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| **Lactate Dehydrogenase (LDH), Body Fluid** | |
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| **CSF LDH** |  |
| Clinical Indications | CSF evaluation (non-routine) |
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| Reference Interval and/or Interpretive Information | Normal CSF LDH activities have been described as <40 U/L for adults and <70 U/L for neonates. [1] |
| They have also been described as about 10% of corresponding serum activity. [1] |
| Elevations of CSF LDH activity have been associated with a variety of neurologic disorders [1], but are generally not considered part of routine CSF testing. |
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| References | [1] Karcher DS, McPherson RA. Chapter 29: Cerebrospinal, synovial, serous body fluids, and alternative specimens. In Henry’s Clinical Diagnosis and Management by Laboratory Methods. 22nd Ed. McPherson RA, Pincus MR. Eds. Elsevier Saunders: Philadelphia, PA, 2011. ISBN: 1437709745. |
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| **Pericardial Fluid LDH** | |
| Clinical Indications | Supportive evidence for differentiation of exudates and transudates |
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| Reference Interval and/or Interpretive Information | LDH activity (>200 IU/L) and/or a fluid-to-serum LDH ratio of >0.6 is one component of Light’s criteria for differentiating exudates from transudates, and have been applied to pericardial fluids in one report. [1] |
| LDH activity and/or LDH fluid-to-serum ratio, however, have poor sensitivity for differentiating exudates from transudates on their own. [2] |
| In a study of 30 patients undergoing elective open heart surgery (without evidence of pericardial disease), the “normal” pericardial fluid mean LDH activity was 398 IU/L (99% confidence interval, 276-517 IU/L). [3] |
| This was also expressed as a “normal” mean fluid-to-serum LDH ratio of 2.4 (99% confidence interval, 1.3-3.5). [3] |
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| References | [1] Burgess LJ, Reuter H, Taljaard JJF, Doubell AF. 2002. Role of biochemical tests in the diagnosis of large pericardial effusions. CHEST. 121(2):495-499. |
| [2] Meyers DG, Meyers RE, Prendergast TW. 1997. The usefulness of diagnostic tests on pericardial fluid. Chest. 111(5):1213-21. |
| [3] Ben-Horin S, Shinfeld A, Kachel E, Chetrit A, Livneh A. 2005. The composition of normal pericardial fluid and its implications for diagnosing pericardial effusions. The American Journal of Medicine. 118:636-640. |
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| **Peritoneal/​Ascites Fluid LDH** | |
| Clinical Indications | Supportive evidence for differentiation of secondary from primary bacterial peritonitis |
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| Reference Interval and/or Interpretive Information | Differentiation of secondary bacterial peritonitis (GI tract perforation) from spontaneous primary bacterial peritonitis is supported when two of the following three criteria are present: ascites fluid total protein >1g/dL, ascites fluid glucose <50 mg/dL, and ascites fluid LDH >225 IU/L (or greater than the serum upper reference limit). [1,2] |
| The American Association for the Study of Liver Disease practice guideline, Management of Adult Patients with Ascites Due to Cirrhosis (Update 2012) lists testing for ascitic fluid LDH as “optional (where there is suspicion of infection).” [3] |
| The serum-ascites albumin gradient demonstrates superior performance over either ascitic fluid LDH or ascites-to-serum LDH ratio for the differentiation of peritoneal transudates from exudates. [4,5,6] |
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| References | [1] Runyon BA, Hoefs JC. 1984. Ascitic fluid analysis in the differentiation of spontaneous bacterial peritonitis from gastrointestinal tract perforation into ascitic fluid. Hepatology. 4(3):447-450. |
| [2] Block DR, Franke DDH. Quick Guide to Body Fluid Testing. AACC Press (Washington, DC), 2015. ISBN 978-1-59425-180-1. |
| [3] Runyon BA. 2012. Practice Guideline. Management of Adult Patients with Ascites Due to Cirrhosis: Update 2012. American Association for the Study of Liver Diseases. |
| [4] Runyon BA, Montano AA, Akriviadis EA, Antillon MR, Irving MA, McHutchison JG. 1992. The serum-ascites albumin gradient is superior to the exudate-transudate concept in the differential diagnosis of ascites. Ann Int Med. 117(3):215-20. |
| [5] Akriviadis EA, Kapnias D, Hadjigavriel M, Mitsiou A, Goulis J. 1996. Serum/ascites albumin gradient: its value as a rational approach to the differential diagnosis of ascites. Scand J Gastroenterol. 31(8):814-7. |
| [6] Karcher DS, McPherson RA. Chapter 29: Cerebrospinal, synovial, serous body fluids, and alternative specimens. In Henry’s Clinical Diagnosis and Management by Laboratory Methods. 22nd Ed. McPherson RA, Pincus MR. Eds. Elsevier Saunders: Philadelphia, PA, 2011. ISBN: 1437709745. |
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| **Pleural Fluid LDH** | |
| Clinical Indications | Supportive evidence for differentiation of exudates and transudates |
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| Reference Interval and/or Interpretive Information | Light’s criteria can be used to identify most pleural exudative effusions if one or more of the following criteria are present: pleural fluid-to-serum protein ratio of >0.5, pleural fluid-to-serum LDH ratio of >0.6, or a pleural fluid LDH activity that is >2/3 the upper limit of a normal serum LDH activity. [1,2,3,4] |
| Heart failure associated misclassifications (by Light’s criteria) may be differentiated as trasudative effusions by subsequently evaluating a serum-to-pleural albumin gradient (>1.2 g/dL) and/or a serum-to-fluid protein gradient (>3.1 g/dL). [3,5] |
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| References | [1] Light RW, MacGregor MI, Luchsinger PC, Ball WC. 1972. Pleural effusions: the diagnostic separation of transudates and exudates. Annals of Internal Medicine. 77:507-513. |
| [2] Hooper C, Lee YCG, Maskell N, on behalf of the BTS Pleural Guideline Group. 2010. Investigation of a unilateral pleural effusion in adults: British Thoracic Society pleural disease guideline 2010. Thorax. 65(Suppl 2):ii4-ii17. |
| [3] Porcel JM, Light RW. 2006. Diagnostic approach to pleural fluids in adults. American Family Physician. 73(7):1211-1220. |
| [4] Karcher DS, McPherson RA. Chapter 29: Cerebrospinal, synovial, serous body fluids, and alternative specimens. In Henry’s Clinical Diagnosis and Management by Laboratory Methods. 22nd Ed. McPherson RA, Pincus MR. Eds. Elsevier Saunders: Philadelphia, PA, 2011. ISBN: 1437709745. |
| [5] Porcel JM. 2013. Identifying transudates misclassified by Light’s criteria. Curr Opin Pulm Med. 19:362-367. |
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| **Synovial Fluid LDH** | |
| Clinical Indications | Synovial fluid evaluation |
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| Reference Interval and/or Interpretive Information | Elevations in synovial fluid LDH activity (typically >250 U/L) have been associated with both noninfectious (inflammatory arthritis, crystal arthritis) and infectious (septic) arthritis. [1,2,3,4,5] |
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| [2] Margaretten ME, Kohlwes J, Moore D, Bent S. 2007. Does this adult patient have septic arthritis? JAMA. 297(13):1478-1488. |
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| [4] Couturier MR, Straseski JA, Kjeldsberg CR. Chapter 7: Synovial fluid. In Kjeldsberg’s Body Fluid Analysis. Hussong JW and Kjeldsberg CR, Eds. ASCP Press: Chicago, IL, 2015. ISBN: 978-089189-5824. |
| [5] Shmerling RH, Delbanco TL, Tosteson ANA, Trentham DE. 1990. Synovial fluid tests: what should be ordered? JAMA. 264(8):1009-1014. |
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| https://www.aruplab.com/bodyfluids | |