

Date: March 25, 2015

To: Edmonton Zone: All Physicians, Nursing Managers, Nursing Educators, Nurse Practitioners, Clinical Nurse Specialists

From: AHS Laboratory Services
Dr. Susan Nahirniak, Divisional Director of Hematopathology
Dr. Art Szkotak, Hematopathologist, University of Alberta Hospital

Re: Changes to PTT reporting resulting from a change in blood collection tubes.

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Key Messages:

- **Effective Apr. 1, 2015**, hospital blood collections in the Edmonton Zone will switch from glass “pediatric” (1.8 and 2.7 ml) tubes to plastic, for coagulation testing. Glass “adult” (4.5 ml) tubes are unaffected.
- Local validation has shown that the plastic pediatric tubes frequently cause **falsely low PTT results in patients on heparin** when compared to glass.
- Use of the plastic pediatric tubes does not affect other coagulation assays (such as PT-INR) or even the PTT in patients who are not on heparin.
- This change may also affect select **adult patients**, who are sometimes collected into pediatric tubes because they are a difficult draw or to minimize blood losses.
- All requests for a PTT which end up being drawn into a plastic pediatric tube will automatically be converted by the laboratory into a new test called a “Pediatric tube PTT”. These results can be used the same as a regular PTT in most circumstances (eg. screening for hemophilia or coagulopathy). However, the results of a **“Pediatric tube PTT” CANNOT be used to monitor heparin**. A comment indicating this fact will be appended to all “Pediatric tube PTT” results.
- For patients who routinely have blood collected into pediatric tubes, and require heparin monitoring, we recommend ordering a Heparin Level (Anti-Xa based) instead of a PTT.

Why is this change necessary:

- Previously, all “adult” (4.5 ml) and “pediatric” (1.8 and 2.7 ml) sodium citrate (blue top) tubes used to collect blood for coagulation testing in Edmonton Zone hospitals were made of glass.
- The manufacturer is discontinuing production of glass “pediatric” tubes and offering plastic as a replacement. Note that the glass “adult” (4.5 ml) tubes will continue to be supplied.

Why this is important:

- Plastic tubes appear to activate some of the platelets in the sample before it arrives in the lab resulting in release of Platelet Factor 4 (PF4) which binds to heparin, decreasing its effective concentration *in vitro*.
- Inappropriate adjustment of heparin infusion on the basis of a Pediatric tube PTT result may cause higher amounts of heparin to be administered to patients and lead to higher rates of bleeding.
- The Heparin Level (Anti-Xa based) assay is unaffected by the change in tube type because of the inclusion of dextran sulphate in its constituent reagents, which causes PF4 to disassociate from heparin.
- The following comment will be appended to all Pediatric tube PTT results: “The pediatric tube PTT CANNOT be used for heparin monitoring. If attempting to monitor heparin please request a Heparin Level.”

Inquiries and feedback may be directed to:

Dr. S. Nahirniak at 780-407-3426 or Dr. A. Szkotak at 780-407-7104 (Pager: 780-445-6795)

This bulletin has been reviewed and approved by: Dr. Susan Nahirniak