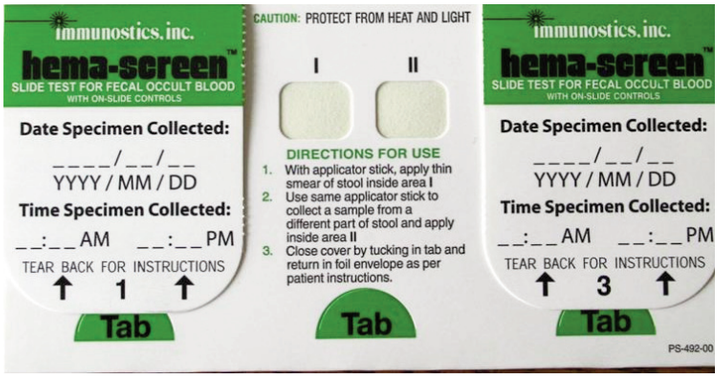
LifeLabs® Medical Laboratory Services

Inside Diagnostics



ColonCancerCheck REQUISITIONS REQUIRED

As you know primary screening of normal risk individuals using Fecal Occult Blood Testing (FOBT) commenced in April 2008.

Most cards are mailed back to testing laboratories by participants, which represents a new model for Ontario.

Laboratories are receiving up to 20% of cards without a requisition or with a requisition so incomplete it is impossible to identify the screened individual or responsible clinician.

Under these circumstances specimens cannot be tested. This represents a tremendous waste which will significantly impact the success of the program should the problem continue.

Please ensure your patients participating in ColonCancerCheck have a properly completed OHIP requisition (do not include other tests) and that they understand the requisition must be mailed back with the card once they have placed specimens under all flaps. ■

IN THIS ISSUE

WHEN HEMOGLOBIN VALUES DIFFER BETWEEN LABORATORIES

On occasion, our laboratory is contacted because of a discrepancy between our results and those of another laboratory. This usually involves situations where our reported hemoglobin value for a nursing home patient is lower than a hospital's hemoglobin value, resulting in cancellation of a planned transfusion, and unnecessary transport of the patient. It is clear that such an occurrence is frustrating to patients, their families, nursing home staff, and attending physicians.

At LifeLabs, we take these discrepancies very seriously. It is our strict policy not to release any results unless all quality control checks are satisfied. To further insure the accuracy of our results, we have recently conducted two studies comparing our hemoglobin values with those provided by two laboratories, each using a different brand of analyzer. These studies have shown an excellent agreement between hemoglobin values, indicating a high degree of accuracy of our results. Furthermore, monthly comparisons of quality control data collected from approximately 700 North American users of the same analyzer type repeatedly show optimal performance by our analyzers. Where available, delta checks with previously measured patient values have shown consistency of our results.

It can be concluded that analytical causes for these discrepancies can be excluded and that pre-analytical variables must be at play. These include changes in the

hydration status of the patient, poor specimen integrity, difficulty in venipuncture, and rarely, mislabeling of the tubes. These events can occur in the community or in a hospital environment.

In order to avoid transferring patients unnecessarily, it is suggested that a second blood sample be obtained to confirm the hemoglobin result. In addition, given the strict hospital transfusion guidelines, hemoglobin results very close to the transfusion threshold value may not be sufficient to trigger a transfusion order by the receiving hospital. Finally, hospitals should insure absence of pre-analytical causes by retesting a new specimen, whenever their initial results depart markedly from those obtained in the community, and do so prior to returning patients to their residences. ■

COMMUNICATION WITH CLINICIANS: ARE WE UP TO DATE?

Our objective at LifeLabs is to effectively deliver diagnostic information by a variety of modalities and offer choice to our clients.

For routine reporting we offer:
- Hard copy delivery
- iLablink electronic reporting
- Result integration into Clinical Management Systems
- AutoFax (in a limited number of situations)

For expedited reporting:
- We are required to directly communicate "Critical Values" by telephone
- ASAP, Urgent and "Alert" results may be called but can also be delivered by fax in many cases

An increasing number of clinicians carry wireless personal digital assistants (PDAs) and it occurs to us that, providing security and privacy concerns are addressed, communication by email may be a more effective and less intrusive means of expedited reporting than those currently offered.

The purpose of this note is to attempt to gauge the level of interest in expedited reporting by encrypted email. If you are interested in this option please email a brief message to surveys@LifeLabs.com. Blackberries welcome! ■

MEASLES

Measles is caused by the rubeola virus. It is a vaccine preventable infection. The incidence of measles has decreased significantly in North America with the development of the live vaccine. However, outbreaks have occurred in Europe in 2007-08 and in Toronto and other municipalities in Ontario currently. Transmission of measles occurs when non-immune people are exposed to the acute infection.

Acute measles is characterized by a prodromal phase of fever, malaise, runny nose, conjunctivitis and cough. An erythematous, maculopapular rash begins after the prodrome. It usually begins on the face, going to the body and then the extremities. Koplik's spots are pathognomonic of measles and occur just before the development of the rash. Most people with acute measles feel better within 7-10 days. Complications include pneumonia and otitis media and bacterial superinfection at these sites can occur. Encephalitis, a severe complication, occurs in approximately 1 of every 1,000 reported cases. Individuals who are immunocompromised are more likely to develop severe complications and the mortality rate is significantly higher. Pregnant women and infants are also at risk for more severe illness. Although measles has not been associated with congenital anomalies, measles in pregnancy is associated with an increase in spontaneous abortion and premature delivery.

The following laboratory tests are used to diagnosis acute measles:
1) acute serology (Measles IgM and IgG),
2) Virus isolation (nasopharyngeal swab, throat swab or urine),
3) convalescent serology (Measles IgG). For further information refer to the website in the references below.

Acute measles is highly contagious. It can be spread by airborne, droplet and by direct contact. The incubation period is 10-14 days and the infectious period is usually four days before and four days after the rash. **Because measles is highly contagious, clinicians caring for patients who are suspected of having acute measles and who need laboratory tests, must call LifeLabs at the number usually called to schedule a home visit or 1-877-849-3637 to set up a home visit for phlebotomy. An appointment at the end of the day at a patient collection centre may also be booked. These measures are designed to protect other patients and our staff.** This applies to other airborne infections such as pulmonary tuberculosis, acute varicella, or disseminated zoster.

Acute measles is a reportable disease (Ontario Regs 559/91). If you suspect acute measles, notify your local public health unit. ■

REFERENCES:

1. Laboratory Testing for Suspect Measles Cases, Ontario Ministry of Health and Long Term Care: http://www.health.gov.on.ca/english/providers/pub/labs/measles_lab%20testing_fs_20080409.pdf
2. Infectious Diseases News Brief. CCDR Weekly, April 25, 2008.
3. Measles Virus. Principles and Practice of Infectious Disease 6th edition. Eds GL Mandell, JE Bennett, R. Dolin.
4. Measles Surveillance Protocol for Ontario Hospitals. Ontario Hospital Assocation, Publication 219. June 2007.

LYMPHOCYTE MARKER ANALYSIS BY FLOW CYTOMETRY

Precise ordering is necessary

Three lymphocyte marker analyses by flow cytometry are available through LifeLabs. These are CD4/CD8 absolute count and ratio enumeration, lymphoproliferative disorder phenotyping, and acute leukemia phenotyping. In order to provide you with the right diagnostic information it is essential the correct test is clearly ordered. To that end, a specific LifeLabs requisition has been created. In addition, the diagnosis or the reason for ordering the test is required by the laboratory. The latter allows the laboratory to choose the appropriate markers (antibodies) when performing the analysis requested.

LifeLabs

LifeLabs form label here

REQUEST FOR LYMPHOCYTE MARKER ANALYSIS BY FLOW CYTOMETRY

Patient's Name:
Patient's D.O.B.:
Date of Collection: Time of Collection:
Requesting Physician:
Physician's Phone #:
Specify Reason for Test or Diagnosis: *("Lymphocyte Markers" is not acceptable as a reason or diagnosis)*

Please check one of the following:

☐ **Absolute CD4, CD8 counts and CD4/CD8 ratio (TR#788)**
Collect Monday-Thursday.
Send one (1) EDTA tube (Lavender top) of blood.
Store and ship at room temperature.

or

☐ **Lymphoproliferative Disorder Phenotyping (TR#99G)**
Collect Monday-Wednesday.
Send one (1) EDTA tube (Lavender top) of blood.
Store and ship at room temperature.

or

☐ **Acute Leukemias (TR#99G)**
Collect Monday-Wednesday.
Send one (1) EDTA tube (Lavender top) of blood.
Store and ship at room temperature.

This form MUST accompany specimen to the testing Laboratory.
Reason or diagnosis MUST be provided.

Please ensure that the form is properly completed as follows:

1) Patient's name and date of birth
2) Requesting physician's name and phone number
3) Date and time of collection (if collected in your office)
4) Reason for test or diagnosis. For example, "Lymphocytosis, rule out C.L.L." or "Rule out Lymphoproliferative Disorder or Disease" or "Query Acute Leukemia". **Please do not state "Lymphocyte Markers" or "Flow Cytometry" as the reason**
5) Choose the type of analysis by checking a single box ONLY. Because of stability issues, blood should be collected Monday to Wednesday only, except for CD4/CD8 counts and ratio which can be collected Monday to Thursday.

Blood will not be collected at our Patient Service Centres and specimens will be rejected and not processed without the required properly completed requisition. ■

[*The "LYMPHOCYTE MARKER ANALYSIS BY FLOW CYTOMETRY"* form can be requested on the Physician Phlebotomy Order form and is also available at www.lifelabs.com]

LEUKOCYTE ALKALINE PHOSPHATASE TEST (LAP): RECENTLY DISCONTINUED

From time to time we re-evaluate our test menu with a view to introducing new technologies and removing tests that have become obsolete. The LAP score is an example of such a test.

Historically, the LAP test has been used in the evaluation of neutrophilic leucocytosis. A high LAP score is suggestive of an infectious/inflammatory disorder, or a myeloproliferative disorder (e.g. polycythemia rubra vera). On the other hand, a low LAP score is seen in 90% or more of cases of chronic myelogenous leukemia (CML), in paroxysmal nocturnal hemoglobinuria, in hypophosphatasia, in one fourth of cases of idiopathic myelofibrosis, and in patients using androgens.

Advances in molecular diagnosis have revolutionized the assessment of myeloproliferative disorders. These molecular tests can be done rapidly on peripheral blood samples. The JAK 2 V617F mutation is present in 90-95% of patients with polycythemia rubra vera, and 50-55% of patients with essential thrombocythemia. The new diagnostic criteria for polycythemia rubra vera no longer include the LAP score. Similarly, all cases of typical CML are positive for the Bcr/Abl molecular translocation.

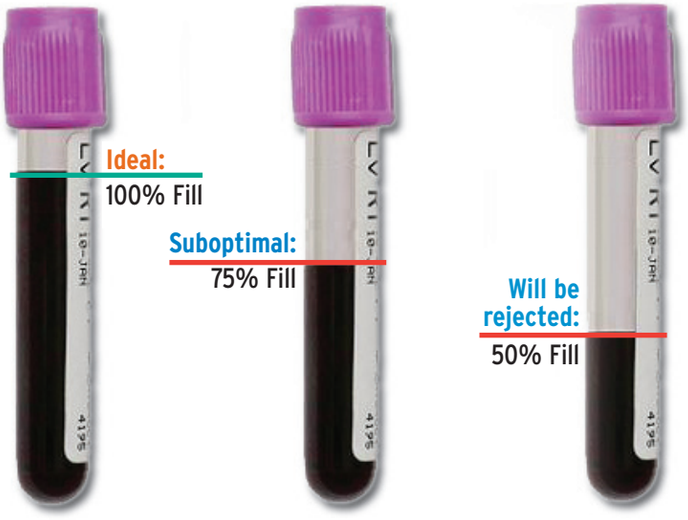
Therefore, given these new developments, the lack of specificity of a low or a high LAP score, the lack of a 100% sensitivity for CML, and the absence of external proficiency programs, a decision has been made to discontinue this test. To order the above molecular tests, please obtain a Cytogenetics & Molecular Diagnostics Laboratories requisition from Toronto Medical Laboratories (TML) by calling 416-340-4800 ext. 5739. ■

REFERENCES:

1. Lichtman, M.A. et al. (Eds.). (2006). Williams Hematology (7th ed.). New York: McGraw-Hill.

2. Tefferi, A., Gilliland, D.G. (2005). The JAK2 V617F Tyrosine Kinase Mutation in Myeloproliferative Disorders: Status Report and Immediate Implications for Disease Classification and Diagnosis. Mayo Clin Proc 80(7): 947-958.

CLARIFICATION OF THE ACCEPTABLE FILL VOLUME FOR EDTA TUBES (CBC, ESR)



The ideal fill volume for EDTA tubes is 90% or greater. Lower fill volumes result in a higher final EDTA concentration. This in turn may cause changes to cell morphology and red blood cell size, with the latter resulting in possible changes to the Hematocrit, MCV, and other red cell indices. The ESR may also be affected.

Samples with less than 50% fill volume will not be analyzed and will be rejected. Samples with fill volumes between 50% and 90% will not be rejected. Instead, they will be analyzed and the results provided with a message indicating that they may be inaccurate.

When blood is drawn in the office, please allow sufficient time for the vacuum effect to completely fill the tube. To assist you in this determination, we have provided picture images of 100%, 75%, and 50% filled tubes for reference. ■

FREE PSA – SHOULD NOT BE ADDED FOLLOWING ANALYSIS FOR TOTAL PSA

Measurement of serum prostate-specific antigen (PSA) is widely used to aid in the early detection of prostate cancer. Many strategies have been developed to increase the clinical specificity of the PSA test, including the use of Free PSA. Free PSA is the fraction of PSA not bound to serum proteins. Many papers have been published in the literature that show that the measurement of Free PSA and, more specifically the ratio of Free to Total PSA, improves the specificity of prostate cancer screening when the initial is elevated. The lower the ratio of Free to Total PSA, the higher the probability of prostate cancer.

It is recommended that Free PSA be ordered as a follow-up test when the initial Total PSA result falls within the range of 4.0-10.0 µg/L.

The stability and, therefore, storage conditions of samples for Total and Free PSA are not the same. Samples initially analyzed for Total PSA are not stored in conditions ideal to ensure the stability of Free PSA. Therefore, the addition of a Free PSA test on the same sample collected for the initial Total PSA measurement is **not** recommended. Rather, the patient should be instructed to have a second sample collected at a later date. ■

REFERENCES:

1. Catalona WJ, Smith DS, Wolfert RL, Wang TJ, Rittenhouse HG, Ratliff TL, Nadler RB. Evaluation of Percentage of Free Serum Prostate-Specific Antigen to Improve Specificity of Prostatic Cancer Screening. *JAMA* (1995) 274: 1214-1220.
2. Junker R, Brandt B, Zechel C, Assman G. Comparison of prostate-specific antigen (PSA) measured by four combinations of free PSA and total PSA assays. *Clin Chem* (1997) 43: 1588-1594.

VITAMIN D ANALYSIS

Due to increased request volumes for vitamin D analysis, LifeLabs is experiencing delays in processing serums for this analyte and a turn around time of 3 weeks should be anticipated. The laboratory is presently taking several operational steps to improve this service issue. We thank you for your patience at this time. ■

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