

# The mythology of anticoagulation therapy interruption for dental surgery



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## ABSTRACT

**Background.** Continuous anticoagulation therapy is used to prevent heart attacks, strokes, and other embolic complications. When patients receiving anticoagulation therapy undergo dental surgery, a decision must be made about whether to continue anticoagulation therapy and risk bleeding complications or briefly interrupt anticoagulation therapy and increase the risk of developing embolic complications. Results from decades of studies of thousands of dental patients receiving anticoagulation therapy reveal that bleeding complications requiring more than local measures for hemostasis have been rare and never fatal. However, embolic complications (some of which were fatal and others possibly permanently debilitating) sometimes have occurred in patients whose anticoagulation therapy was interrupted for dental procedures.

**Practical Implications and Conclusions.** Although there is now virtually universal consensus among national medical and dental groups and other experts that anticoagulation therapy should not be interrupted for most dental surgery, there are still some arguments made supporting anticoagulation therapy interruption. An analysis of these arguments shows them to be based on a collection of myths and half-truths rather than on logical scientific conclusions. The time has come to stop anticoagulation therapy interruption for dental procedures.

**Key Words.** Anticoagulation; embolism; hemorrhage; hemostasis; ischemic stroke; thrombosis; pharmacology.

JADA 2018;149(1):e1-e10

<https://doi.org/10.1016/j.adaj.2017.09.054>

Continuous anticoagulation therapy has been used for decades to prevent stroke, heart attack, and other embolic complications in patients with deep vein thrombosis, pulmonary embolism, history of stroke, atrial fibrillation, and mechanical heart valves. When patients receiving anticoagulation therapy undergo dental surgery (defined as any oral procedure involving an incision or other break in the gingiva or mucosa, which can include anything from single simple dental extractions to implant surgery to multiple surgical extractions and alveoloplasties), a decision must be made either to continue anticoagulation therapy and risk bleeding complications or interrupt anticoagulation therapy and risk embolic complications. Although it has been controversial, after more than 60 years of studies, there is now near universal consensus that anticoagulation therapy including either warfarin (Coumadin, Bristol-Myers Squibb) or direct oral anticoagulation therapy with dabigatran (Pradaxa, Boehringer Ingelheim Pharmaceuticals), apixaban (Eliquis, Bristol-Myers Squibb), rivaroxaban (Xarelto, Janssen Pharmaceutica), or edoxaban (Savaysa, Daiichi Sankyo Company) should not be interrupted for most dental surgical patients because the increased risk of developing bleeding complications (which are usually simple to treat and have not been shown to be fatal) with continuation is outweighed by the increased risk of developing embolic complications (which often are permanently debilitating and sometimes fatal) with interruption.<sup>1-4</sup> Some investigators have called continuing anticoagulation therapy for dental extractions the “gold standard in the perioperative management of anticoagulation.”<sup>5</sup>

## NATIONAL MEDICAL AND DENTAL GROUP STATEMENTS

In 7 different statements, no fewer than 9 national medical and dental groups that have addressed the issue independently now recommend continuing anticoagulation therapy for most dental patients, although 1 group has added an option for interruption. The American Heart Association and

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**Table.** National medical and dental group recommendations on anticoagulation therapy for dental surgery.\*

GROUP, Y	MEDICATION	CONTINUE OR INTERRUPT ANTICOAGULATION THERAPY?
American Heart Association, American College of Cardiology, <sup>6</sup> 2003	Warfarin	Continue, use antifibrinolytic mouthrinse
Haemostasis and Thrombosis Task Force of the British Committee for Standards in Haematology, <sup>7</sup> 2007	Warfarin	Continue, check international normalized ratio levels within 72 hours before dental surgery
American College of Chest Physicians, <sup>15</sup> 2012	Vitamin K antagonists (warfarin)	Continue, use oral prohemostatic agent; or interrupt for 2 to 3 days before dental surgery
American Academy of Neurology, <sup>8</sup> 2013	Warfarin	Continue
Society for Neuroscience in Anesthesiology and Critical Care, American Society of Anesthesiologists, <sup>9</sup> 2014	Warfarin	Continue, for single dental extractions
American Dental Association, <sup>10</sup> 2015	Vitamin K antagonists (warfarin) and direct oral anticoagulants	Continue, for most patients
American Academy of Oral Medicine, <sup>11</sup> 2016	Warfarin	Continue, use international normalized ratio testing within a few days before the procedure

\* Adjuvant local measures for hemostasis should be available, including gauze, sutures, absorbable gelatin foam, oxidized cellulose, microfibrillar collagen, or antifibrinolytic agents. Proper ambulation and diet are important to maintain before and after dental surgery with all patients, but especially with patients receiving vitamin K antagonists such as warfarin, which are associated with certain food interactions.

the American College of Cardiology issued a 2003 statement recommending continuing warfarin anticoagulation therapy with an antifibrinolytic mouthrinse for patients undergoing dental procedures.<sup>6</sup> The Haemostasis and Thrombosis Task Force of the British Committee for Standards in Haematology in 2007 recommended continuing warfarin anticoagulation therapy for patients undergoing dental surgery, with international normalized ratio (INR) levels checked within 72 hours before surgery.<sup>7</sup> The American Academy of Neurology issued a 2013 statement recommending continuing warfarin anticoagulation therapy for patients undergoing dental surgery.<sup>8</sup> In a statement supported by the American Society of Anesthesiologists, the Society for Neuroscience in Anesthesiology and Critical Care recommended in 2014 that patients continue anticoagulation therapy for single dental extractions.<sup>9</sup> In a statement issued in 2015, the American Dental Association recommended continuing warfarin or direct oral anticoagulation therapy for most patients undergoing dental surgery, stating that “it is not necessary to alter anticoagulation or antiplatelet therapy prior to dental intervention.”<sup>10</sup> The American Academy of Oral Medicine in 2016 recommended that warfarin anticoagulation therapy should be continued for patients undergoing dental procedures, stating, “In general, the risk to the patient from altering the warfarin dosage far exceeds the potential problem of bleeding following dental procedures of this nature.”<sup>11</sup>

The American College of Chest Physicians (ACCP) statements in 2001,<sup>12</sup> 2004,<sup>13</sup> and 2008<sup>14</sup> recommended continuing anticoagulation therapy for patients undergoing dental surgery. In the 2004 and 2008 statements, the ACCP recommended coadministration of an oral prohemostatic agent. In the 2012 statement (Table),<sup>15</sup> the ACCP recommended continuing warfarin anticoagulation therapy with the addition of an oral prohemostatic agent (“eg, antifibrinolytic drugs, sutures”<sup>15</sup>), but now added an option for a 2- or 3-day anticoagulation therapy interruption, such that INR levels would decrease to a range of 1.6 and 1.9 but not to 1.0 (no anticoagulation therapy at all).<sup>15,16</sup> Todd<sup>17</sup> has favored a similar approach, reducing the level to an INR of 1.5.

Despite overwhelming evidence supporting anticoagulation therapy continuation, these authors and a few others still advocate interrupting anticoagulation therapy for dental surgery. On analysis, however, the arguments favoring anticoagulation therapy interruption are not based on facts but are actually a collection of myths and half-truths.

## ABBREVIATION KEY

**ACCP:** American College of Chest Physicians.  
**INR:** International normalized ratio.

## MYTH 1: STUDY RESULTS SUPPORTING INTERRUPTION

In its 2012 statement,<sup>15</sup> the ACCP cited 4 prospective studies in which the investigators compared dental surgery in patients receiving anticoagulation therapy versus that in patients whose

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