TEST UPDATE

Protein C Activity and Protein S Activity Updates

UVMMC

Effective 7/29/24, a new comment will be added to our Protein C Activity and Protein S Activity assays, which will address the potential interference from the presence of a strong lupus anticoagulant. The Thrombosis and Hemostasis Laboratory at UVMMC performs Protein C Activity and Protein S Activity (Functional/ Clot based) testing and in the final report, important information for interpretation is provided in the comment section. We recently became aware that some reports may have had the comments for Protein C Activity and Protein S Activity (functional) assays inadvertently deleted. Therefore, the information to aid in the interpretation of results was not provided. This unintentional deletion of some laboratory comments was first detected in May 2024, and we believe this system error began in July 2023.

It is important to recognize that in a patient sample containing a direct oral anticoagulant (DOAC), the Protein C Activity and/or Protein S Activity has the potential to be overestimated (i.e. it could result in a falsely normal activity). Additionally, patients with certain co-morbidity conditions (e.g. lupus anticoagulant) prolonging the prothrombin time (PT) or partial thromboplastin time (PTT), may result in an **overestimated** Protein C Activity; a lupus anticoagulant is less likely to overestimate the Protein S Activity. As a result, a comment will be added to these assays that Protein C Activity and Protein S Activity may be overestimated in the presence of a lupus anticoagulant.

The following is a list of result comments added to these reports with the newly added comment in bold type:

Protein C Activity (Epic Code LAB290)

- **Results may be overestimated in the presence of a lupus anticoagulant; consider alternate Protein C testing (e.g., chromogenic PC activity assay to Mayo Clinic Laboratories).**
- Acquired Protein C deficiencies are associated with vitamin K antagonists, acute thrombotic events, vitamin K deficiency, liver disease and DIC.
- Results may be affected by plasma heparin levels greater than 1.5 U/mL for UFH and 0.8 for LMWH.
- Results may be overestimated in the presence of direct Xa inhibitors (rivaroxaban, apixaban, edoxaban) and direct thrombin inhibitors (dabigatran, argatroban, bivalirudin).
- Acute illness and/or thrombosis may influence test results in an unpredictable manner; therefore, results should be interpreted with caution in this setting.

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Protein S Activity (Epic Code LAB844)

- **Results may be overestimated in the presence of a lupus anticoagulant; consider alternate Protein S testing (e.g., Free Protein S assay to Mayo Clinic Laboratories).**
- Acquired Protein S deficiencies are associated with vitamin K antagonists, acute thrombotic events, vitamin K deficiency, L-asparaginase treatment and inflammatory syndrome. Deficiencies may or may not be present in liver disease and DIC.
- Results may be affected by plasma heparin levels greater than 1.6 U/mL for UFH and 1.8 for LMWH.
- Results may be overestimated in the presence of direct Xa inhibitors (rivaroxaban, apixaban, edoxaban) and direct thrombin inhibitors (dabigatran, argatroban, bivalirudin).
- Acute illness and/or thrombosis may influence test results in an unpredictable manner; therefore, results should be interpreted with caution in this setting.
- Age and hormonal status may affect the normal range for females.

For more information or questions regarding these changes, please contact the UVMMC Thrombosis and Hemostasis Laboratory at (802) 847-2950 and ask for either Kristin Lundy, MHA, CLS or Dr. Andrew Goodwin, Medical Director of Coagulation.

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