**PROTHROMBIN (PT) REAGENT CHANGE AT UNIVERSITY OF CONNECTICUT HEALTH CENTER**

**WHAT:** We will change to a new, highly sensitive reagent for PT/INR testing.

**WHEN:** The new test will be in use Thursday, February 27, 2014, at 12am.

**IMPACT:** The sensitivity of the PT to oral anticoagulant therapy with warfarin has changed. However, no major changes will be seen in the INR values. The recommended INR therapeutic ranges will remain the same. DO NOT monitor warfarin based on PT results (sec).

**NOTE:** The INR value should only be used to monitor warfarin. The INR is calibrated for standardization of prolonged PT results for warfarin therapy. The INR at UCHC has not been calibrated and standardized for prolonged PT results due to factor deficiencies and liver disease.

This PT reagent change does not apply to point-of-care instruments at the anticoagulation clinic and other locations. Please note the abnormal PT results from these instruments will NOT correlate with the PT results from the Core Laboratory.

**BACKGROUND:** The prothrombin time (PT) is used for evaluation of bleeding, detection of selected factor deficiencies, assessment of liver disease, and monitoring of oral anticoagulation (warfarin) therapy.

The reagent (known as thromboplastin) used for the PT test is derived from various sources and varies in responsiveness to a reduction of the vitamin K-dependent coagulation factors (i.e. factors II, VII, IX, and X). A patient with stable anticoagulation may have completely different PT results depending on the type and lot of thromboplastin used. To allow better monitoring of anticoagulation therapy, the World Health Organization (WHO) devised the **INR (International Normalized Ratio)** in 1983 to help standardize anticoagulant monitoring.

Reagent sensitivity is measured by the manufacturer-supplied International Sensitivity Index (ISI) which references (compares) a particular thromboplastin reagent to the W.H.O. standard (the ISI is essentially a correction factor assigned to a thromboplastin). From this an International Normalized Ratio (INR) can be computed: \( \text{INR} = \left( \frac{\text{patient PT}}{\text{mean normal population PT}} \right)^{\text{ISI}} \), which measures oral anticoagulant effect independent of thromboplastin sensitivity. The advantage of the INR is uniformity of the PT assay from laboratory to laboratory.

Highly sensitive thromboplastins are indicated by an ISI of approximately 1.0. The more responsive the thromboplastin reagent, the lower the ISI value. The new thromboplastin reagent at UCHC is based on recombinant human tissue factor and has a reported ISI of 0.99. This new thromboplastin reagent at UCHC is much more sensitive than the previous reagent used.

Please note the PT times for patients on anticoagulant therapy and with factor deficiency(ies) will be significantly longer due to the increased sensitivity of the new reagent, for a given INR value. With progressive increases in INR, the degree of rise of the corresponding PT will be
much higher compared to the previous old reagent. However, the INR values from the old instrument/reagent versus the new instrument/reagent are essentially unchanged.

The new thromboplastin reagent used at UCHC will result in greater responsiveness to small changes in coagulation factor levels. There will be greater precision of INR and more precise control of dosages. The new thromboplastin reagent is also less sensitive to therapeutic heparin levels (up to 1.0 U/mL), therefore more accurately reflecting warfarin when transitioning from heparin to warfarin. There will also be less lot-to-lot variation over time and overall minimizes errors due to variation in instrument/reagent.

QUESTIONS? Please contact:
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REFERENCES: