hypothyroidism, Cushing's), insulin resistance, pancreatic function, and reactive hypoglycemia.
- **Early Detection:** Prediabetes and early type 2 diabetes can be detected using the 2-hour post-load glucose.
- **Standardization Needs:** In order to reduce variability and increase reliability, ongoing efforts are focused on improving standardization.[5]

METHODOLOGY

In order to determine how well your body processes sugar, an Oral Glucose Tolerance Test (OGTT) requires you to fast, take a baseline blood sample, drink a standardized sugary solution (typically 75g glucose), and then have multiple blood samples taken at timed intervals (e.g., 1, 2, 3 hours). In between draws, you must rest and refrain from eating or drinking.[6]

Preparation (Before the Test)

- **Fasting:** For at least eight to fourteen hours prior to the test, you must abstain from all food and liquids, with the exception of sips of water.

- **Normal Diet:** For a few days prior to the test, stick to your regular diet; significant dietary changes may impact the test's outcome.
- **Medications:** Talk to your doctor about any medications you take because some can affect the outcome.[7]

During the Test (The Procedure)

1. **Baseline Blood Draw:** To determine your fasting blood sugar level, a medical professional takes a blood sample from a vein (or occasionally a fingertip or earlobe).
2. **Glucose Drink:** In a few minutes, you will consume a sweet, sugary beverage that contains a certain quantity of glucose (usually 75g for people).
3. **Waiting Period:** For the length of the test, which is often two to three hours, you will rest (either sitting or lying down) at the clinic or lab.[8]
4. **Timed Blood Draws:** After the drink, further blood samples are drawn at certain intervals (e.g., 1 hour, 2 hours, occasionally 3 hours) to measure glucose levels.
5. **Restrictions:** During the waiting period, avoid eating, drinking anything other than water as directed, smoking, and exercising as these activities can distort the results.

Key Variations (For Pregnancy/Screening)

- **Standard OGTT (Diabetes Diagnosis):** frequently entails fasting and blood collection one, two, and three hours following a 100g glucose load (or a 75g load for a single-step test).
- **Gestational Diabetes:** A 50g glucose challenge test (no fasting, 1-hour draw) may be used first, followed by a lengthier 3-hour 100g OGTT if the results are high, or a single-step 75g test.[9]

ETIOLOGY AND EPIDEMIOLOGY

Diabetes mellitus is a group of metabolic disorders manifested by hyperglycemia

leading to defects in insulin secretion, insulin action, or both. The latest data from the Centers for Disease Control and Prevention indicate that nearly 37.3 million Americans exhibit diabetes, and almost 96 million people aged 18 years or older—38.0% of the adult U.S. population—have prediabetes. Approximately 90% to 95% of all U.S. diabetes cases are type 2. Type 2 diabetes mellitus (T2DM) is estimated to be undiagnosed in at least 30% of the U.S. population.[10]

Type 1 diabetes mellitus (T1DM) leads to cell-mediated autoimmune destruction of the insulin-secreting β cells of the pancreas. Destruction is mediated by T cells in the vast majority of patients. The autoimmune process resulting in T1DM starts months or years before clinical presentation. An 80% to 90% reduction in β -cell volume is needed to bring about symptomatic T1DM. The rate of islet cell destruction is variable and generally more rapid in children compared to adults.

T2DM accounts for approximately 90% of all diabetes cases. Patients have minimal symptoms, are not prone to ketosis, and are not dependent on insulin to inhibit ketonuria. Insulin concentrations may be normal, reduced, or enhanced, and most people along with T2DM have impaired insulin action. Obesity is commonly associated, and weight loss alone may enhance hyperglycaemia. Whatever it may be, many individuals along with T2DM need dietary intervention, antihyperglycemic agents, or insulin to regulate blood glucose levels. Most patients develop the disease after age 40, even though it may happen in younger people.[11]

Gestational diabetes mellitus (GDM) is narrated as any degree of glucose

intolerance (ie, hyperglycaemia) along with onset or first recognition during pregnancy. Patients who become pregnant after a diagnosis of diabetes mellitus are not included in this category. The estimated frequency of abnormal glucose tolerance during pregnancy ranges from less than 1% to 28%, depending on the population studied and the diagnostic tests employed. The prevalence of GDM is enhancing, at least partly because of the considerable rise in obesity.

Patients along with GDM are at higher risk of developing T2DM in a significant manner, happening in 15% to 60% of cases. The risk is particularly high in individuals along with obesity, marked hyperglycaemia during or soon after pregnancy, or GDM diagnosed before 24 weeks of gestation. All patients who had GDM should be diagnosed for diabetes using nonpregnant OGTT criteria at 6 to 12 weeks postpartum. These individuals should be reevaluated at least every 3 years if diabetes is not determined at this time.

PATHOPHYSIOLOGY

Insulin resistance and an insulin secretory deficiency produced by β -cell dysfunction are the 2 defects that manifest the transition from normal glucose tolerance to T2DM. Reduced tissue sensitivity to insulin and pronounced compensatory hyperinsulinemia are characteristics of insulin resistance. Plasma glucose levels remain within the normal range initially. β -cell secretory capacity declines in patients who finally develop T2DM. The first detectable glucose abnormality is a rise in postprandial glucose levels because of decreased 1st-phase insulin secretion. Fasting glucose levels enhance as β -cell activity declines over time, and diabetes eventually develops along with further reduction of insulin secretion.[12]

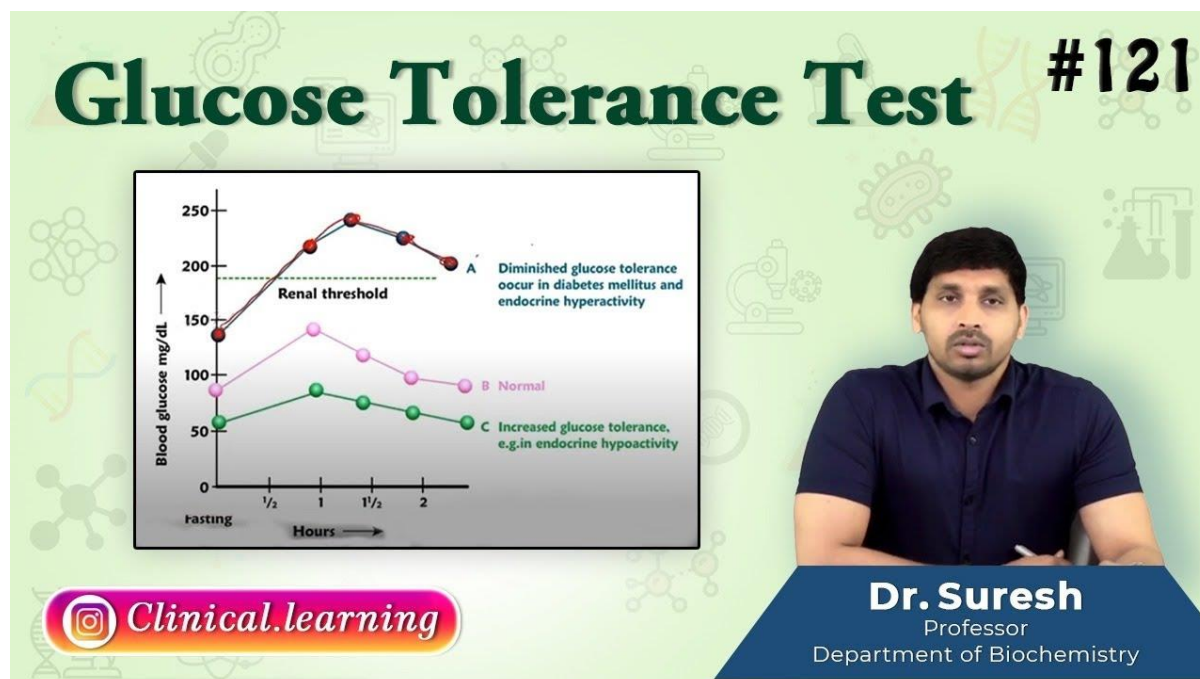


Fig. 2: Glucose Tolerance Test GTT.

SPECIMEN REQUIREMENTS AND PROCEDURE

The choice of specimen for glucose detection depends on the analytical method used. Serum or plasma, free of haemolysis, is selected for automated enzymatic methods. Glucose concentration in whole blood is approximately 12% to 15% lower than in plasma due to the lower water content in cells. Plasma is suggested for diagnosing diabetes, as the diagnostic cutoff points have been confirmed because of plasma samples. Glucose concentrations in heparinized plasma are approximately 5% lower than in serum.[13]

Plasma should be segregated from cells within 60 minutes of collection unless the tube contains a glycolysis inhibitor. Serum samples are suitable for glucose analysis, furnished they are not in contact with cells for longer than 90 minutes. Glucose in whole blood at room temperature undergoes glycolysis at a rate of approximately 5% to 7% (10 mg/dL or 0.6 mmol/L) per hour. Samples should be centrifuged and segregated from clots or cells as soon as possible. The rate of

glycolysis can be even higher in individuals along with leucocytosis or bacterial contamination.

To store blood that cannot be separated in a rapid manner, samples should contain the glycolysis inhibitor sodium fluoride, which inhibits enolase, at 2.5 mg fluoride/mL of blood. This reagent is used along with anticoagulants namely potassium oxalate. Glucose concentrations remain stable for 72 hours at room temperature along with fluoride, even though glucose reduces by 10% because of water shift from the cells. Glucose concentration does not change in serum or plasma samples collected in tubes along with gel separators. Glucose is stable for at least 1 week if stored at 4 °C in these tubes.[14]

DIAGNOSTIC TESTS

Plasma glucose may be measured along with high precision and accuracy by using techniques involving enzymatic reagents, especially glucose oxidase and hexokinase. The hexokinase method is considered the fastest and most accurate and is generally utilized on automated systems. Hexokinase

irreversibly phosphorylates glucose to glucose-6-phosphate, which is then coupled to glucose-6-phosphate dehydrogenase activity, enabling highly specific and sensitive measurement as well as metabolic control. By comparison, glucose oxidase methods are more susceptible to interference from substances namely uric acid and ascorbic acid.[15]

Fasting plasma glucose (FPG), glycated haemoglobin A1C (HbA1C), and 2-hour post-glucose load measurement during a 75-gram OGTT are all acceptable for diabetes diagnostic screening. Detection rates of different screening tests vary across populations and individuals. The efficacy of interventions for primary prevention of T2DM has mainly been demonstrated in people along with impaired glucose tolerance (IGT), with or without elevated fasting glucose, rather than in individuals along with isolated impaired fasting glucose (IFG) or prediabetes according to HbA1C thresholds.

TESTING PROCEDURES

Serial measurement of plasma glucose before and after a specific oral glucose load provides a standard method to diagnose individuals and establish values for healthy as well as diseased subjects. Even though more sensitive than FPG determinations, GTT is determined by multiple factors, leading to poor reproducibility. Approximately 20% of OGTTs fall into the nondiagnostic category (eg, only 1 blood sample shows increased glucose concentration). Unless results are grossly abnormal initially, the OGTT should be executed on 2 separate occasions to confirm a diabetes diagnosis.[16]

Conditions for conducting an OGTT include the following:

- Medications that affect glucose tolerance should be discontinued if possible.
- The test must be conducted in the morning after 3 days of unrestricted diet (≥ 150 g carbohydrate per day) and normal activity.
- The test should be managed after a 10- to 16-hour fast in ambulatory outpatients. Patients must remain seated, and smoking should be avoided.
- Glucose tolerance is impaired by bed rest. The diagnosis should not be executed in hospitalized, acutely ill, or inactive patients.
- The test must begin between 7:00 a.m. and 9:00 a.m.
- Venous plasma glucose should be measured fasting and 2 hours after the oral glucose load.
- A 75-g glucose load must be injected to nonpregnant adults. Children should attain 1.75 g/kg, up to a maximum of 75 g.
- Glucose should be dissolved in 250 to 300 mL of water and ingested over 5 minutes.

A commercial, more palatable glucose formulation may be consumed. Whether the anhydrous or monohydrate form is used remains uncertain.

Human growth hormone suppression by a glucose load is a classic screening test especially for acromegaly. Patients being evaluated for this condition must fast before starting an OGTT. A baseline blood sample is drawn for measurement of serum growth hormone. A drink containing 75 grams of glucose is discharged. Blood samples for serum growth hormone analysis are collected at 30, 60, 90, and 120 minutes after glucose consumption. Samples should be centrifuged within hour of collection and labelled according to the time points: baseline, 30, 60, 90, and 120 minutes.[17]

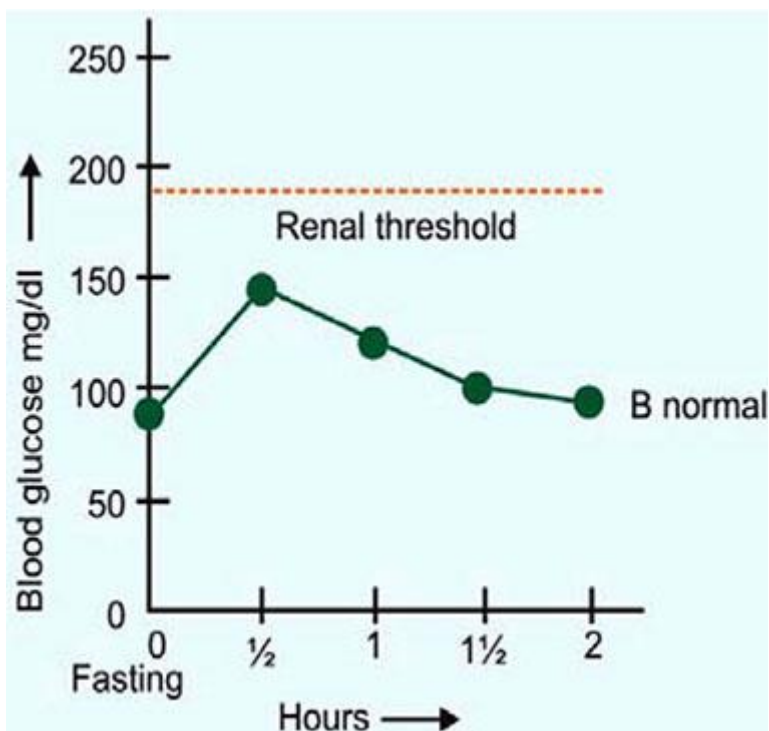


Fig. 3: Blood glucose concentration during fasting.

INTERFERING FACTORS

Several precautions must be seen if preparing for and executing the OGTT. The assessment should not be conducted in patients along with an infection, traumatic injuries, or severe illness. Drugs namely corticosteroids and diuretics, which may impair glucose tolerance, must be discontinued before the test if possible. The patient should have followed an unlimited diet containing at least 150 g of carbohydrates daily for at least 3 days and avoided unusual or vigorous exercise during that period.[18]

RESULTS, REPORTING, AND CRITICAL FINDINGS

IFG is narrated as having FPG levels of 100 to 125 mg/dL (5.6 to 6.9 mmol/L). IGT is manifested by having 2-hour post glucose load levels ranging from 140 to 199 mg/dL (7.8 to 11.0 mmol/L) during a 75-gram OGTT. The World Health Organization and several other diabetes organizations define the lower IFG limit as 110 mg/dL (6.1 mmol/L).

The results of the OGTT as a screening test for T2DM may be explained as follows:

- 2-hr plasma glucose below 140 mg/dL: normal
- 2-hr plasma glucose ranging from 140 to 199 mg/dL: IGT
- 2-hr plasma glucose of at least 200 mg/dL: diabetes

Confirming diagnosis needs repeating the test on another day shortly afterward and providing similar results. Alternatively, a diagnosis may be established with the help of one of the other suggested screening tests. A single abnormal OGTT is insufficient to diagnose diabetes or prediabetes.

The American Diabetes Association suggests either the 1- or 2-step approach at 24 to 28 weeks of gestation for pregnant patients not previously known to have diabetes.

One-Step Strategy for Screening and Diagnosis of Gestational Diabetes Mellitus

The diagnosis of GDM is made if any of the following plasma glucose values are met or exceeded during a 1-step strategy:

- FPG: 92 mg/dL (5.1 mmol/L)
- 1-hr plasma glucose: 180 mg/dL (10.0 mmol/L)
- 2-hr plasma glucose: 153 mg/dL (8.5 mmol/L)

This method entails administering a 75-gram glucose drink to a fasting patient and attaining plasma glucose readings at baseline, 1 hour, and 2 hours post load. The 1-step OGTT is highly sensitive for diagnosing GDM, capturing postprandial glucose abnormalities missed by simpler tests.

Two-Step Strategy for Screening and Diagnosis of Gestational Diabetes Mellitus

A 100-gram OGTT is suggested if plasma glucose at 1 hour after a 50-g glucose load, executed at 24 to 28 weeks of gestation in those not previously diagnosed along with diabetes, reaches or exceeds threshold values of 130, 135, or 140 mg/dL (7.2, 7.5, or 7.8 mmol/L, in a respective manner). The assessment should be conducted if the patient is fasting.

A diagnosis of GDM is established if at least 2 out of 4 plasma glucose measurements taken fasting and at 1, 2, and 3 hours during the OGTT meet or exceed the following.

- FPG: 95 mg/dL (5.3 mmol/L)
- 1-hr plasma glucose: 180 mg/dL (10.0 mmol/L)
- 2-hr plasma glucose: 155 mg/dL (8.6 mmol/L)
- 3-hr plasma glucose: 140 mg/dL (7.8 mmol/L)

By diagnosing glucose tolerance at fasting and several intervals after the glucose load, the 100-gram OGTT yields a detailed

metabolic profile critical for accurate GDM diagnosis. Whatever it may be, the complexity of this method has spurred investigation into alternative screening strategies that balance precision along with patient convenience.

Oral Glucose Tolerance Test in Acromegaly

The diagnostic criteria for acromegaly are met if the growth hormone level does not inhibit below 1 ng/mL. Whatever it may be, the growth hormone suppression test has been announced to have a false-negative rate of up to 50%. Sensitivity increases if a cut off of 0.4 ng/mL is used. Diagnosis requires clinical signs of growth hormone excess and raised insulin-like growth factor 1 levels. False-positive results where the hormone remains above 1 ng/mL after glucose administration may take place in individuals going through puberty or experiencing diabetes mellitus, liver disease, renal disease, or anorexia nervosa.

CLINICAL SIGNIFICANCE

The GTT establishes the presence of glucose intolerance. This diagnostic tool is specified in patients along with borderline fasting or postprandial glucose to support or rule out the diagnosis of diabetes mellitus. The test may also be applied in cases of unexplained hypertriglyceridemia, neuropathy, impotence, diabetes-like renal disease, and retinopathy. The OGTT is used to diagnose glycosuria without hyperglycaemia (e.g., renal glycosuria), predict perinatal morbidity during pregnancy, and diagnose GDM. Abnormal carbohydrate metabolism in pregnancy enhances the risk of foetal abnormalities and perinatal mortality.[19]

Reactive, or postprandial, hypoglycaemia is manifested by a reduction in blood glucose 2 to 5 hours after a high-carbohydrate meal. Early postprandial hypoglycaemia happens 2 to 3 hours after

a meal, and late postprandial hypoglycaemia happens 3 to 5 hours afterward. A 5-hour OGTT (5-OGTT) may be a useful laboratory investigation to diagnose postprandial hypoglycaemia. Whatever it may be, in clinical practice, the 5-OGTT is normally not suggested for evaluating reactive hypoglycaemia because of the risk of false-positive results.

QUALITY CONTROL AND LAB SAFETY

The implementation of a robust quality management system is essential in clinical laboratories that perform patient testing, including the OGTT. Quality management systems ensure the accuracy, reliability, and consistency of test results by merging quality assurance practices across all phases of testing. In the context of the OGTT, standardization of the pre analytical phase is especially crucial, as patient preparation influences the diagnostic outcome in a significant manner. Clear protocols include dietary consumption, fasting duration, and physical activity must be strictly followed in a strict manner to minimize variability and confirm clinical validity. In the analytical phase, quality is maintained through internal quality control and external quality assessment, both play an important role regarding observation of performance and confirming result validity.

For nonwaived tests, laboratory regulations need analysis of at least 2 levels of control materials once every 24 hours. Laboratories may assay quality control samples more frequently to confirm accurate results. Quality control samples should also be assayed after calibration or maintenance of an analyser to substantiate correct method performance.[20]

If manufacturer quality control suggestions are lower than regulatory needs (eg, once

per month), laboratories can implement an individualized quality control plan. This strategy involves executing a risk assessment of potential sources of error across all phases of testing and establishing a quality control protocol to decrease the likelihood of errors. Westgard multirules are applied to diagnose quality control runs, and any rule violations need appropriate corrective and preventive actions especially before patient testing.

The laboratory must participate in an external quality control or proficiency testing program, as needed by the Centers for Medicare and Medicaid Services (CMS) under the Clinical Laboratory Improvement Amendments (CLIA) regulations. Participation helps confirm the accuracy and reliability of laboratory results compared with other laboratories executing the same or comparable assays. Required participation and scored results are observed by the CMS and voluntary accreditation organizations. The proficiency testing plan should be incorporated into the laboratory's quality assessment plan and overall quality program. According to CLIA and the College of American Pathologists' proficiency program, glucose assay results are allowable when they deviate no more than 6 mg/dL or 8% from the mean value of laboratory peer groups.

All specimens, control materials, and calibrators should be treated as infectious in a potential manner. Standard precautions for handling laboratory reagents should be followed. Waste disposal must comply along with local guidelines. Personal protective equipment along with gloves, a lab coat, and safety glasses, should be worn if handling human blood specimens. Plastic tips, sample cups, and gloves that contact blood should be discarded in a biohazard waste container, and disposable glassware should be placed in sharps waste containers. Work surfaces

should be guarded along with disposable absorbent bench-top paper, which should be discarded into biohazard waste containers weekly or whenever contamination happens. All work surfaces should be wiped weekly.

ENHANCING HEALTHCARE TEAM OUTCOMES

A GTT is typically ordered by a medical doctor, advanced practice nurse, or physician assistant. Interprofessional collaboration is needed to ensure correct test performance. The healthcare provider or nurse must give the patient clear instructions on how to prepare for the examination and what to expect during the test.

The GTT may be administered in several settings. The evaluation may be carried out in a clinical office, equipped along with the necessary instruments and staffing, or a laboratory. Even though inpatient units are an atypical setting for the task, a hospital's outpatient or clinical research department may provide staff along with additional time to complete this examination.

Nurses, medical assistants, or phlebotomists may carry out the test. Clear communication of the healthcare provider's order is essential along with the type of test, duration, and number of samples needed. Personnel administering the test must be aware of all test requirements, including fasting and pretest dietary carbohydrate consumption. Collaboration along with laboratory staff is vital to ensure timely specimen processing, proper storage, and shipping when necessary. Laboratory personnel should work in a close manner along with providers to deliver accurate results efficiently.

RESULT & DISCUSSION

The results of a Glucose Tolerance Test (GTT) reveal how your body handles

sugar; normal means levels return to less than 140 mg/dL by two hours, prediabetes (Impaired Glucose Tolerance, or IGT) is between 140 and 199 mg/dL, and diabetes is more than 200 mg/dL, indicating impaired insulin response. The results frequently need to be confirmed and a conversation about diet, lifestyle, and additional management to prevent blood sugar spikes.

Glucose Tolerance Test Results & Interpretation

- The secret is to monitor your blood sugar levels after consuming a sugary beverage (about 75g of glucose), with findings usually assessed two hours later.
- **Normal:** < 140 mg/dL (7.8 mmol/L).
- **Prediabetes (Impaired Glucose Tolerance):** 7.8–11.1 mmol/L (140–199 mg/dL).
- **Diabetes:** 11.1 mmol/L, or 200 mg/dL.

Other Key Time Points

- **Fasting:** Diabetes \geq 126 mg/dL; Prediabetes 100–125 mg/dL; Normal < 100 mg/dL.
- **1-Hour:** Diabetes > 200 mg/dL, prediabetes 180–199 mg/dL, and normal < 180 mg/dL.

Discussion Points

- **Understanding the Spike:** As glucose enters the system, an initial increase in blood sugar is typical.
- **Insulin's Role:** Insulin is released by the pancreas in healthy people to transport glucose into cells and lower levels.
- **Impaired Response (Prediabetes/Diabetes):** Higher levels indicate insufficient insulin synthesis or insulin resistance since your body isn't eliminating glucose effectively.
- **Confirmation:** A single abnormal GTT result is frequently insufficient to diagnose diabetes; further testing (such as

an A1c or fasting glucose) is frequently required.

- **Gestational Diabetes:** A positive 1-hour screen during pregnancy is often followed by specific criteria and a 3-hour test.

What Abnormal Results Mean

- **Prediabetes:** You have an increased risk of heart disease, stroke, and type 2 diabetes; dietary and exercise modifications are essential.
- **Diabetes:** needs a care strategy that includes possible medication, dietary changes, and routine monitoring to avoid problems.
- **Next Steps:** In addition to discussing diet, exercise, and weight control, your doctor may recommend that you see an endocrinologist or nutritionist.

CONCLUSION:

Your 2-hour blood sugar level after consuming a sugary drink determines the outcome of a glucose tolerance test (GTT). Normal is less than 140 mg/dL, prediabetes (impaired glucose tolerance) is between 140 and 199 mg/dL, and diabetes is 200 mg/dL or higher. Further testing is frequently necessary for confirmation. Fasting levels can also be used to diagnose prediabetes (100–125 mg/dL) or diabetes (≥ 126 mg/dL).

Interpreting Your Results (2-Hour Mark)

- **Normal:** Below 140 mg/dL (7.8 mmol/L) – Your body processes sugar efficiently.
- **Prediabetes (Impaired Glucose Tolerance - IGT):** The range of 140 to 199 mg/dL (7.8 to 11.0 mmol/L) indicates that you may have Type 2 diabetes.
- **Diabetes:** 200 mg/dL (11.1 mmol/L) or higher: This indicates diabetes, which is typically verified by retesting the test.

Fasting Glucose Levels (Before the Drink)

- **Normal:** Below 100 mg/dL (5.6 mmol/L).
- **Prediabetes (Impaired Fasting Glucose - IFG):** 100–125 mg/dL (5.6–6.9 mmol/L).
- **Diabetes:** 126 mg/dL (7.0 mmol/L) or higher (on two separate tests).

Next Steps

- **Confirmation:** According to the Mayo Clinic, an abnormal result frequently triggers a repeat test or additional test (such as HbA1c) for a conclusive diagnosis.
- **Gestational Diabetes:** During pregnancy, different thresholds are applied.
- **Consult Your Doctor:** Your unique results in relation to your medical history can only be interpreted by a healthcare professional.

REFERENCES

1. Edwards, L. (2012). Oral glucose tolerance testing. *Australian Family Physician*, 41(10), 747–748.
2. Stern, M. P., Williams, K., & Haffner, S. M. (2003). Do we need the oral glucose tolerance test to identify future cases of type 2 diabetes? *Diabetes Care*, 26(3), 940–941.
3. Phillips, P. J. (2012). Oral glucose tolerance testing. *Australian Family Physician*, 41(6), 391–393.
4. Genuth, S. M., Palmer, J. P., & Nathan, D. M. (2018). Classification and diagnosis of diabetes. In C. C. Cowie et al. (Eds.), *Diabetes in America* (3rd ed.). National Institute of Diabetes and Digestive and Kidney Diseases.
5. Rowley, W. R., Bezold, C., Arikian, Y., Byrne, E., & Krohe, S. (2017). Diabetes 2030: Insights from yesterday, today, and future trends. *Population Health Management*, 20(1), 6–12.
6. Deshpande, A. D., Harris-Hayes, M., & Schootman, M. (2008). Epidemiology of diabetes and diabetes-related

- complications. *Physical Therapy*, 88(11), 1254–1264.
7. Acharjee, S., Ghosh, B., Al-Dhubiab, B. E., & Nair, A. B. (2013). Understanding type 1 diabetes: Etiology and models. *Canadian Journal of Diabetes*, 37(4), 269–276.
 8. Barnett, R. (2018). Type 1 diabetes. *The Lancet*, 391(10117), 195.
 9. Bluestone, J. A., Herold, K., & Eisenbarth, G. (2010). Genetics, pathogenesis and clinical interventions in type 1 diabetes. *Nature*, 464(7293), 1293–1300.
 10. Streisand, R., & Monaghan, M. (2014). Young children with type 1 diabetes: Challenges, research, and future directions. *Current Diabetes Reports*, 14(9), 520.
 11. Brunton, S. (2016). Pathophysiology of type 2 diabetes: The evolution of our understanding. *Journal of Family Practice*, 65(4 Suppl).
 12. Taylor, R. (2013). Type 2 diabetes: Etiology and reversibility. *Diabetes Care*, 36(4), 1047–1055.
 13. Fletcher, B., Gulanick, M., & Lamendola, C. (2002). Risk factors for type 2 diabetes mellitus. *Journal of Cardiovascular Nursing*, 16(2), 17–23.
 14. Kao, K. T., & Sabin, M. A. (2016). Type 2 diabetes mellitus in children and adolescents. *Australian Family Physician*, 45(6), 401–406.
 15. Quintanilla Rodriguez, B. S., Vadakekut, E. S., & Mahdy, H. (2024). *Gestational diabetes*. StatPearls Publishing.
 16. Kautzky-Willer, A., Harreiter, J., Winhofer-Stöckl, Y., Bancher-Todesca, D., Berger, A., Repa, A., Lechleitner, M., & Weitgasser, R. (2019). Gestational diabetes mellitus (Update 2019). *Wiener Klinische Wochenschrift*, 131(Suppl 1), 91–102.
 17. Hartling, L., Dryden, D. M., Guthrie, A., Muise, M., Vandermeer, B., Aktary, W. M., Pasichnyk, D., Seida, J. C., & Donovan, L. (2012). *Screening and diagnosing gestational diabetes mellitus*. Agency for Healthcare Research and Quality.
 18. Pillay, J., Donovan, L., Guitard, S., Zakher, B., Korownyk, C., Gates, M., Gates, A., Vandermeer, B., Bougatsos, C., Chou, R., & Hartling, L. (2021). *Screening for gestational diabetes mellitus: A systematic review*. Agency for Healthcare Research and Quality.
 19. Guthrie, R. A., & Guthrie, D. W. (2004). Pathophysiology of diabetes mellitus. *Critical Care Nursing Quarterly*, 27(2), 113–125.
 20. American Diabetes Association. (2011). Diagnosis and classification of diabetes mellitus. *Diabetes Care*, 34(Suppl 1), S62–S69.