

Overview

Useful For

Aiding in the diagnosis of infection using body fluid specimens

Method Name

Enzymatic Photometric Assay

NY State Available

No

Specimen

Specimen Type

Body Fluid

Ordering Guidance

For spinal fluid specimens, order GLSF / Glucose, Spinal Fluid. Testing will be changed to GLSF if this test is ordered on that specimen type.

Necessary Information

1. Date and time of collection are required.
2. Specimen source is required.

Specimen Required

Specimen Type: Body fluid

Preferred Source:

- Peritoneal fluid (peritoneal, abdominal, ascites, paracentesis)
- Pleural fluid (pleural, chest, thoracentesis)
- Drain fluid (drainage, JP drain)
- Peritoneal dialysate (dialysis fluid)
- Pericardial
- Amniotic Fluid
- Synovial Fluid

Acceptable Source: Write in source name with source location (if appropriate)

Collection Container/Tube: Sterile container

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL

Collection Instructions:

1. Centrifuge to remove any cellular material and transfer into a plastic vial.
2. Indicate the specimen source and source location on label.

Specimen Minimum Volume

0.5 mL

Reject Due To

| | |
|---|--------|
| Gross hemolysis | Reject |
| Gross Lipemia | Reject |
| Gross Icterus | Reject |
| Anticoagulant or additive Breast milk Nasal secretions Gastric secretions Bronchoalveolar lavage (BAL) or bronchial washings Colostomy/ostomy Feces Saliva Sputum Cerebrospinal fluid Urine Vitreous fluid | Reject |

Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---------------|--------------------------|----------|-------------------|
| Body Fluid | Refrigerated (preferred) | 7 days | |
| | Frozen | 30 days | |
| | Ambient | 24 hours | |

Clinical & Interpretive
Clinical Information

Blood glucose is measured to assess the glycemic state of a patient. Body fluid glucose concentrations that are lower than expected indicate increased cellularity and, therefore, glycolysis within the body fluid space. This serves as an indicator of infection or possibly malignancy. Body fluid glucose concentrations are expected to be lower than that found in serum or plasma. Ideally, they are measured in the fasting state, whereby glucose is able to equilibrate into the

space the body fluid is contained within.

Pleural fluid:

Low pleural fluid glucose concentrations (<40-60 mg/dL) indicate a complicated parapneumonic or malignant effusion.(1) However, low glucose is not specific for infection or malignancy and may be attributed to hemothorax, tuberculosis, or rheumatoid or lupus pleuritis, among other diseases. pH is the preferred test for making this determination when available.

Pericardial fluid:

Pericardial fluid glucose levels have been investigated on a limited basis. In presumed normal specimens collected during surgery, pericardial fluid-to-serum ratio for glucose was 1.0 (95% CI, 0.8-1.2).(2)

Peritoneal fluid:

Ascitic fluid glucose should be interpreted in conjunction with serum glucose measurement. In a cohort of noninfected patients with alcohol-related cirrhosis, the mean (SD) ascitic fluid-to-serum glucose ratio was 1.04 (0.25).(3) Ascitic fluid glucose may be helpful in differentiating spontaneous bacterial peritonitis from secondary peritonitis caused by bowel perforation.(4) Secondary peritonitis is likely if 2 of the 3 following criteria are met:

1. Total protein is greater than 1 g/dL
2. Lactate dehydrogenase is greater than 225 IU/L (or greater than the upper limit of normal for serum)
3. Glucose is less than 50 mg/dL(4)

Amniotic fluid:

Amniotic fluid is produced by the amnion and placenta, representing a plasma ultrafiltrate. Amniocentesis may be performed to assess fetal distress. Intraamniotic infection or chorioamnionitis is an acute inflammation of the fetal membranes commonly caused by bacterial infection prompting an inflammatory response leading to labor and term or preterm birth.(5) Chorioamnionitis may be symptomatic (clinical) or asymptomatic (histological), occurring most often during prolonged labor or as a consequence of membrane rupture as bacteria have greater opportunity to ascend the lower genital tract to colonize the uterus. Prompt diagnosis and treatment for clinical chorioamnionitis is critical to avoid maternal and fetal morbidity and mortality. Culture and gram stain are often used in the assessment of infection, however, gram stain lacks sensitivity and culture results are not returned in a timely enough manner to make clinical decisions. Low glucose concentrations have been associated with positive culture results and consequently poor outcomes.(6)

Synovial fluid:

Synovial fluid is present in joint cavities and serves a number of important roles in maintaining joint health and mobility. Symptoms of joint problems include pain, swelling, stiffness, or decreased range of motion.

Routine analysis of synovial fluid includes Gram stain, culture, crystal analysis, and cell count with white blood cells differential. In normal synovial fluid, glucose concentrations are similar to those observed in fasting serum. Low synovial fluid glucose has been associated with septic arthritis or inflammation.(7)

Reference Values

An interpretive report will be provided.

Interpretation

Body fluid glucose concentrations may be decreased due to increased cellular metabolism and should be interpreted in

the context of blood glucose concentrations and in conjunction with other laboratory and clinical findings.(8, 9)

Pleural, peritoneal, and pericardial fluid and serum glucose concentrations are similar in the absence of infection.(3)

Transudative pleural fluid glucose concentrations are similar to serum glucose concentrations, while exudates have glucose concentrations less than serum glucose. Glucose levels below 60 mg/dL are typically associated with low fluid pH.(1,10)

Amniotic fluid glucose levels below 16 mg/dL is suggestive of infection.(6)

Synovial fluid glucose concentrations are similar to fasting blood glucose concentrations or approximately 50% of the nonfasting serum glucose concentration under normal conditions. Values below this can be seen with infection.(7)

Cautions

Body fluid glucose results are not diagnostic and should be interpreted in conjunction with other laboratory and clinical findings.

Specimens that have cells present, either due to trauma during collection (ie, blood present) or due to infection (ie, bacteria), that are not centrifuged and separated from cells as soon after collection as possible, may have falsely decreased glucose concentrations owing to the continued metabolic action of cells in vitro.

In very rare cases of gammopathy, in particular type IgM (Waldenstrom macroglobulinemia), may cause unreliable results.

Clinical Reference

1. Light RW. Clinical practice. Pleural effusion. *N Engl J Med.* 2002;346(25):1971-1977
2. Ben-Horin S, Shinfeld A, Kachel E, Chetrit A, Livneh A. The composition of normal pericardial fluid and its implications for diagnosing pericardial effusions. *Am J Med.* 2005;118(6):636-640
3. Wilson JA, Suguitan EA, Cassidy WA, Parker RH, Chan CH. Characteristics of ascitic fluid in the alcoholic cirrhotic. *Dig Dis Sci.* 1979;24(8):645-648
4. Runyon BA, Hoefs JC. Ascitic fluid analysis in the differentiation of spontaneous bacterial peritonitis from gastrointestinal tract perforation into ascitic fluid. *Hepatology.* 1984;4(3):447-450
5. Gonzalez-Bosquet E, Cerqueira MJ, Dominguez C, Gasser I, Bermejo B, Cabero LI. Amniotic fluid glucose and cytokines values in the early diagnosis of amniotic infection in patients with preterm labor and intact membranes. *J Matern Fetal Med.* 1999;8(4):155-158
6. Margaretten ME, Kohlwes J, Moore D, Bent S. Does this adult patient have septic arthritis? *JAMA.* 2007;297(13):1478-1488
7. Knight JA, Kjeldsberg CR: Cerebrospinal, synovial, and serous body fluids. In: McPherson RA, Pincus MR, eds. *Henry's Clinical Diagnosis and Management by Laboratory Methods.* Elsevier, 2007;448
8. Brunzel NA: Pleural, pericardial, and peritoneal fluid analysis. In: *Fundamentals of Urine and Body Fluid Analysis.* WB Saunders Company. 1994;406
9. Sahn SA: Getting the most from pleural fluid analysis. *Respirology.* 2012;17(2):270-277
10. Meyers DG, Meyers RE, Prendergast TW. The usefulness of diagnostic tests on pericardial fluid. *Chest.* 1997;111(5):1213-1221
11. Kacerovsky M, Holeckova M, Stepan M, et al. Amniotic fluid glucose level in PPRM pregnancies: a glance at the old friend. *J Matern Fetal Neonatal Med.* 2022;35(12):2247–2259

12. Cotton, SW, Block DR. A review of current practices and future trends in body fluid testing. J Appl Lab Med. 2023;8(5):962-983. doi:10.1093/jalm/jfad014

Performance

Method Description

Glucose, in the presence of hexokinase, is converted to glucose-6-phosphate (G6P). Glucose-6-phosphate dehydrogenase (G6PDH) oxidizes G6P in the presence of nicotinamide adenine dinucleotide phosphate (NADP) to gluconate-6-phosphate and NADPH. The rate of NADPH formation is directly proportional to glucose concentration and is measured photometrically. (Package insert: Glucose reagent. Roche Diagnostics; 01/2018)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

Same day/1 to 3 days

Specimen Retention Time

7 days

Performing Laboratory Location

Jacksonville

Fees & Codes

Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

Test Classification

This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

82945

LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---------|-----------------|--------------------|
| GLBF | Glucose, BF | 2344-0 |

| Result ID | Test Result Name | Result LOINC® Value |
|-----------|---------------------|---------------------|
| GL_BF | Glucose, BF | 2344-0 |
| FLD12 | Fluid Type, Glucose | 14725-6 |