

The first and most popular anticoagulant and antithrombotic medication, heparin is still utilized for a wide range of clinical purposes. Oral anticoagulant medication is typically administered after in-hospital heparin administration when long-term anticoagulant therapy is necessary. It also highlights the heparin's potential mechanism of action in related clinical settings, offers evidence in support of the heparin's clinical use, and raises important questions about the need to investigate the drug's broader application fields. Because heparin acts instantly when injected intravenously, it is the preferred anticoagulant when a quick anticoagulant effect is needed. When anticoagulant therapy is necessary during pregnancy and in the rare case of a patient developing recurrent venous thromboembolism while receiving the recommended dosages of oral anticoagulants, long-term out-of-hospital heparin treatment is employed. This article provides a thorough overview of the state of the art research on heparin compounds, including its structure, preparation, adverse reactions, pharmacological activity, and clinical applications. Heparin contains anticancer, anti-inflammatory, antiviral, and other pharmacological activity in addition to its anticoagulant and antithrombotic properties. For primary prevention, heparin is given at low dosages; for therapeutic purposes, heparin is given at high levels to prevent recurrent thrombosis. As the first anticoagulant medication in COVID-19, it is widely used clinically to treat lung, kidney, cancer, cardiovascular, and cerebrovascular illnesses, among other conditions. Heparin has not been replaced by other medications since it was found in 1916, despite nearly a century of continuous research; yet, significant advancements have been made in both basic and clinical heparin research. Heparin's anticoagulant impact must be watched for and the dosage must be changed periodically when it is administered in therapeutic quantities. It is recommended to employ a four-day overlap interval when both anticoagulants are administered together. It also has anticoagulant, anti-inflammatory, and antiviral properties. However, it also causes a number of negative side effects, including increased transaminase, thrombocytopenia, allergic responses, and bleeding... Because it needs to be delivered parenterally, its use is nearly usually restricted to an in-hospital situation.