Laboratory Medicine Update

November 5, 2018

Discontinuation of Ferric Chloride, Tyrosine and Keto Acid Screens

The ferric chloride, tyrosine and keto acid screening tests have been discontinued. The screening tests are no longer considered standard of care. These screening tests have been replaced by more sensitive and specific techniques such as amino and organic acid analysis.

Animal (grant) testing to Mayo

Effective immediately, Mayo Medical Laboratories will no longer test animal blood samples. Medical Laboratories is working to identify a laboratory that will perform esoteric testing on animal blood and body fluids.

New Test Catalog Website

The complete Test Catalog of UVA Medical Laboratories can now be accessed at the following location: http://www.medicalcenter.virginia.edu/medlabscatalog There is a direct link from the Medical Laboratories home page: http://www.medicalcenter.virginia.edu/medlabs Please contact Client Services at 4-LABS (434-924-5227) if you have further questions.

Changes in Coagulation Testing

1. Effective November 15, 2018, please note the following changes to the Coagulation Laboratory test menu:

   FDP (Fibrin Degradation Products, LAB761) – will no longer be available. Please order the D-Dimer for DIC evaluation (LAB313) or the D-Dimer for DVT/PE evaluation (LAB1119) if you feel the FDP is warranted.

   APCR (Activated Protein C Resistance, LAB846) – will no longer be available. Please order Factor V Leiden, PCR (LAB346) if APCR is clinically indicated.

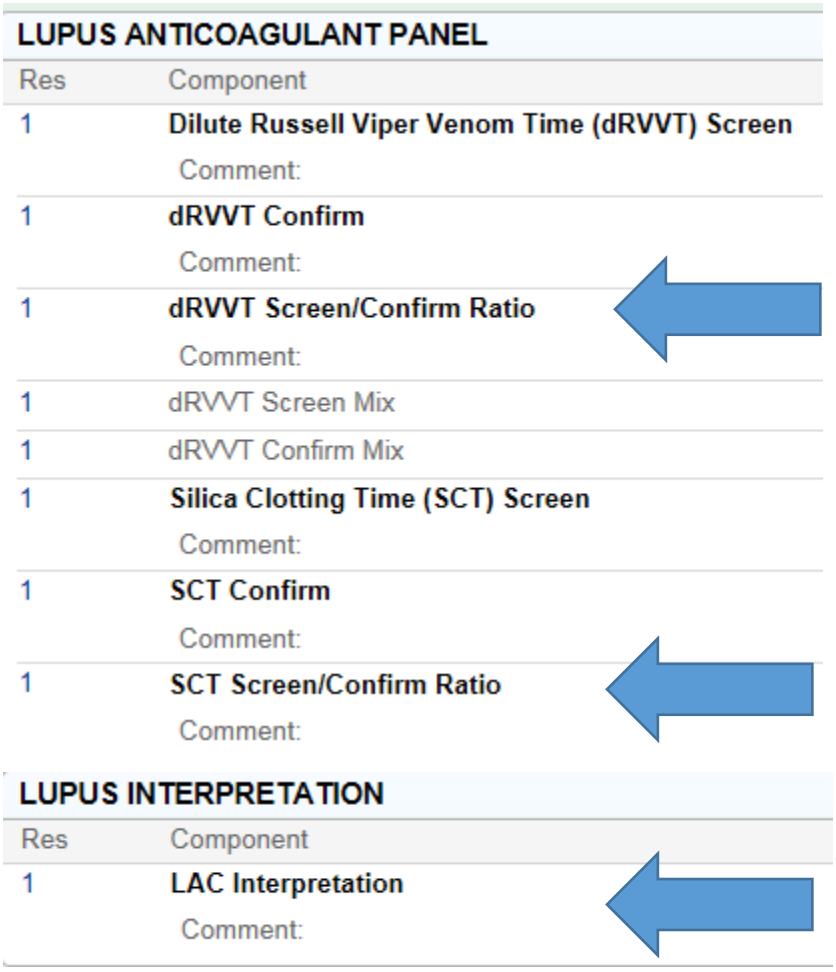
2. Platelet Function Study, Ristocetin Induced Platelet Aggregation (RIPA)

   Effective November 15, 2018 the Platelet Function Study, RIPA test will have a separate test code and be orderable in EPIC.

   The test must be scheduled 24 hours in advance. Please call the Special Coag lab at 924-8007 and refer to the EPIC procedure catalog for ordering and collection information.

3. Lupus Anticoagulant Panel – change to result reporting

   Reporting emphasis is now placed on the dRVVT Screen/Confirm Ratio, SCT Screen/Confirm Ratio and Lupus Anticoagulant Interpretation.



LUPUS ANTICOAGULANT PANEL	
Res	Component
1	**Dilute Russell Viper Venom Time (dRVVT) Screen**
	Comment:
1	**dRVVT Confirm**
	Comment:
1	**dRVVT Screen/Confirm Ratio**
	Comment:
1	dRVVT Screen Mix
1	dRVVT Confirm Mix
1	**Silica Clotting Time (SCT) Screen**
	Comment:
1	**SCT Confirm**
	Comment:
1	**SCT Screen/Confirm Ratio**
	Comment:

LUPUS INTERPRETATION	
Res	Component
1	**LAC Interpretation**
	Comment:

MICROCHIMERISM AFTER TRANSFUSION OF LARGE NUMBERS OF BLOOD PRODUCTS: A PROBLEM FOR GENETIC TESTING?

Microchimerism (MC) is the persistence of genetically distinct cell populations within a single individual. Chimerism is of course the norm in the settings of organ transplantation and allogeneic hematopoietic stem cell transplantation. Pregnancy has also been associated with MC (Bianchi et al. 1996; Rijnink et al. 2015). It is perhaps less well known that MC can occur following the transfusion of cellular blood products (Bloch et al. 2013).

Patients brought to the UVA Emergency Department following blunt or penetrating trauma are often bleeding heavily, and at risk of dying from massive blood loss. Such patients are typically transfused with large numbers of blood products, using our Massive Transfusion Protocol (MTP), as an emergent intervention to counteract the deleterious effects of large blood loss and acute traumatic coagulopathy (Simmons & Powell 2016). MTP patients are transfused with large numbers of red blood cells, platelets, plasma, and cryoprecipitate. A study (Lee et al. 2005) showed that about 15% of MTP patients exhibit evidence of long-term MC, defined as MC persisting at least two years.

There is no evidence that MC following large volume blood resuscitation *per se* is associated with deleterious long-term clinical effects. However, from a laboratory testing point of view, the observation of MC in a sizeable subset of patients raises the question: Is genetic testing of MTP patients reliable, given that such patients may have genetically distinct populations of cells in their circulation? Of particular concern is MC of white blood cells, which serve as the primary source of DNA for routine genetic testing.

UVA uses only leukocytes reduced (LR) blood; therefore, all cellular blood products transfused at UVA have had their WBC number reduced by over 99.9% at or immediately after donation. While one might predict that using only LR blood would greatly reduce the frequency of MC, MC has been observed at a frequency of around 10% of the transfused population when only LR blood products have been transfused (Hirani et al. 2014), presumably because even very small numbers of foreign WBC can proliferate to an extent sufficient for the detection of MC.

While these issues deserve consideration, we are of the opinion that MC is not likely to be a problem for genetic testing of patients that have received an MTP at UVA, for two main reasons.

First: while the frequency of MC appears to be around 10% to 15% of MTP patients, the level of MC achieved within MC-positive patients is unlikely to be sufficient to interfere with genetic testing. In patients found to be chimeric, the degree of “foreign” DNA detected ranged between 0.4% and 4.9% (Lee et al. 2005). This level is so low that it would not create confusion in the interpretation of genetic testing. The signal coming from host DNA would far exceed any signal coming from external DNA resulting from even massive transfusion.

Second: Beginning in 2017, UVA Transfusion Services adopted a policy of Universal Irradiation of all of our cellular blood products, as a safeguard against the possible development of Transfusion Associated Graft versus Host Disease (TA-GVHD), a very rare complication of blood transfusion. Irradiation stops the proliferation of white blood cells, thereby completely preventing the development of TA-GVHD. Since the development of MC following transfusion also involves the proliferation of donor white blood cells, it is readily predictable that irradiation would be completely effective in preventing the development of MC

after transfusion. That prediction has not yet been formally tested, however, as all previous studies into transfusion and MC have involved patients who received non-irradiated blood products. Nevertheless, for the above reasons, we argue that **MC resulting from transfusion poses no problem for genetic testing of patients at UVA**.

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