

# Lab Updates

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July 2006

## SPUTUM CULTURE SPECIMEN COLLECTION

Detection of squamous epithelial cells (SECs) by sputum Gram stain indicates that the specimen was contaminated with oro-pharyngeal secretions. Therefore, cultures of such specimens typically yield organisms that colonize the upper respiratory tract rather than organisms that may be causing lower respiratory tract infection. The predictive value of these cultures is poor and may lead to inappropriate antimicrobial therapy. This is particularly true for expectorated sputum specimens.

Beginning on August 14, the laboratory will not perform culture on expectorated sputum samples that show >10 SECs/low-power field on Gram stain, in order to comply with laboratory accreditation requirements, as well as published recommendations.

On the other hand, endotracheal aspirate specimens will be handled in a slightly different way. They will not be cultured if >10 SECs/low power field are seen and Gram stain also reveals NO ORGANISMS SEEN and NO PMNs (polymorphonuclear leukocytes).

For unacceptable specimens, the reason that culture was not performed will be indicated as a comment in the final report.

Note: Special protocols are available for detection of Unusual Pathogens, like *Legionella*, *C. neoformans* and *Bordetella*. Specific cultures should be ordered when Unusual Pathogens are suspected. Also, Acceptability Criteria do not apply to specimens submitted to screen for the presence of specific pathogens, for cystic fibrosis cultures, *etc.*

Application of these Acceptability Criteria should improve patient care by minimizing the possibility of antimicrobial treatment based on contaminants isolated in culture.

If you have questions, comments or suggestions, please contact:  
Dr. Mike Mitchell, Director, at 508-334-7160 or via email at ([mitchelm@ummhc.org](mailto:mitchelm@ummhc.org)).

## NEW TEST: PROTEIN-CREATININE RATIO

Proteinuria is recognized as an independent risk factor for cardiovascular and renal disease and as a predictor of end organ damage. Effective August 7, Protein-Creatinine Ratio will be available. The sample requirement is 10 ml first morning or random urine. The normal range is <200 mg/g creatinine.

## **National Kidney Foundation Guideline 5: Assessment of Proteinuria**

### **Guidelines for Adults and Children**

- Under most circumstances, untimed (spot) urine samples should be used to detect and monitor proteinuria in children and adults.
- It is usually not necessary to obtain a timed urine collection (overnight or 24-hour) for these evaluations in either children or adults.
- First morning specimens are preferred, but random specimens are acceptable if first morning specimens are not available.
- In most cases, screening with urine dipsticks is acceptable for detecting proteinuria:
  - Standard urine dipsticks are acceptable for detecting increased total urine protein.
  - Albumin specific dipsticks are acceptable for detecting albuminuria.
- Patients with a positive dipstick test (1<sup>+</sup> or greater) should undergo confirmation of proteinuria by a quantitative measurement (protein-to-creatinine ratio or albumin-to-creatinine ratio) within 3 months.
- Patients with two or more positive quantitative tests temporally spaced by 1 to 2 weeks should be diagnosed as having persistent proteinuria and undergo further evaluation and management for chronic kidney disease.
- Monitoring proteinuria in patients with chronic kidney disease should be performed using quantitative measurements.

### **Specific Guidelines for Adults**

- When screening adults at increased risk for chronic kidney disease, albumin should be measured in a spot urine sample using either:
  - a. Albumin specific dipstick
  - b. Albumin-to-creatinine ratio
- When monitoring proteinuria in adults with chronic kidney disease, the protein-to-creatinine ratio in spot urine samples should be measured using:
  - a. Albumin-to-creatinine ratio
  - b. Total protein-to-creatinine ratio is acceptable if albumin-to-creatinine ratio is high (>500 to 1,000 mg/g)

### **Specific Guidelines for Children Without Diabetes**

- When screening children for chronic kidney disease, total urine protein should be measured in a spot urine sample using either:
  - Standard urine dipstick
  - Total protein-to-creatinine ratio
- Orthostatic proteinuria must be excluded by repeat measurement on a first morning specimen if the initial finding of proteinuria was obtained on a random specimen.
- When monitoring proteinuria in children with chronic kidney disease, the total protein-to-creatinine ratio should be measured in spot urine specimens.

### **Specific Guidelines for Children With Diabetes**

- Screening and monitoring of post-pubertal children with diabetes of 5 or more years of duration should follow the guidelines for adults.
- Screening and monitoring other children with diabetes should follow the guidelines for children without diabetes.

## **CHANGES IN LIPOPROTEIN-a TESTING**

Lp (a) is a lipoprotein particle found in the bloodstream. The structure of the Lp (a) particle is very similar to an LDL particle linked to a plasminogen molecule. Plasminogen is involved in dissolving blood clots. The function of Lp (a) is unknown. Lp (a) is an independent risk factor for heart disease. Individuals with elevated Lp (a) are definitely at an elevated risk of developing atherosclerosis. Whether Lp (a) is directly involved in the atherogenic process has not been determined.

Lp (a) levels will remain fairly constant in an individual over a lifetime but they will be slightly lower in men, and they will rise a bit higher in postmenopausal women. The distribution of Lp (a) also varies between racial groups. Lp (a) levels are normally distributed in African American populations, however, Caucasian, Eastern Asian, and Asian Indian populations have Lp (a) distributions that are skewed towards lower levels. According to the Framingham Heart Study, the 90th percentile of Lp (a) levels is 39 mg/dL in men and 39.5 mg/dl dL in women. African Americans have somewhat higher values than Caucasians. Lp (a) levels above 30 mg/dl represent a twofold relative risk for the development of atherosclerotic disease.

Effective August 21, 2006, Lp (a) testing will be performed on site using rate nephelometry technology. This change will greatly improve overall turn around time for this testing. There are no changes in sample collection requirements and reference range.

## **RECOMMENDATIONS FOR SPECIMEN COLLECTION AND PROCESSING**

**Carcinogenic embryonic antigen:** The manufacturer of the assay has recently confirmed that CEA test results may generate decreased values with certain frozen specimens. We recommend that you do not freeze specimens prior to analysis.

**Vitamin B12:** Due to the unstable nature of the Vitamin B12, we recommend that serum specimens should be frozen immediately and protected from light after separation.

**Folate:** Due to the unstable nature of Folate, samples should be protected from light to prevent deterioration. We recommend that samples for Folate testing be submitted wrapped in foil.

If you have questions, comments or suggestions, please contact:

Dr. L.V. Rao, Director, at 508-334-7593 or via email at [RaoL@ummhc.org](mailto:RaoL@ummhc.org)

Ms. Judy Rennell, Manager, at 508-334-3803 or via email at [Rennellj@ummhc.org](mailto:Rennellj@ummhc.org)

Ms. Rachel Ambacher, Manager, at 508-334-7316 or via email at [Ambacher@ummhc.org](mailto:Ambacher@ummhc.org).

## **WORK UP FOR A PATIENT WITH SUSPECTED HEMOSTATIC DIATHESIS**

The Coagulation Laboratory at UMass Memorial suggests the following schema for the work up of patients with a suspected hemostatic defect:

1) Start with a personal and family bleeding history, and obtain a PT and PTT.

In the presence of normal PT and PTT and no history to suggest a coagulopathy, and especially with a history of mucosal bleeding, consider a platelet defect (thrombocytopenia) or von Willebrand's Disease (vWD). To diagnose one of the two, we suggest the following scheme:

2) If you suspect a platelet defect, order platelet aggregation. This test needs to be scheduled at least one day in advance. Ingestion of aspirin should be stopped for 10 days before the test is done, Plavix for 5 days, and other NSAID for 2-3 days. Our protocol for platelet aggregation uses 4 agonists of platelet activation: ADP, epinephrine, collagen, and arachidonic acid. It also includes a screening assay for vWD, the so-called ristocetin-induced platelet aggregation (RIPA). This is a qualitative test for vWD that may also separate vWD type 2b or platelet-type vWD from all other types of the disease. If the platelet aggregation demonstrates an abnormality, a thrombocytopathy is likely present. If the platelet aggregation is normal, but RIPA is abnormal, go to step 2b.

2b) If the history suggests vWD (or if RIPA is abnormal), the following 3 tests are suggested: ristocetin co-factor, a quantitative assay for the von Willebrand's factor (vWF); factor VIII coagulant (decreased in vWD); and vWF antigen. If the diagnosis of vWD is established, go to step 3. Please note that patients with blood type 0 run approximately 20% lower values for vWF. If both the platelet aggregation and the vWF are normal, the etiology for bleeding may be different (normal variant, psychogenic purpura).

3) VWF multimers should be ordered only when a diagnosis of vWD has been established by the tests suggested above. The purpose of this test is to establish the subtype of the disease, because it may affect therapy. Please note that the vWF multimers assay is not an initial diagnostic test for vWD, especially since the multimers may be affected by other conditions, such as TTP, HUS, acquired cardiac defects, and others. Moreover, the methodology used is not FDA approved and it is not well standardized.

For any questions, consultations, or discussion of results, please contact:  
Dr. Liberto Pechet, Director, at 508-334-0265, or via email at [PechetL@ummmc.org](mailto:PechetL@ummmc.org)  
Diane Connor, Manager, at 508 334 7153, or via email at [ConnorD@ummmc.org](mailto:ConnorD@ummmc.org)

### **SEDIMENTATION RATE METHODOLOGY CHANGE**

Effective September 11, 2006, sedimentation rates will be performed using the Streck ESR-Auto Plus. It is an automated erythrocyte sedimentation rate analyzer designed exclusively for the analysis of sed rates.

The new reference range is 0-20 mm/hr for both genders. The old reference range was females 0-15 mm/hr, and males 0-10 mm/hr.

Until late September the lab will perform both methods. Please start ordering the new tubes (ESR-Vacuum tube) as of September 4, 2006. After September 11, 2006 please return all Vesmatic tubes (old tubes) to UMass Memorial Laboratories, attention Victor Nozzolillo.

Draw the ESR-Vacuum tube to the white fill line. Mix immediately after drawing the patient sample by inverting the tube at least 6 to 8 times. The air bubble in the tube must reach the opposite end of the tube between every inversion. Hold the tube at an angle of about 35° to enhance mixing. The mixing is very important, if not mixed properly clots will form resulting in cancellation of the test. Refrigerate specimen and send to lab for processing. ESR-Vacuum Tube if refrigerated is stable for 24 hours.

## REFERENCE RANGE CHANGES

Effective date July 10, 2006, please note the following changes in reference ranges for Anti Xa LMW Heparin.

The current reference ranges for anti-Xa LMW Heparin are:

Therapeutic level	0.5 to 1.2 IU/mL
Peak level	<1.5 IU/mL
Trough level	0.5 to 0.8 IU/mL
Prophylactic level	0.1 to 0.3 IU/mL

Notes: Draw peak level 3 to 5 hours after S.C. administration  
Draw trough level 30 minutes before next dose.

The new reference ranges for anti-Xa LMW Heparin:

- a) Therapeutic enoxaparin (Lovenox) given twice daily  
Peak therapeutic level 0.6-1 units/mL  
\*Trough therapeutic level
- b) Therapeutic enoxaparin (Lovenox) given once daily  
Peak therapeutic level 0.8-1.6 units/mL  
\*Trough therapeutic level
- c) Prophylactic enoxaparin (Lovenox) given once or twice daily  
Peak prophylactic level not to exceed 0.5 units/mL  
Trough prophylactic level not to fall below 0.1 units/mL

Notes: Draw peak levels 4 hours after subcutaneous administration  
Draw trough level 30 minutes before next dose

\* Trough therapeutic levels are not well established in the literature, but may be necessary in select cases to determine dosing interval. Contact Anticoagulation Team (pager #6628) for guidance.

Consider monitoring anti-Xa LMW levels in the following patients:

1. Renal insufficiency (CrCl  $\leq$  30 mL/min)
2. Pregnancy
3. Morbid Obesity
4. Weight < 50 kg
5. Thermal injuries
6. Pediatric

## CRITICAL VALUE CHANGES

Effective August 1, 2006, the following changes will be made involving critical values:

Test	Current Critical Value	New Critical Value
Hematocrit	$\leq$ 20% (all ages)	$\leq$ 22% (18 yrs and older)
Hemoglobin	$\leq$ 6.9 g/dL (all ages)	$\leq$ 7.0 g/dL (18 yrs and older)
Troponin-I		$\geq$ 0.5 ng/mL, First incident within 10 days
O & P, Blood		First positive smear for pathogenic parasite(s)