

## Measurement of new oral anticoagulants

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New oral anticoagulants (NOAC) like direct thrombin inhibitors or direct factor Xa inhibitors represent a new class of promising anticoagulation agents. In clinical routine monitoring of these new anticoagulants is not necessary but influences on routine coagulation assays are often observed as “side effect”. The direct factor Xa inhibitor rivaroxaban can induce an increase of the prothrombin time while the aPTT is influenced less. The direct thrombin inhibitor dabigatran induces time dependent prolongations of the aPTT, while the PT is influenced to a smaller extend. Since influences on both assay systems differ extensively depending on the reagents used these assays can not be used for accurate measurement of NOAC. In addition the coagulation parameters change over time depending on the short half life-time of these new medications. Therefore it is necessary for both the laboratory and the treating physician to know at which time the tablets were taken in relation to the blood samples taken.

Under special clinical circumstances accurate measurement of these drugs might be necessary ie in acute renal failure, in life-threatening bleeding, when thrombosis occurs despite anticoagulation etc.

In these situations chromogenic AntiXa-assays using rivaroxaban calibrators and controls can be used to determine the rivaroxaban-concentration while a diluted thrombin time assay, the hemoclot assay®, is available for accurate measurement of dabigatran. In contrast to rivaroxaban a linear correlation between bleeding tendency and increasing concentrations of dabigatran has been observed. Therefore trough levels of dabigatran have been defined by the manufacturer which may be associated with an increased bleeding risk.

For rivaroxaban no such information is available at the moment.

In conclusion new anticoagulants can alter coagulation assay results. These influences should be considered when hemostatic variables are analyzed in patients treated with these new anticoagulants. Blood samples should be taken directly before tablet intake to reduce these influences. When accurate measurement of dabigatran or rivaroxaban is necessary specific coagulation assays or chromogenic assays are already commercially available which provide NOAC calibrators and controls.