



## Review Article

## Dentistry and thromboembolic risk: Strategies for effective patient care

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## ABSTRACT

Thromboembolic events represent a significant healthcare concern, encompassing conditions such as deep vein thrombosis, pulmonary embolism, stroke, and myocardial infarction. The management of patients with a history of thromboembolic events in the dental setting requires careful consideration and collaboration between dentists and healthcare providers. This review article delves into the intricate relationship between thromboembolic events and dentistry.

We explore the importance of patient assessment, emphasizing the need for a comprehensive evaluation of medical history, risk factors, and medication regimens. Special attention is given to anticoagulant therapy, and the role of International Normalized Ratio (INR) monitoring in maintaining safe levels of anticoagulation during dental procedures. We discuss the critical timing of dental interventions and the use of local hemostatic measures to minimize bleeding risk. By elucidating these key aspects, this review article aims to provide dental professionals with a comprehensive understanding of thromboembolic events in dentistry, fostering safe and effective oral healthcare for this patient population.

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## 1. Introduction

Thromboembolic events refer to conditions where blood clots (thrombi) form within blood vessels and then break free to travel in the bloodstream (embolize) to other parts of the body. These events can have serious health consequences, including strokes, heart attacks, pulmonary embolisms, and deep vein thrombosis, among others.<sup>1</sup> It's essential for healthcare professionals, including dentists, to be aware of the risk factors and management of

thromboembolic events when providing care to patients. Here's how thromboembolic events relate to dentistry:

**Risk Factors:** Dentists should be aware of patients who have risk factors for thromboembolic events. These risk factors include:

1. A history of blood clots or thromboembolic events.
2. A family history of clotting disorders.
3. Certain medical conditions such as atrial fibrillation, deep vein thrombosis, or heart disease.
4. Medications that can increase the risk of clot formation, such as oral contraceptives or hormone

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replacement therapy.

**Medication Management:** Some patients may be taking anticoagulant medications (blood thinners) or antiplatelet drugs to prevent blood clots.<sup>2</sup> Dentists should be familiar with these medications and work closely with patients and their healthcare providers to manage them effectively. In some cases, temporary discontinuation of anticoagulants may be necessary before certain dental procedures to minimize bleeding risk. However, this should only be done under the guidance of a physician, and alternative measures may be taken, such as local hemostatic agents.<sup>3</sup>

**Dental Procedures:** Dentists must consider the risk of bleeding during dental procedures, especially oral surgery and extractions, for patients on anticoagulant therapy. They should take precautions to minimize bleeding, such as using local hemostatic agents, sutures, and providing postoperative instructions to patients.

**Infection Control:** Dentists should also pay attention to infection control practices to prevent infections, which could potentially trigger thromboembolic events in susceptible patients.<sup>4</sup>

**Patient Education:** Dentists play a role in educating patients about their risk factors for thromboembolic events and the importance of adhering to their prescribed medications and maintaining good oral hygiene to minimize the risk of dental infections.

**Collaboration with Healthcare Providers:** Dentists may need to collaborate with a patient's primary care physician or other specialists to ensure comprehensive care for individuals at higher risk of thromboembolic events. This can include obtaining medical clearance and recommendations for dental treatment.<sup>5</sup>

## 2. Management of Patient on Anticoagulant in Dentistry

Managing patients on anticoagulant therapy in dentistry requires careful consideration to prevent excessive bleeding during dental procedures while minimizing the risk of thromboembolic events associated with discontinuing anticoagulation. Here are some key points to keep in mind when managing such patients:

### 2.1. Assessment of patient's medical history

Before any dental procedure, it's essential to review the patient's medical history, including their current medications and the specific anticoagulant being used. Identify any potential bleeding risks or contraindications for dental treatment.<sup>6</sup>

### 2.2. Consultation with the patient's healthcare provider

If the patient is taking anticoagulants, consult with their prescribing physician or cardiologist to understand the

patient's overall medical condition and to determine the level of anticoagulation control. This will help in deciding whether temporary modification of anticoagulant therapy is necessary.

### 2.3. INR monitoring

For patients taking warfarin (Coumadin) or other vitamin K antagonists, check the International Normalized Ratio (INR) to assess the degree of anticoagulation. Ideally, the INR should be within the therapeutic range (usually 2.0 to 3.0) before performing any elective dental procedures. Adjustments may be required in consultation with the physician.<sup>7</sup>

### 2.4. Timing of dental procedures

Whenever possible, schedule elective dental procedures when the patient's INR is within the therapeutic range. This can reduce the risk of excessive bleeding. Minor procedures like routine cleanings may not require any changes to anticoagulant therapy.<sup>8</sup>

### 2.5. Local hemostatic measures

During dental procedures, employ local hemostatic measures to control bleeding effectively. This includes the use of hemostatic agents, sutures, and pressure to control any bleeding sites.<sup>9</sup>

### 2.6. Avoid invasive procedures

If possible, opt for less invasive treatment options. For example, use nonsurgical methods for periodontal treatment, and avoid extractions or other invasive oral surgeries unless they are deemed essential for the patient's oral health.<sup>10</sup>

### 2.7. Antifibrinolytic agents

Consider using antifibrinolytic agents, such as tranexamic acid mouthwash, to help control bleeding during and after dental procedures. However, consult with the patient's healthcare provider before using such medications.<sup>11,12</sup>

### 2.8. Postoperative instructions

Provide clear postoperative instructions to patients on anticoagulants, including information on how to manage any bleeding or swelling and when to seek immediate medical attention if complications arise.

### 2.9. Follow-Up

Schedule follow-up appointments to monitor the patient's healing progress and address any postoperative concerns or complications.<sup>13</sup>

### 2.10. Emergency protocols

Have an emergency protocol in place to manage any severe bleeding that may occur during or after dental procedures, including contacting the patient's healthcare provider or emergency services if necessary.<sup>14</sup>

Remember that the management of patients on anticoagulant therapy in dentistry should be individualized and based on the patient's specific medical condition, the type of anticoagulant being used, and the planned dental procedure. Collaboration between the dentist and the patient's healthcare provider is essential to ensure the patient's safety and optimal oral health.<sup>15</sup>

### 3. International Normalized Ratio (INR) values

The International Normalized Ratio (INR) is a standardized measurement used to monitor and assess the effectiveness of anticoagulant medications, primarily warfarin (Coumadin), in regulating the blood's clotting ability. INR values are used to ensure that a patient's blood remains within a target therapeutic range, which helps prevent both excessive bleeding and the formation of dangerous blood clots.<sup>16</sup> Here are some typical INR values and their interpretations:

#### 1. INR Less Than 2.0

- (a) An INR value below 2.0 indicates that the blood is clotting more easily than desired.
- (b) This range may be appropriate for certain conditions where a lower risk of bleeding is acceptable, such as some patients with atrial fibrillation.<sup>17</sup>

#### 2. INR Within the Therapeutic Range (2.0 to 3.0)

- (a) For most indications, including the prevention and treatment of venous thromboembolism and atrial fibrillation, the target INR range is between 2.0 and 3.0.
- (b) When the INR falls within this range, it suggests that the anticoagulant therapy is effective at preventing excessive clotting without significantly increasing the risk of bleeding.

#### 3. INR Greater Than 3.0

- (a) An INR value above 3.0 indicates that the blood is thinning more than desired.
- (b) Higher INR values may be targeted for certain conditions, such as patients with mechanical heart valve replacements, where a higher risk of clot formation is present.

#### 4. INR Values Above the Target Range

- (a) INR values significantly above the target range (e.g., INR > 4.0) may increase the risk of bleeding complications.

- (b) In such cases, healthcare providers may adjust the anticoagulant dose downward or temporarily discontinue the medication, depending on the clinical context.

#### 5. INR Values Below the Target Range

- (a) INR values significantly below the target range may suggest inadequate anticoagulation and an increased risk of clot formation.
- (b) Healthcare providers may adjust the anticoagulant dose upward in such cases.<sup>18</sup>

It's important to note that the specific target INR range may vary depending on the patient's underlying medical condition, the type of anticoagulant used (e.g., warfarin, direct oral anticoagulants), and individual patient factors. Therefore, the target INR range and interpretation should always be determined by the patient's healthcare provider based on their clinical situation.<sup>19</sup>

### 4. Emergency Protocols in Managing Potential bleeding Complications During Dental Procedures

Managing potential bleeding complications during dental procedures requires a well-defined emergency protocol to ensure the safety and well-being of the patient. Here's an outline of key components that should be included in such a protocol

1. Immediate Assessment: The dental team should recognize and assess the severity of the bleeding promptly. Determine the source of bleeding, whether it's from a surgical site or another location in the oral cavity.
2. Patient Stabilization: Ensure the patient's airway remains clear and that they can breathe adequately. Maintain the patient's vital signs, including heart rate and blood pressure. Position the patient in a way that minimizes the risk of aspiration or choking.<sup>20</sup>
3. Direct Pressure: Apply direct pressure to the bleeding site using sterile gauze or a hemostatic agent. Maintain consistent pressure to control bleeding. If the bleeding is from a surgical site, reposition surgical instruments or sutures as needed.
4. Local Hemostatic Agents: Consider the use of local hemostatic agents, such as oxidized cellulose or tranexamic acid-soaked gauze, if direct pressure alone is not effective.
5. Suturing: If the bleeding source is a surgical site, evaluate the need for additional sutures or re-suturing to control bleeding. Ensure that the suture material used is appropriate for achieving hemostasis.
6. Hemostatic Dressings: In cases of persistent or severe bleeding, consider the use of absorbable hemostatic dressings. These dressings can be applied directly

to the bleeding site and may aid in achieving hemostasis.<sup>21</sup>

7. Communication: Inform the patient about the situation, the measures being taken, and reassure them. If necessary, contact the patient's emergency contact or primary healthcare provider for guidance or additional information regarding the patient's medical history or medications.
8. Activation of Emergency Medical Services (EMS): If bleeding cannot be controlled promptly or if the patient's condition deteriorates, activate EMS. Provide EMS personnel with all relevant patient information and vital signs.<sup>22</sup>
9. Documentation: Accurate and thorough documentation of the incident, including the date, time, measures taken, and patient responses, is crucial for future reference and potential follow-up care.
10. Follow-Up Care: - After the bleeding is controlled, provide appropriate follow-up care and instructions to the patient. - Monitor the patient's recovery and response to treatment.
11. Review and Improvement: - Conduct a post-incident review with the dental team to identify any areas for improvement in emergency response and patient care.

Emergency protocols should be well-documented and regularly reviewed by the dental team to ensure readiness and effectiveness in managing potential bleeding complications during dental procedures. Additionally, ongoing training and preparedness drills can help dental professionals respond effectively in emergency situations.<sup>23,24</sup>

## 5. Conclusion

The management of patients with a history of thromboembolic events in the context of dentistry is a delicate balance between providing necessary oral care and minimizing the risk of bleeding complications. Dentists and healthcare providers should work collaboratively to ensure the safety and well-being of these patients.

Overall, the management of thromboembolic events in dentistry requires a multidisciplinary approach, with a focus on individualized care that prioritizes both oral health and the patient's overall well-being. By carefully considering the patient's medical history, medication management, and the type of dental procedures performed, dentists can provide safe and effective care to these patients while minimizing the risk of bleeding complications.

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The authors have no competing interests to declare that are relevant to the content of this article.

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