

Practice Point

Prolonged Fasting Test

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ABSTRACT

Acute appendicitis is the most common abdominal emergency with a yearly incidence of about 100 per 100,000 inhabitants. The vast majority of patients with acute appendicitis present with marked pain and tenderness in the right iliac fossa associated with nausea, vomiting and pyrexia. The clinical diagnosis of acute appendicitis is based on history and physical, laboratory evaluation, and imaging. The therapeutic approach includes conservative non-operative management and surgical intervention. Advances in modern antibiotics and imaging studies have shifted the prevailing mindset, negating the belief that a diseased appendix inevitably belongs to the formalin jar. The optimal strategy for managing appendicitis involves an appendectomy, which can be performed through either an open or laparoscopic method. The laparoscopy facilitates accurate diagnosis, aids in excluding other pathologies, and lowers negative appendectomy rates.

Keywords: Appendicitis; Emergency, Laparoscopy

JMS: 2024 27(1): 58-59 DOI: <https://doi.org/10.33883/jms.v26i4.1311>

The prolonged fasting test (PFT), also known as the 72-hour supervised fast, is a crucial diagnostic tool for identifying endogenous hyperinsulinemia. This condition is characterized by excessive insulin production by the pancreas, even in the absence of food intake, leading to recurrent episodes of hypoglycemia.

Indications:

- Demonstrating fasting hypoglycemia when spontaneous or overnight fast hypoglycemia hasn't occurred.
- Diagnosing insulinoma, a rare pancreatic tumor causing excess insulin secretion.
- Investigating other causes of endogenous hyperinsulinemia like nesidioblastosis and familial hyperinsulinemia.

Contraindications:

- Severe uncontrolled medical conditions (e.g., heart failure, severe electrolyte imbalances).
- History of seizures or uncontrolled psychiatric illness.
- Pregnancy or breastfeeding.

Preparation:

- Admit the patient for close monitoring under trained medical supervision.
- Ensure informed consent and document pre-existing medications or nutritional supplements.
- Prepare glucose solutions (oral/intravenous) for potential hypoglycemic intervention.
- Provide the patient and nursing staff with clear instructions and a copy of the test protocol.

Procedure:

1. Cannulation: Establish venous access for blood sampling.
2. Fasting: Initiate a 72-hour (3-day) supervised fast, allowing only water and non-caloric beverages.
3. Monitoring:
 - o Measure blood glucose at regular intervals (4-6 hours),

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Access this article online



Website:
www.jmsskims.org

DOI:
<https://doi.org/10.33883/jms.v27i1.1335>

How to cite this article: Masoodi SR. Prolonged Fasting Test. JMS 2024; 27 (1)58-59

Received: 2024-02-17 Accepted: 2024-02-19



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and more frequently if symptoms of hypoglycemia appear (decrease to 2-hour intervals if glucose <54.0 mg/dL).

- o Monitor symptoms suggestive of hypoglycemia (e.g., sweating, dizziness, confusion).
 - o Ensure the patient stays active during waking hours.
4. Hypoglycemia management:
- o If blood glucose ≤ 40 mg/dL or symptoms warrant, collect blood for glucose, insulin, C-peptide, and sulphonylurea screen (ensure proper handling and timely analysis).
 - o Do not rush to reverse hypoglycemia until confirmed by lab results or unconsciousness/seizures occur.
5. Test completion:
- o If no symptoms during the fast, conclude with 15-30 minutes of moderate exercise (e.g., brisk walking).
 - o Collect blood samples for glucose, insulin, C-peptide, and sulphonylurea screen (if feasible).

Interpretation:

- Normal: Blood sugar levels remain within a certain range despite the fast, and insulin levels may decrease as stored glucose depletes.
 - Endogenous hyperinsulinemia:
- o Hypoglycemic episodes (glucose ≤ 40 mg/dL) with:
- § Elevated insulin levels compared to low blood sugar.
 - § Normal or high C-peptide levels (depending on the cause).

§ Negative sulphonylurea screen to rule out medication interference.

- o Consider the ratio of C-peptide to insulin to differentiate insulinoma and other causes.

Limitations:

- Risks include severe hypoglycemia and electrolyte imbalances, necessitating close supervision.
- It is not suitable for all hypoglycemia cases; initial tests and clinical judgment guide its necessity.
- Interpretation requires expertise, considering various factors beyond just blood sugar and insulin levels.
- Definitive diagnosis combines PFT results with clinical presentation and other investigations.

Remember:

- Normal subjects may have glucose around 40-54 mg/dL without symptoms, but true hypoglycemia (≤ 40 mg/dL) is required for further evaluation.
- Differentiate insulin sources using C-peptide levels and consider sulphonylurea screen.
- Ketones remain suppressed in true insulinoma despite fasting due to excess insulin.
- Sensitivity for insulinoma increases with test duration (66% by 24 hours, $>95\%$ by 48 hours).

Conclusion:

The PFT plays a critical role in diagnosing endogenous hyperinsulinemia, particularly insulinoma. By understanding its indications, procedures, and limitations, healthcare professionals can effectively utilize this test to guide accurate diagnosis and management of patients with suspected insulinoma.