

# Management of Patients on Oral Anti-Coagulant Therapy Undergoing Dental Surgical Procedures

**Pavithra Sekhar**

*Student,*

*Saveetha Dental College, Chennai*

**\*Dr. M.P.Santhosh Kumar** <sup>MDS</sup>

*Reader, Oral and Maxillofacial Surgeon*

*Saveetha Dental College, Saveetha University, Chennai*

**Abstract**

Dental treatment performed in patients receiving oral anticoagulant drug therapy is becoming increasingly common in dental offices. The aim of oral anticoagulant therapy is to reduce blood coagulability to an optimal therapeutic range within which the patient is provided some degree of protection from thromboembolic events. This is achieved at the cost of a minor risk of haemorrhage. The aim of this review is to evaluate the impact of anti-coagulant medication on dental treatment and highlight certain patient management issues.

**Keywords**

Oral anticoagulants, bleeding risk, dental procedures

**INTRODUCTION**

Oral anticoagulant therapy is prescribed for both prophylactic and therapeutic purposes. Oral Anticoagulants reduce blood clotting which can help prevent deep vein thrombosis, pulmonary embolism, myocardial infarction and ischemic stroke.

Therapeutic uses of anticoagulants include atrial fibrillation, pulmonary embolism, deep vein thrombosis, venous thromboembolism, congestive heart failure, stroke, myocardial infarction, and genetic or acquired hypercoagulability.

They are also used for thrombo prophylaxis for the prevention of postoperative venous thromboembolism after orthopaedic surgical procedures such as hip fracture and

prosthetic total hip or knee joint replacement, thromboembolic complications associated with atrial fibrillation and/or prosthetic replacement of cardiac valves. [1, 2]

When these patients have to undergo dental surgical procedures several protocols have been proposed and can be summarized as follows:

Temporary discontinuation or a reduction in dose of oral anticoagulants to obtain a sub therapeutic international normalised ratio (INR); replacement of oral anticoagulation with heparin or low-molecular weight heparins or no change in the therapy. [3]

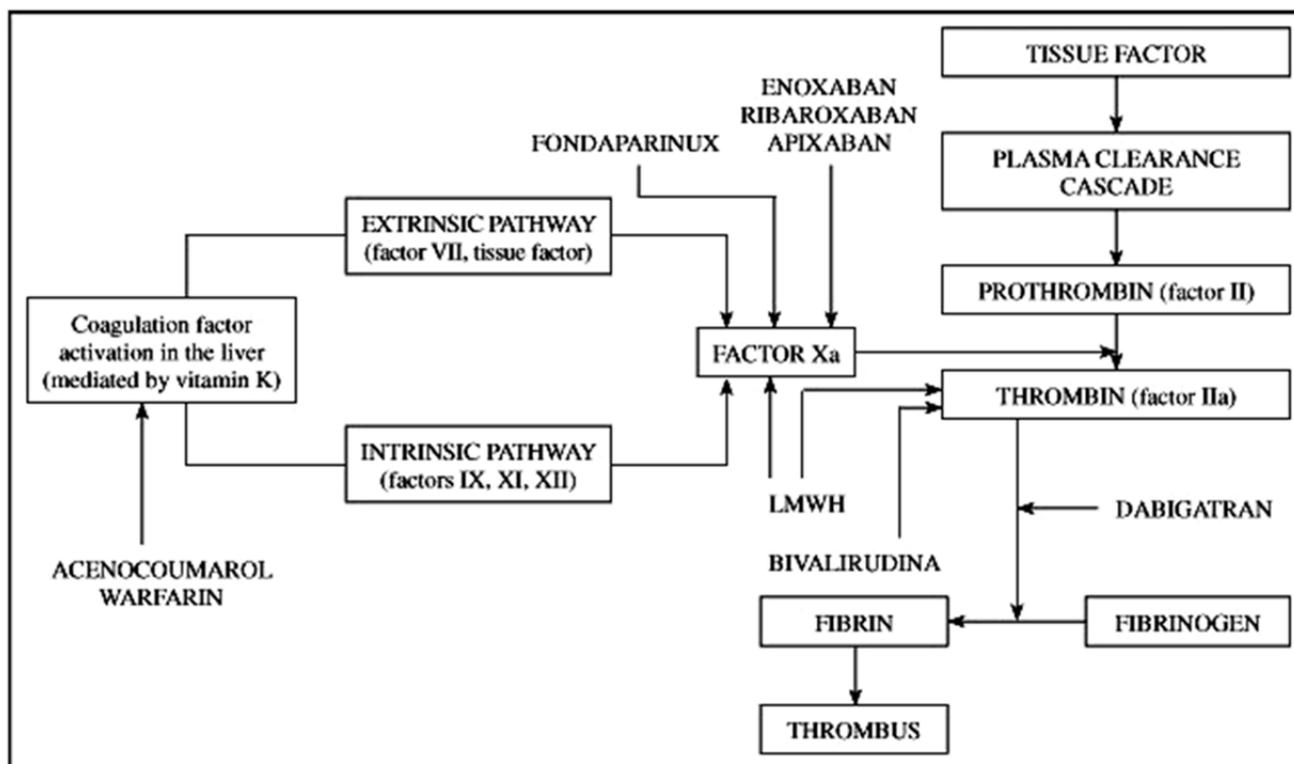


Figure : The Mechanism of action of Anticoagulants

### Oral anticoagulant medications:

The most frequently used medications for oral anticoagulant therapy are:

Anticoagulants with indirect action (coumarin derivatives)

- a. Acenocoumarol- derivative of coumarin and vitamin K antagonist.
- b. Warfarin sodium- it is also a derivative of coumarin.
- c. Phenindione

The novel oral anticoagulants [NOACs] or directly acting oral anticoagulants [DOACs] are:

#### Direct thrombin inhibitors

- a. Dabigatran- is a selective, reversible direct inhibitor.
- b. Argatroban

#### Direct factor Xa inhibitors

- a. Apixaban- is a potent, reversible, highly selective direct inhibitor.
- b. Rivaroxaban
- c. Edoxaban

### Tests for anti-coagulation assessment:

The prothrombin time ratio (PTR), defined as the patient's prothrombin time (PT) was used to monitor anticoagulant therapy for many years. Because of the variability of Prothrombin Time (PT) values from different reagents, a system of standardizing the reporting of anticoagulation activity has been developed by the World Health Organization. [4, 5, 6]

$INR = [PT \text{ test} / PT \text{ normal}]$

INR – INTERNATIONAL NORMALIZED RATIO

It is now widely used for monitoring anticoagulant therapy and dosage planning. The INR for a healthy patient is 1 and the therapeutic INR for those on anticoagulant therapy typically ranges from 2 to 4, depending on the reason for anticoagulation. [7, 8, 9, 10]

### Risk of thrombosis on stopping anticoagulation therapy:

In the past decade, it has become clear that routine discontinuation of oral anticoagulant therapy for dental procedures is not supported by the scientific literature, as it may put patients at unnecessary medical risk for thromboembolic events either from the cessation of anticoagulant therapy or because of "rebound phenomenon."

Currently, most guidelines indicate that patients with an INR less than 3.5 can undergo minor oral surgery (e.g., simple single extraction) without any adjustment in anticoagulation. Withdrawal or temporary interruption of anticoagulant medication, could lead to thromboembolic events. [4, 8, 10, 11]

### Risk of bleeding complications with continuing anticoagulant therapy:

The authors concluded that the risk of thromboembolism outweighed the risk of postoperative bleeding and patients whose INR is up to 4.0 do not have clinically significant bleeding post-operatively. [12, 13]

The risks of bleeding that occurs in patients on continued anticoagulant therapy after dental surgical procedures, can be easily controlled by local haemostatic measures.

### Local measures that can be used to control bleeding are:

Local haemostasis: can be achieved by local pressure (biting on gauze), wound site packing with gelatin sponges, absorbable oxycellulose, topical thrombin powder or solution, suturing the surgical wound.

Fibrin sealants: induce clot formation at the site of the surgical wound.

5% tranexamic acid mouthwashes used 4 times a day for 2 days (10ml in mouth for 2min) is effective in patients on anticoagulant therapy.

### Interactions with drugs frequently used or prescribed in dentistry:

Macrolide antibiotics (i.e., erythromycin, clarithromycin, and possibly azithromycin) and sulphonamides have been implicated in causing significant episodes of bleeding in patients taking warfarin or acenocoumarol. [14, 15]

The concomitant use of systemic azole antimycotics (ketoconazole, itraconazole, voriconazole, and posaconazole) as well as HIV protease inhibitors is not recommended in patients being treated with rivaroxaban.

Although platelet aggregation was reported to be unaffected, concomitant use of some NSAIDs and rivaroxaban significantly increased bleeding time compared with rivaroxaban alone. [1, 6]

These drug interactions must be kept in mind when prescribing for dental patients on oral anticoagulants to prevent bleeding episodes.

### CONCLUSION

INR values should be obtained within 24 hours before the dental procedure. For patients with INR in the therapeutic range 2-4 or below, therapy need not be modified or discontinued for simple single dental extractions. More complicated and invasive oral surgical procedures for patients with an INR on the high end of the scale or greater than 3.5 should be referred to physician for dose adjustment or therapy alteration before invasive dental procedures. [5, 8, 16]

The risk of thromboembolism on stopping oral anticoagulants outweighs the risk of postoperative bleeding on continuing oral anticoagulants.

The risk of bleeding may be minimized by use of oxidised cellulose or collagen sponges, fibrin sealants and Tranexamic acid mouthwashes used four times a day for 2 days. The use of concomitant medications, including antibiotics, antifungals, nonsteroidal anti-inflammatory drugs (NSAIDs), and other platelet aggregation inhibitors may affect a patient's ability to achieve adequate haemostasis after a routine dental procedure.

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