Molecular Center of Excellence

Saint Luke’s Hospital has signed a five-year strategic alliance agreement with Roche Diagnostics to establish a Molecular Center of Excellence. This agreement positions our laboratory to become an even earlier adopter of advanced molecular diagnostic testing. In 2004, the Molecular Diagnostics Laboratory will install new instrumentation to automate the extraction of DNA from tissues, blood and body fluids. This automation will greatly increase the testing capacity of the laboratory. New molecular assays for bcr-abl, VRE, MRSA, VZV, HPV and Group B Strep are under consideration. In the more distant future, DNA microarrays for the diagnosis of leukemia and lymphoma and the assessment of risk for developing coronary artery disease, stroke and osteoporosis will become available.

Please contact one of the Clinical Pathologists if you would like a particular molecular assay set up.

PCR for Enteroviral Meningitis Now Offered In-House

Enteroviruses are found worldwide and throughout the year, although in temperate climates infections are more prevalent in summer and fall. Enterovirus is the most common cause of aseptic meningitis, and accounts for almost all viruses isolated from spinal fluid. The sensitivity of viral culture of cerebrospinal fluid (CSF) for enterovirus is 30 to 75% and an average of 7 days is required for isolation. Thus, viral culture is not an optimal test in the evaluation of meningitis. Alternatively, enterovirus PCR has become standard practice due to its much improved sensitivity and turnaround time. Several studies have demonstrated the positive impact of PCR in the management of patients hospitalized for meningitis. For example, one study demonstrated that pediatric inpatients who had PCR done prior to discharge had significantly fewer ancillary tests ordered, less antibiotic use, and shorter hospital stays.

Enterovirus PCR testing has been available from a reference laboratory with a turnaround time of 2 to 3 days. Effective immediately, Saint Luke’s Regional Laboratories will begin performing enterovirus PCR in-house on CSF specimens. Testing will be performed Monday through Saturday, with results available within 24 hours. Specimen requirement is 1 mL CSF submitted in a sterile, screw-capped tube. The specimen should be refrigerated if transportation will be delayed. Specimens grossly contaminated with blood may inhibit PCR and cause false-negative results.

Is There Mercury in Your Fish Oil?

The American Heart Association has recommended that all patients with known coronary heart disease consume about 1 g of omega-3 fatty acids per day and that patients without known disease consume at least 500 mg per day (Circulation 2002; 106:2747-57). This recommendation can be achieved by consuming two to four fish meals per week or 500 to 1000 mg of fish oil capsules per day. Cold-water fish such as salmon, swordfish, shark, sardines, mackerel, tuna and herring are richest in omega-3 fatty acids.

Recently, the FDA issued a health advisory concerning unsafe levels of mercury in these fish. Pregnant women, women of childbearing age, nursing mothers and young children were advised to limit consumption of cold water fish to 12 ounces per week. Blood mercury levels are approximately 2.0 ug/L in individuals who do not consume fish and >8 ug/L in those consuming more than two fish meals per week. Chronic exposure to mercury may lead to the classic triad of tremors, gingivitis and erethism. The nervous system of a developing fetus or young child can be damaged. High levels of mercury may negate the cardiovascular benefits of consuming fish, because coronary vessels are injured by increased free radical production, inactivation of antioxidant enzymes and platelet activation.

Fish oil capsules have been widely marketed as a substitute for fish consumption. However, none of these products list their mercury content. Investigators at Massachusetts General Hospital...
recently measured the mercury content of 5 popular brands of over the counter fish oil capsules (Arch Pathol Lab Med. 2003;127:1603-5). The 5 supplements had negligible amounts of mercury, suggesting either that mercury is removed during the manufacturing of purified fish oil or that the fish sources used in these commercial preparations are relatively free of mercury. Due to the much lower mercury concentration in commercial fish oil preparations, use of fish oil capsules may be preferable to consuming large amounts of cold-water fish.

**Rapid Mycoplasma pneumoniae Serology**

Mycoplasmas are the smallest free-living organisms. Their genome size is only 10-15% of that of common bacteria and they lack the genes necessary for cell wall synthesis. *Mycoplasma pneumoniae* is estimated to cause up to 20% of atypical pneumonia cases.

The classic serologic method of diagnosis is measurement of cold agglutinins. A cold agglutinin titer of ≥1:32 in the appropriate setting is considered indicative of infection. However, the sensitivity of the cold agglutinin test is low, approximately 50%. The specificity is also low since cold agglutinins are an acute phase reactant and may be seen in a variety of diseases, such as autoimmune disorders, dysproteinemic states, other atypical pneumonias including legionellosis, mononucleosis caused by cytomegalovirus or Epstein-Barr virus, and lymphoma. Although isolation of *M. pneumoniae* from respiratory specimens is possible, growth usually requires 1-2 weeks, which limits the clinical utility of culture.

Specific serological tests for IgM and IgG antibodies to *M. pneumoniae* are the preferred method of diagnosis. Both immunofluorescence and enzyme immunoassays are available and have sensitivities and specificities >90%. The presence of IgM antibodies or a fourfold or greater rise in IgG antibody between paired sera indicates recent infection. Both culture and *M. pneumoniae* specific antibodies are available through Saint Luke’s Regional Laboratories. *M. pneumoniae* IgM is a rapid assay that is performed the same day the specimen is received. *M. pneumoniae* IgG antibody is performed weekly. Specimen requirement is one plain red top tube of blood.

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**Frantic Flu**

The CDC reported influenza A to be at epidemic levels during the month of December 2003. During the week of December 20, 48 states had widespread disease. Saint Luke’s Hospital Microbiology Laboratory performed rapid influenza testing on 298 specimens in December, with 63 positive results for influenza A. An additional 12 influenza A viruses have been recovered from culture. Influenza cases have been declining since the first of January.

**First Report of vCJD from Transfusion**

The United Kingdom Health Secretary has reported the world’s first possible case of variant Creutzfeldt Jakob disease (vCJD) by transfusion of red blood cells. The blood donor, who was free of symptoms at the time of donation, donated in March 1996. The donor developed vCJD in 1999 and eventually died from it. The recipient was transfused with the unit of blood during surgery in 1996 and died from vCJD in the autumn of 2003.

To date, the United Kingdom has reported 143 known cases of vCJD. At least 15 other people are known to have received blood from donors who subsequently developed vCJD. So far none has yet developed the disease, but all recipients are being notified and counseled.

Since 1998, the UK has used only leukocyte reduced blood because experts on prion diseases consider white blood cells to be a potential source of infection. This is one of many reasons why the Saint Luke’s Health System provides only leukocyte reduced red blood cells for transfusion.

**Cutaneous Leishmaniasis in Iraqi Troops**

More than 150 soldiers in Iraq have been diagnosed with cutaneous Leishmaniasis. The incubation period is usually weeks or months, but lesions may not appear for several years after a person leaves an endemic area. The most common presentation is single or multiple nodules or ulcers. The preferred specimen is tissue obtained by scraping the ulcer bed with a scalpel blade.