

## Direct anticoagulants



### **Description:**

Direct anticoagulants block the coagulation cascade through direct effects on certain coagulation factors, in contrast to indirect anticoagulants, which inhibit coagulation via antithrombin or vitamin K metabolism.

Direct anticoagulants are divided into the following categories:

Parenteral thrombin inhibitors: Argatroban (Agratra®); Bivalirudin (Angiox®)

Oral thrombin inhibitors: Dabigatran (Pradaxa®)

Oral factor Xa inhibitors: Rivaroxaban (Xarelto®); Edoxaban (Eliquis®); Apixaban (Lixiana®)

### **Reversal of DOACs:**

In the case of life-threatening bleeding or acutely necessary surgical procedures, the effect of dabigatran can be immediately reversed by administering idarucizumab (Praxbind®). Argatroban and bivalirudin cannot be antagonized but have a very short half-life. An antidote for factor Xa inhibitors is andexanet alpha (Ondexxya®).

High doses of prothrombin complex concentrates can also be used to reverse DOACs.

### **Surveillance:**

Because of the short half-life of direct thrombin inhibitors, the effect on coagulation values depends on the time of the last administration or the end of an infusion. Shortly after ingestion (approx. 4 hours later) the effects are most pronounced, and a few hours later they become significantly less pronounced.

Direct thrombin inhibitors can affect both PT and APTT in unpredictable ways. The thrombin clotting time is very prolonged, and an exact level determination can be carried out using special analyzes (hemoclot test = diluted thrombin time).

Direct factor Xa inhibitors can affect PT and APTT in unpredictable ways. The anti-Xa test is highly elevated (>2 U/mL). The respective drug levels can be determined precisely using appropriate dilutions and calibration curves.

In case of questions please contact a coagulation specialist.

### **References:**

Thomas L, Laboratory and Diagnosis, 2023, Release 5: <https://www.labor-und-diagnose.de/index.html>

Parameter catalog of the Clinical Institute for Laboratory Medicine, Med.Univ.Wien and AKH Vienna: <https://www.akhwien.at/default.aspx?pid=3982>

List of services for clinical chemistry, Univ.Klinikum Ulm: <https://www.uniklinik-ulm.de/zentrale-einrichtung-klinische-chemie/leistungskatalog.html>