



AUSTRALIAN DENTAL ASSOCIATION
WESTERN AUSTRALIA

A guide to the oral and dental management of patients taking DOACs

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This guide has been formulated to accompany the Oral and Dental Therapeutic Guidelines Version 3 (1), which were formulated by the Oral and Dental Expert Group. The use of the same terminology has been adopted to avoid confusion and to provide important supplementary information.

For more than half a century, Warfarin had been the most widely used oral anticoagulant in clinical practice, which made it a familiar drug with protocols available for both prolonged bleeding prevention and bleeding management. The success of Warfarin therapy revolved around strict control of the international normalised ratio (INR), which could sometimes be challenging. With the introduction of the Direct Oral Anticoagulants (DOACs), the need for regular laboratory monitoring while using the DOAC has been eliminated. Also, the DOACs have been shown to equal, if not be superior to, Warfarin in the management of conditions such as venous thromboembolism and atrial fibrillation related stroke. (2)

The increased use of DOACs means that the dentist should have a sound understanding of the mechanism of action, pharmacology and the management of bleeding in a patient on DOACs. DOACs are non-vitamin K antagonist oral anticoagulants and are approved for the management of non-valvular atrial fibrillation, thromboembolism, and acute coronary syndrome. It may also be prescribed following hip and knee replacement.

These drugs act as direct thrombin inhibitors (Dabigatran [Pradaxa]), or as direct factor Xa inhibitors (Rivaroxaban [Xarelto]; Apixaban [Eliquis]).

Apart from a patient's use of DOACs, bleeding is also influenced by a number of other patient-related factors. (See table 1).

TABLE 1: PATIENT-RELATED BLEEDING FACTORS

Liver impairment / disease	Chronic renal failure
Pre-existing bleeding disorders: Haemophilia, Von Willebrand's disease	Excess alcohol intake
Hypertension	Supplements: Fish oil
Medications: anticoagulants / antiplatelets, corticosteroids, cytotoxic drugs, NSAIDs	Haematological issues: Leukaemia, lymphoma myelodysplasia
Autoimmune disease: Immune thrombocytopenia	Infection (HIV)

SOCIAL HISTORY

The decision to perform an invasive procedure may also require an understanding of a patients' social situation. A patient may be at greater risk should post-operative bleeding occur if they live alone without the potential assistance from friends or family. Cognitive impairment is more frequent in the older population who are often the group prescribed DOACs and it is important that appropriate support is available for them. Furthermore, special consideration should be given to those rural patients in Western Australia who live in isolated or distant locations, where post-extraction recovery may occur in a location distant from supportive health care.

SEVERITY OF BLEEDING:

There are no clear and standardised definitions in the literature for minor, moderate or severe bleeding following invasive oral surgery procedures. Post-operative bleeding with regards to oral surgery includes: bleeding lasting more than 12 hours, where the patient had to call the practitioner/ the practice/emergency department; where a large haematoma/ecchymosis occurred; or the patient required a transfusion.

Unfortunately, the majority of studies assessing bleeding from dental procedures are of low-quality evidence and have included low numbers of participants. Additionally, they are often conducted in specialist practice where the skillset of the provider and available equipment may differ to that of general dental practice. The outcomes may therefore differ to that expected in the general practice. Dabigatran and Rivaroxaban have been available for longer and hence there are more studies reporting data on these agents. In the majority of studies where procedures were performed under local anaesthesia, post-operative bleeding was considered minor-moderate and manageable with local measures without the need for hospitalisations or blood transfusions. (3) It should be noted that the majority of studies do not record the severity of intra-operative bleeding.

The bleeding risk of oral surgery and dental procedures can be divided as follows:

1. Unlikely to cause prolonged bleeding
2. Likely to cause prolonged bleeding (lower risk and higher risk) (See table 2).

TABLE 2: BLEEDING RISK OF ORAL SURGERY AND DENTAL PROCEDURES

Unlikely to cause prolonged bleeding	<ul style="list-style-type: none"> • Examination and diagnostic procedures • Restorative treatment • Root-canal treatment • Orthodontic treatment
Likely to cause prolonged bleeding Lower risk	<ul style="list-style-type: none"> • Extraction of 1 to 3 teeth which are not adjacent to each other and not impacted • Subgingival periodontal debridement • Incision and drainage of swellings • Limited or small (less than 10mm) soft tissue biopsies
Likely to cause prolonged bleeding Higher risk	<ul style="list-style-type: none"> • Extraction of 4 or more teeth • Extraction of adjacent or impacted teeth • Procedures where a mucoperiosteal flap is used • Soft tissue biopsies: Extensive (Greater than 10mm); <ul style="list-style-type: none"> - Certain anatomical sites including the tongue, palate and floor of mouth • Hard tissue biopsies: <ul style="list-style-type: none"> - Dental implant treatment* - Autogenous grafting * - Sinus grafting *

* Dental-implant treatment is another area with limited data. The risk relates to the technique of the practitioner (ie flap design) and the need for grafting. Autogenous soft or hard tissue grafting not only raises the risk of bleeding at the implant site, but also the risk of bleeding at the potential donor site or higher anatomical risk areas, such as sinus grafting.

The categorisation of dental procedures likely to cause prolonged bleeding into low risk and high risk can also vary based on the skill of the practitioner performing these procedures. Hence, this should only be taken as a guide. If experience is lacking in the procedure, the risk of bleeding from the procedure may be upstaged. For higher-risk procedures, serious consideration should be given to referring to an oral and maxillofacial surgeon. In the event of haemorrhage, the oral and maxillofacial surgeon is the specialist who will likely be managing the case.

The majority of patients taking a DOAC are likely to be on other antithrombotic agents, and hence in procedures which are likely to cause prolonged bleeding, the following guide should be considered, **if there are no other patient-related bleeding factors** (Table 3):

TABLE 2: BLEEDING RISK OF ORAL SURGERY AND DENTAL PROCEDURES

Dual antiplatelet + DOAC *	This patient will likely require temporary interruption of the DOAC and consider referral to an oral and maxillofacial surgeon.
Antiplatelet + DOAC	This patient may require temporary interruption of the DOAC.
DOAC only	This patient may require temporary interruption of DOAC in procedures with a higher risk of prolonged bleeding.

* This is a very high-risk medical patient, and dual antiplatelet therapy should not be interrupted for 6 months following a cardiac event. They remain a high risk of haemorrhage with DOAC withheld and dual-antiplatelets maintained. Consideration of referral to an oral and maxillofacial surgeon is appropriate in this high risk medically compromised patient.



In these scenarios where temporary interruption of the DOAC may be required, consultation with the patient's cardiologist/medical practitioner is recommended and referral to an oral and maxillofacial surgeon may be considered. The objective of treatment is to minimise the risk of bleeding and minimise the period of anticoagulation interruption.

STOPPING THE DOAC AND RESTARTING THE DOAC

Consensus is lacking regarding interrupting a DOAC regime due to low quality of current evidence. A judgement needs to be made regarding the potential harm of continuing the drug, which may increase the risk of prolonged bleeding against the risk that stopping the drug can lead to a thromboembolic event. The majority of patients taking DOACs are for non-valvular atrial fibrillation which carries a lower risk of thromboembolism. (Non-valvular atrial fibrillation is atrial fibrillation in those without valvular heart disease, or prosthetic valve replacements).

Patient characteristics (including age, history of bleeding complications, concomitant medication, and kidney function), patient geography, as well as surgical-bleeding risk factors, need to be taken into account to determine when to stop and restart a DOAC. (4)

There are currently no validated prospective data of any coagulation test to guide the timing of surgical procedures. (6)

- The anticoagulant effect of DOACs wanes within 12-24 hours after the last intake
- The maximum effect of the DOAC will occur at its maximal plasma concentration, which is approximately 2-3 hours after intake for each of these drugs

In collaboration with the patient's cardiologist or prescribing medical practitioner, the following regime is often used:

1. Procedures can be performed 12-24 hours after the last DOAC intake if the patient has normal renal function, which is guided by the medical practitioner (5)
2. The patient may only leave the clinic if any peri-operative bleeding has completely stopped. See (table 4) for local bleeding control measures after the oral or dental procedures
3. Full dose of the DOAC can usually be resumed after 24 hours post-lower risk of prolonged bleeding intervention if haemostasis is maintained. This may need to be extended for higher risk of prolonged bleeding interventions (6)

TABLE 4: LOCAL BLEEDING CONTROL MEASURES AFTER THE ORAL OR DENTAL PROCEDURE:

Use of adrenalin containing local anaesthetic agents.
Application of pressure to the site(s) of the invasive procedure by way of surgical gauze.
<p>The use of local antifibrinolytics:</p> <ul style="list-style-type: none"> a. Topical tranexamic acid has proven efficacy to support haemostasis particularly in trauma-induced bleeding. <ul style="list-style-type: none"> i. Tranexamic acid mouthwash 4.8% or compressive gauze soaked in tranexamic acid. (This is not to be ingested).
The use of oxidised cellulose (Surgicel), absorbable gelatin sponge (Gelfoam, Spongostan) or bone wax in the extraction socket.
<p>Try to primarily close wounds, if possible, with sutures.</p> <p><i>(This does not necessarily mean raising a flap, which may exacerbate bleeding.)</i></p>

A specific reversal agent is available for Dabigatran: Idarucizumab, a humanised antibody fragment that specifically binds Dabigatran. This is not universally available and is expensive therapy which is administered in an emergency department.

References:

1. Oral and Dental Version 3 Therapeutic guidelines.
2. Garcia DA, Wallentin L, Lopes RD, et al. Apixaban versus warfarin in patients with atrial fibrillation according to prior warfarin use: Results from the Apixaban for Reduction in Stroke and Other Thromboembolic Events in Atrial Fibrillation trial. *Am Heart J.* 2013;166: 549-558.
3. Christoforou J, Karasneh J, Manfredi M, et al. WWOM VII: Direct anticoagulant agents management for invasive oral procedures: A systematic review and meta-analysis. *Oral Diseases.* 2019; 25(sup 1):182-192.
4. Auer J, Huber K, Granger CB. Interruption of non-vitamin K antagonist anticoagulants in patients undergoing planned invasive procedures: how long is long enough? *Eur Heart J.* 2017;38:2440-2443.
5. Thrombosis Canada 2013- Peri-operative management of patients who are receiving a New Oral Anticoagulant. <http://thrombosiscanada.ca/guides/pdfs/NOACs>
6. NOAC Guidelines 2017- Clinical Excellence Commission 2017. www.cec.health.nsw.gov.au



Figure 1: Flow chart of the decision-making process for DOAC regime alteration for a patient who is taking a DOAC and is undergoing a procedure that is likely to cause prolonged bleeding.

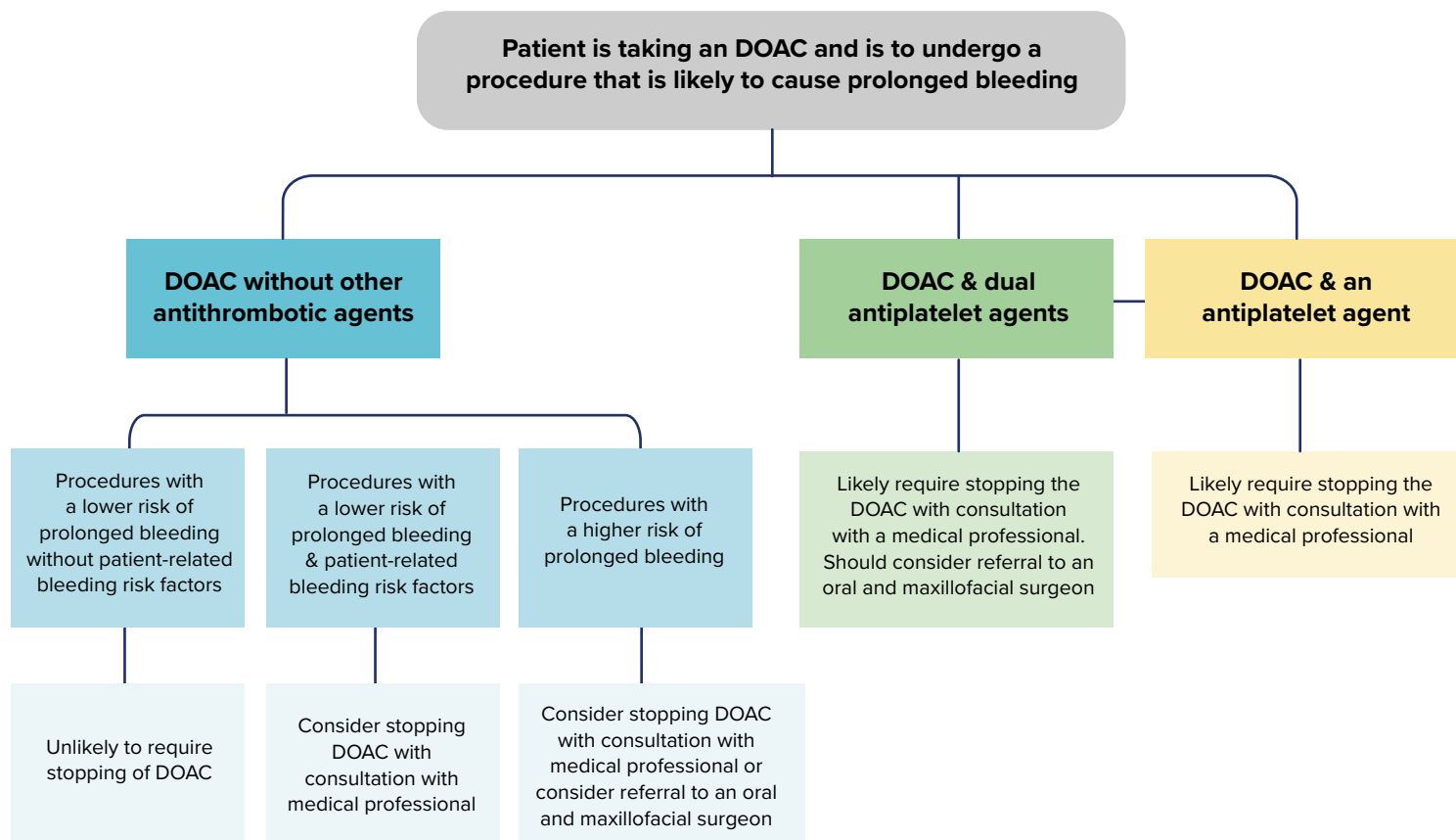
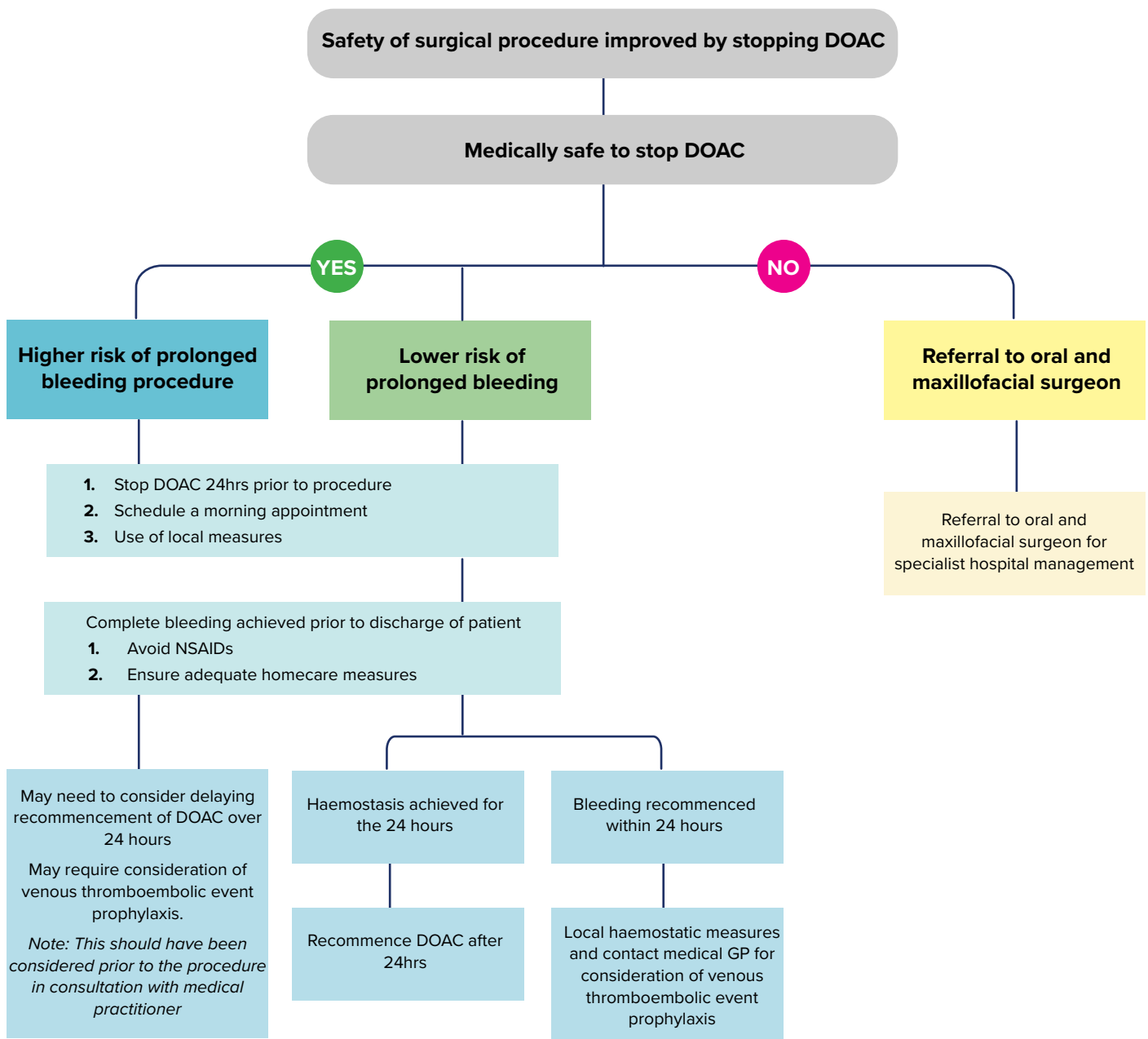


Figure 2: Flow chart of the management of a patient who is likely to require altering the DOAC regime to reduce the risk of prolonged bleeding.



Note: This is only a guide and will require self-judgement.



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There is a continuous influx of new medications entering the market and many of these will have dental implications. Of particular importance are the introduction of Direct Oral Anticoagulants (DOACS). These medications can pose significant bleeding risks and require an understanding of prolonged bleeding prevention and bleeding management.

This guide has been formulated to accompany the Oral and Dental Therapeutic Guidelines Version 3, with an aim to provide important supplementary information.

The information presented in this guide has been developed through a collaborative effort by the authors in their various disciplines. They do endeavour for this publication to be used as an additional helpful resource when approaching dental management of patients taking DOACS.



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