Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and require Dental Treatment

Dental Clinical Guidance

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As this is a consultation draft, any changes to practice should only be considered after the final version is published.

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1 Introduction

The treatment of patients taking anticoagulant or antiplatelet medication raises safety issues in terms of the potential risk of bleeding complications following invasive dental procedures. The anticoagulant warfarin, and antiplatelet agents aspirin and clopidogrel, have been widely used for many years and most dental practitioners will be familiar with established guidelines and local protocols for the dental care of patients taking these drugs. However, in recent years several newer oral anticoagulants (NOACs; Novel Oral Anticoagulant or Non-vitamin K antagonist Oral Anticoagulants) and antiplatelet drugs have become available in the UK and consequently there is uncertainty around the appropriate management of dental treatment for patients presenting on these medications.

This guidance aims to clarify the current recommendations and expert advice for the newer oral anticoagulants and antiplatelet drugs and presents these, along with up-to-date recommendations for the more established medications, within a single information resource.

1.1 Scope of the guidance

While there are a number of existing guidelines for the treatment of dental patients taking warfarin\(^1\text{-}^3\) or aspirin\(^3\text{-}^4\), consistent national dental clinical practice guidelines addressing the newer medications are lacking\(^5\). This guidance aims to encourage a consistent approach to the management of dental treatment for patients who are taking anticoagulants or antiplatelet drugs by providing evidence and expert opinion based recommendations and information, relevant to dental treatment, on the existing, new and emerging anticoagulant and antiplatelet treatments. Through the clinical practice advice provided, the guidance also aims to empower dental staff to treat this patient group within primary care and to inform decision making for consultation and referral to secondary care. The clinical management of dental patients who are taking anticoagulants or antiplatelet drugs and being treated within a medical hospital setting is beyond the scope of this guidance and is not discussed.

The guidance is primarily directed at dentists, hygienists and therapists in primary care dental practice, including the general dental service and public dental service, and will also be of relevance to the secondary care dental service, those involved in dental education and undergraduate trainees. The guidance contains specific patient information and advice for general medical practitioners, nurses and pharmacists dealing with patients taking anticoagulants or antiplatelets, relating to their dental care.

1.2 Basis for the guidance recommendations

To develop recommendations for this guidance, SDCEP convened a multidisciplinary guidance development group including medical and dental practitioners and specialists along with a patient representative (Appendix 1). The key recommendations presented in the guidance were developed through considered judgements, made by the group, based on the
existing guidelines, the available evidence, clinical experience, expert opinion and patient and practitioner perspectives. Details of these considered judgements are available on request.

This process for development of recommendations followed the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach (www.gradeworkinggroup.org). The strength of each key recommendation is stated in the accompanying text with a brief justification. Further details can be found in appendix 1 and are available on request.

Other clinical practice recommendations in this guidance are based on consensus, expert opinion and existing best practice as identified in the accompanying text.

1.3 Supporting tools

Tools to support the implementation of the guidance are provided and include:

- A summary of the guidance recommendations provided as a single page flow chart within the guidance (Appendix 8). When the guidance is published, this will also be available, via the SDCEP website, as a separate summary document.

- A Patient Information Leaflet including post-treatment advice (Appendix 5). When the guidance is published this will also be available, via the SDCEP website, as a printable A5 booklet that can be modified to contain relevant contact details.

- Information for prescribers and dispensers of anticoagulants and antiplatelet drugs (Appendix 6).

1.4 Statement of Intent

This guidance is based on careful consideration of the available information and resources at the time of issue and has been developed through consultation with experts and end-users (see Appendix 1). As guidance, it does not override the healthcare professional’s right, and duty, to make decisions appropriate to each patient, with their informed consent. However, it is advised that departures from this guidance, and the reasons for this, are fully documented in the patient’s clinical record.
2 Anticoagulants and antiplatelet drugs

2.1 What are anticoagulants and antiplatelet drugs?

Anticoagulants and antiplatelet drugs are agents that reduce the ability of blood to form clots, or coagulate. Blood clotting is a process triggered naturally in response to damage to blood vessels from injury or invasive procedures. Platelets within the blood become activated locally, resulting in an increased tendency to adhere to each other and to damaged blood vessel endothelium (primary haemostasis). At the same time a cascade of reactions is initiated converting inactive coagulation factors to their active forms, ultimately leading to the production of the protein fibrin, the activated cross-linking form of fibrinogen. Fibrin stabilises the primary platelet plug by cross-linking the platelets to each other and to the damaged blood vessel wall to prevent further blood loss (secondary haemostasis).

Anticoagulants and antiplatelet drugs act at different stages in the coagulation process. Antiplatelet drugs, including aspirin, dipyridamole and clopidogrel, interfere with platelet aggregation, by reversibly or irreversibly inhibiting various steps in the platelet activation required for primary haemostasis. The various anticoagulant drugs inhibit the production or activity of the factors that are required for the coagulation cascade. For example, warfarin and the other vitamin K antagonists (VKAs; acenocoumarol and phenindione) work by inhibiting the vitamin K-dependent modification of prothrombin and other coagulation factors, which is required for their normal function, and in this way they impair secondary haemostasis.

Blood coagulation in response to injury is an essential process. However, certain medical conditions, including arteriosclerosis and cardiac arrhythmias, can predispose individuals to the risk of a thrombosis, where a blood clot (thrombus) blocks a blood vessel, either at the site of formation or after travelling to another critical site (thromboembolism), with potentially catastrophic consequences such as heart attack, pulmonary embolism or stroke. Anticoagulants and antiplatelet drugs are prescribed to reduce the risk of such an event in patients with vascular, thromboembolic or cardiac conditions, a history of stroke or following surgical procedures such as heart valve replacements, cardiac stents and joint replacements.

However, this reduction in risk of thromboembolic events comes at the cost of an increased risk of bleeding, either spontaneously or associated with invasive procedures. The balance of these risks for an individual patient is the primary consideration in the management of dental patients who are taking anticoagulants or antiplatelet drugs and require dental treatment.

The anticoagulants and antiplatelet drugs prescribed in the UK are listed in Appendix 2, and the conditions for which they are commonly prescribed are indicated in Appendix 3.

2.2 The new anticoagulants and antiplatelet drugs

Warfarin has been in use for over 50 years and is still one of the most widely used medications for the treatment and prophylaxis of thromboembolism. However, it does have
a number of limitations, including a narrow therapeutic range, sensitivity to diet and drug interactions and the requirement for frequent monitoring and dose adjustment\textsuperscript{6}. Since 2008, a group of newer oral anticoagulants has been available which overcome many of these limitations\textsuperscript{7}. Dabigatran is a direct inhibitor of the coagulation factor thrombin, while apixaban and rivaroxaban inhibit Factor Xa of the coagulation cascade. These drugs produce a more predictable level of anticoagulation than warfarin and so do not require monitoring, are easier to manage and are potentially more effective and safer. These drugs are now licensed for use in the UK for a number of indications (see Appendix 3) and consequently the number of patients who present for dental treatment while taking these drugs is increasing. Notably, the National Institute of Health and Care Excellence (NICE) now recommends the use of apixaban, rivaroxaban and dabigatran in preference to aspirin for stroke prevention in patients with atrial fibrillation\textsuperscript{8}.

Two new generation antiplatelet drugs\textsuperscript{9}, namely prasugrel and ticagrelor, have also become available in recent years, providing alternatives to clopidogrel. These are more potent antiplatelet agents with a more rapid onset of action, more predictable absorption and improved efficacy for some outcomes. Their use is currently limited to patients with acute coronary syndrome and coronary stents and each is usually prescribed in combination with aspirin, as a dual therapy\textsuperscript{10,11}. 

\textsuperscript{6} SDCEP Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and Require Dental treatment
\textsuperscript{7} SDCEP Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and Require Dental treatment
\textsuperscript{8} SDCEP Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and Require Dental treatment
\textsuperscript{9} SDCEP Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and Require Dental treatment
\textsuperscript{10} SDCEP Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and Require Dental treatment
\textsuperscript{11} SDCEP Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and Require Dental treatment
3 Assessing bleeding risk

Before providing dental treatment for a patient taking anticoagulants or antiplatelet drugs, their bleeding risk should be assessed. This involves consideration of both the likely risk of bleeding associated with the required dental treatment and the patient’s individual level of bleeding risk, which can be affected by the anticoagulants or antiplatelet medication that they are taking, in addition to other medical conditions and medications. These issues are addressed in Sections 3.1 and 3.2. Guidance on the management of the patient’s dental treatment based on this risk assessment is presented in Sections 4 to 8.

While the risk of bleeding complications associated with dental treatment for these patients should be taken seriously, it should be noted that existing evidence and clinical experience suggest that serious adverse bleeding events are rare. For example, the incidence of significant bleeding after dental procedures (defined as that requiring an unplanned intervention including repacking and resuturing, or transfusion in extreme cases) for patients who have continued their warfarin therapy perioperatively, is estimated at less than 4%\(^1\).

3.1 Which dental treatments carry the highest bleeding risks?

Table 1 categorises dental procedures into those that are unlikely, under normal circumstances, to cause bleeding and those that can be expected to cause some level of bleeding. The management of patients taking anticoagulants or antiplatelet drugs whose dental treatment involves procedures from the first category should be straightforward and these patients can be treated according to standard practice, with care taken to avoid causing bleeding (see Section 4). More careful consideration should be given to patients who require procedures likely to result in bleeding (see Sections 5 to 8). Dental procedures that are likely to result in bleeding are further categorised in Table 1 into those with a low risk of post-operative bleeding complications and those that are judged to be more invasive and potentially carry a relatively higher risk of bleeding complications. By bleeding complications we mean prolonged or excessive bleeding or bleeding not controlled by initial haemostatic measures. Note that the use of the term ‘higher risk’ is not intended to suggest that these are high risk treatments.
Table 1. Postoperative bleeding risks for dental procedures

<table>
<thead>
<tr>
<th>Dental procedures that are <strong>unlikely to cause bleeding</strong></th>
<th>Dental procedures that are <strong>likely to cause bleeding</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong> risk of post-operative bleeding complications</td>
<td><strong>Higher</strong> risk of post-operative bleeding complications</td>
</tr>
<tr>
<td>Local anaesthesia by infiltration, intraligamentary or mental nerve block</td>
<td>Complex extractions, adjacent extractions that will cause a large wound or greater than 3 extractions</td>
</tr>
<tr>
<td>Local anaesthesia by inferior dental block or other regional nerve blocks</td>
<td>Flap raising procedures:</td>
</tr>
<tr>
<td>Basic periodontal examination (BPE)</td>
<td>- Elective surgical extractions</td>
</tr>
<tr>
<td>Supragingival removal of plaque, calculus and stain</td>
<td>- Periodontal surgery</td>
</tr>
<tr>
<td>Simple restorative treatment</td>
<td>- Preprosthetic surgery</td>
</tr>
<tr>
<td>Indirect restorations with supragingival margins</td>
<td>- Periradicular surgery</td>
</tr>
<tr>
<td>Endodontics - orthograde</td>
<td>- Crown lengthening</td>
</tr>
<tr>
<td>Impressions and other prosthetics procedures</td>
<td>- Dental implant surgery</td>
</tr>
<tr>
<td>Fitting and adjustment of orthodontic appliances</td>
<td>Gingival recontouring</td>
</tr>
<tr>
<td></td>
<td>Biopsies</td>
</tr>
</tbody>
</table>

Note that this table is intended to be a guide only and that bleeding risk assessment for a patient’s dental treatment is likely to require further judgement on an individual case basis. Before performing a dental procedure that is likely to cause bleeding, on a patient taking anticoagulants or antiplatelet drugs, the dentist or dental care professional should use their clinical judgement to determine whether they are sufficiently confident and skilled in the procedure and management of the associated peri-operative bleeding. If in doubt, they should seek advice from or refer the patient to a suitably experienced colleague in primary or secondary dental care.

### 3.2 Which patients have the highest bleeding risk?

A patient’s individual risk of bleeding complications is dependent on a variety of factors, including the type and combination of anticoagulants or antiplatelet drugs they are taking, their underlying health conditions and other medications that they may be taking. The
patient’s medical history and details of the prescribed and non-prescribed medication they are taking should be noted at the start of each course of treatment and checked for any changes at each visit (see Section 3.3).

3.2.1 Bleeding risks associated with different anticoagulants and antiplatelet drugs

There is currently insufficient evidence to compare the relative bleeding risks associated with the various anticoagulant and antiplatelet medications, including the newer drugs, for dental patients. According to the clinical trials conducted by the drug manufacturers, incidences of major bleeding events for patients with atrial fibrillation taking dabigatran, apixaban or rivaroxaban were similar or lower than for those taking warfarin. However, it should be noted that these bleeding rates included spontaneous and procedural bleeding and may not be meaningful for dental treatments.

Patients who are on dual or combination therapies and are taking more than one anticoagulant or antiplatelet drug are likely to have a higher bleeding risk than those on single drug therapies.

The clinical experience of dental professionals suggests that dual antiplatelet medication can lead to prolonged bleeding following an invasive procedure. However, once formed, the clot tends to be reasonably stable. Conversely, clinical experience suggests that for patients taking anticoagulants, blood clots may form more quickly than with antiplatelets, but can also be more easily dislodged. The use of sutures at the time of treatment, in addition to haemostatic packing, can stabilise the wound and may reduce the likelihood of subsequent rebleeding and the need for the patient to return for further treatment.

3.2.2 Bleeding risks associated with other medical conditions

Certain medical conditions are known to be associated with an increased bleeding risk, due to effects on either coagulation or platelet function and should be taken into consideration when planning dental treatment for any patient. Although these effects are not dependent on the patient’s anticoagulation medication, it is especially important that the dentist recognises these as additional risk factors that can contribute to post-operative bleeding complications in patients taking anticoagulants or antiplatelet drugs. It is not possible to give an exhaustive list but the main conditions which could be relevant for patients also being treated with anticoagulants or antiplatelet drugs are shown in Table 2.
Table 2. Medical conditions associated with increased bleeding risk

<table>
<thead>
<tr>
<th>Medical condition</th>
<th>Increased bleeding due to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic renal failure</td>
<td>Associated platelet dysfunction</td>
</tr>
<tr>
<td>Liver disease (e.g. caused by alcohol dependence, chronic viral hepatitis,</td>
<td>Reduced production of coagulation factors</td>
</tr>
<tr>
<td>autoimmune hepatitis, primary biliary cirrhosis)</td>
<td>Reduction in platelet number and function due to bone marrow toxicity</td>
</tr>
<tr>
<td>Haematological malignancy or myelodysplastic disorder</td>
<td>Impaired coagulation or platelet function (even in remission)</td>
</tr>
<tr>
<td>Previous or current chemotherapy</td>
<td>Pancytopenia including reduced platelet numbers</td>
</tr>
<tr>
<td>Advanced heart failure</td>
<td>Resulting liver failure</td>
</tr>
<tr>
<td>Mild forms of inherited bleeding disorders including haemophilia and von Willebrand's Disease (Patients with severe forms of these conditions would be unlikely to be taking anticoagulants or antiplatelet drugs)</td>
<td>Defective or reduced levels of coagulation factors</td>
</tr>
<tr>
<td>Idiopathic thrombocytopenic purpura (ITP)</td>
<td>Reduced platelet numbers</td>
</tr>
</tbody>
</table>

For medically complex patients such as these, the patient’s general medical practitioner or specialist should be consulted, if required, to establish the extent of the disease in order to assess the likely impact on the bleeding risk for the dental procedure. Further advice may be sought from suitably qualified colleagues in primary or secondary dental care.

3.2.3 Bleeding risks associated with prescribed or self medications

In addition to the medical conditions discussed above, a number of different medications can exacerbate a patient’s bleeding risk over and above the effects of the anticoagulants or antiplatelet drugs they are taking. Groups of drugs to be aware of include:

- Other anticoagulants or antiplatelet drugs:
  Some patients can be on dual or even multiple antiplatelet or anticoagulant therapies, or on combination therapies. These patients are likely to have a higher risk of bleeding complications than those on single drug regimes. Be aware that patients may also be taking non-prescribed aspirin, and as an antiplatelet agent this can in effect convert a prescribed monotherapy into a dual therapy.

- Cytotoxic drugs/drugs associated with bone marrow suppression:
  e.g. leflunamide, hydrochloroquine, adalimumab, infliximab, etanercept, sulfasalazine, penicillamine, gold, methotrexate, azathioprine, mycophenolate
These can reduce platelet numbers and impair liver function affecting production of coagulation factors.

- Non-steroidal anti-inflammatory drugs (NSAIDS):
  - e.g. aspirin, ibuprofen, diclofenac and naproxen which can impair platelet function.

- Drugs affecting the nervous system:
  - e.g. SSRI (selective serotonin reuptake inhibitors) antidepressants which may in combination with other antiplatelets increase the bleeding time
  
  Note that the effects of the following drugs on bleeding are considered uncommon or rare:
  - Gabapentin which can in rare cases impair platelet function and increase bleeding time;
  - carbamazepine which can in rare cases suppress bone marrow leading to thrombocytopenia

For the management of patients taking these additional medications, the patient’s general medical practitioner or specialist, or a suitably qualified colleague in primary or secondary dental care, could be consulted in order to assess the likely impact on bleeding risk for the dental procedure.

### 3.3 Advice for assessing bleeding risk

The following best practice advice suggests steps for assessing a patient’s likely risk of bleeding complications:

- Ask the patient about their current or planned use of anticoagulants, antiplatelets and other prescribed and non-prescribed medications, when taking or confirming their medical history.
  - Dentists should be aware that a patient may not know that their medication is an anticoagulant or antiplatelet drug. A list of anticoagulants and antiplatelet drugs which may be encountered for outpatients attending in the UK can be found in Appendix 2.
  - Other medications that can also affect a patient’s bleeding risk are listed in Section 3.2.3.
  - Be aware that many patients take non-prescribed medications such as aspirin, or other NSAIDs. Patients taking these are likely to have a higher bleeding risk.

- Ask the patient whether their anticoagulant or antiplatelet treatment is lifelong or for a limited time.
  - If the patient is on time-limited medication, it may be possible to delay dental treatment until they have stopped taking the drug(s).

- Ask the patient about any medical conditions that they have.
  - The medical conditions for which anticoagulants and antiplatelet drugs are commonly prescribed in the UK are listed in Appendix 3. If a patient is suffering from one or more of these conditions, they may be taking an anticoagulant or antiplatelet drug.
  - Patients with prosthetic metal heart valves or coronary stents are at higher risk of a thromboembolic event and must not have their anticoagulation medication altered,
except under direct instruction from their cardiologist.

- Some patients may have other conditions such as kidney or liver disease that can affect their coagulation and platelet function (Section 3.2.2).

- Ask about the patient’s bleeding history (e.g. incidences of bleeding requiring retreatment or a hospital visit, prolonged bleeding from other wounds, spontaneous bleeding, easy bruising etc.)
- A patient’s previous experience of bleeding in response to invasive dental or surgical procedures or to trauma may be a useful indicator of the likelihood of bleeding complications from the current dental treatment.

For some indications, anticoagulants and antiplatelet drugs may only be prescribed for a limited period of time (Appendix 3). Where practical, dental procedures likely to cause bleeding should be deferred until the drug treatment is complete. If the medication is being taken in preparation for an elective surgical procedure, it may be possible, in a dental emergency, to interrupt the drug treatment in liaison with the surgical consultant. For high risk conditions such as coronary stent placement, the patient’s drug regime should on no account be modified or interrupted, unless directly indicated by the patient’s cardiologist.
4  General advice for managing bleeding risk

The following best practice advice is based on clinical experience and expert opinion:

For a patient who is taking anticoagulants or antiplatelet drugs, and requires dental treatment that is likely to cause bleeding (Table 1):

- If the patient has another relevant medical condition(s) or is taking other medications that may increase bleeding risk (Sections 3.2.2 and 3.2.3), consult with the patient’s general medical practitioner or specialist, if required, for more information. If necessary seek advice from, or refer to, a suitably qualified colleague in primary or secondary dental care.

- If the patient is on a time-limited course of anticoagulant or antiplatelet medication, delay non-urgent, invasive dental procedures where possible until the medication has been discontinued.

- Plan treatment for early in the day and week, where possible, to allow time for the management of prolonged bleeding or rebleeding episodes, should they occur.

- Only proceed with treatment where there is adequate access to emergency care services.
  - Dentists practicing in remote or rural locations with limited or lengthy access to secondary dental or medical care should be aware of local policies and procedures to address these issues.

- Perform the procedure as atraumatically as possible.

- Provide the patient with written post-treatment advice and emergency contact details. For a patient information leaflet, see appendix 5.

For specific advice and recommendations for the management of patients taking particular anticoagulants or antiplatelet drugs see Sections 5 to 8.

4.1  Haemostatic measures

The dental practitioner should have the necessary equipment and skills to perform appropriate local haemostatic measures competently for dental procedures likely to cause bleeding. These include packing any open sockets with haemostatic material and placing sutures\textsuperscript{15}. It is considered best practice to routinely suture wounds for all patients taking anticoagulants or antiplatelets, to stabilise the clot, packing material and wound margins, unless suturing is likely to cause further trauma.
The dental practitioner should have available:

- Absorbent gauze
- Haemostatic packing material (e.g. oxidized cellulose, collagen sponge)
- Suture kit (needle holders, tissue forceps, suture material, scissors)

Note: Some of these materials contain animal based protein which may not be acceptable to all patients, for ethical or religious reasons. Dentists should ensure that a non-animal based product is also available.

4.1.1 Tranexamic acid

Some guidelines recommend the use of tranexamic acid mouthwash as a further haemostatic measure. However, there is insufficient evidence to indicate any additional benefit when used in conjunction with other haemostatic measures for dental procedures\(^1\). Tranexamic acid is not included in the List of Dental Preparations in the British National Formulary (BNF)\(^{16}\) and therefore cannot be prescribed on the NHS. In addition, tranexamic acid is expensive and is not available as a mouthwash so has to be prepared and prescribed off licence. Based on these considerations, this guidance does not advise dental practitioners to prescribe tranexamic acid for dental procedures in primary care.
5 TREATING A PATIENT TAKING WARFARIN OR ANOTHER VITAMIN K ANTAGONIST

Although the use of warfarin is well established, managing its therapeutic anticoagulation activity can be complicated. Because of substantial drug and dietary interactions, variation in patients’ responses to the drug and its narrow therapeutic range, warfarin activity has to be monitored frequently. This is achieved using the INR (International Normalised Ratio) test, which measures the time taken for a clot to form in a blood sample, relative to a standard. An INR value of 1, indicates a level of coagulation equivalent to that of an average patient not taking warfarin, and values greater than 1 indicate a longer clotting time and thus a longer bleeding time. The INR test is also used for patients taking the less commonly used VKAs, acenocoumarol and phenindione.

The different drug indications have different target INR levels, ranging from 2.5-3.5±0.5, and a patient’s warfarin therapy will be adjusted by their medical practitioner or anticoagulation service (or by the patient themself if self-monitoring) as necessary to achieve the target INR level appropriate for their medical condition. Warfarinised patients will have a record of their INR test results, which they should present when attending for dental treatment.

Key Recommendation:

Treat patients with a stable INR below 4, without interrupting warfarin or the other vitamin K antagonists.

This recommendation is based on the available evidence and extensive clinical experience. It should be considered a strong recommendation, because of emphasis placed on the potential risk of a thromboembolic event if treatment is interrupted. Further details on the development of the recommendations can be found in Appendix 1 or are available on request.

For a patient who is taking warfarin or another vitamin K antagonist and requires dental treatment that is unlikely to cause bleeding (Table 1):

- Treat the patient following standard procedures, taking care to avoid causing bleeding.

For a patient who is taking warfarin or another vitamin K antagonist, and requires dental treatment that is likely to cause bleeding, with either a low or higher risk of bleeding complications (Table 1):

- Ensure that the patient’s INR has been checked no more than 72 hours before the...
procedure. If the patient has an unstable INR, the INR should be checked no more than 24 hours before.

- If the patient’s INR is above 4, inform the patient’s general medical practitioner or anticoagulation service and delay treatment until the patient’s INR has been reduced to 4 or less. For urgent treatment, refer the patient to secondary dental care.

- If the patient’s INR is 4 or below, treat according to the general advice for managing bleeding risk (Section 4).

In addition:

- Consider limiting the initial treatment area (e.g. perform a single extraction or limit subgingival periodontal scaling to 3 teeth, then assess bleeding before continuing).

- For procedures with a higher risk of post-operative bleeding complications (Table 1), consider carrying out the treatments in a staged manner over separate visits or seek advice from a suitably experienced colleague in primary or secondary care.

- Use local haemostatic measures to achieve haemostasis. This would usually involve the use of haemostatic packing material and sutures (Section 4.1).
6 Treating a patient taking an antiplatelet drug(s)

Patients taking antiplatelet medications tend to have prolonged bleeding times, which is a consequence of the requirement for platelet aggregation in the formation of the initial platelet plug in primary haemostasis. This should be taken into consideration when planning dental treatments likely to cause bleeding, to ensure that sufficient time is available to achieve and monitor haemostasis.

There is no suitable test equivalent to the INR for measuring the antiplatelet effect of the various drugs that patients may be taking. Patients on dual antiplatelet therapies may have a higher risk of prolonged bleeding compared to those on a single antiplatelet drug and should be managed accordingly.

The most commonly encountered antiplatelet combination is aspirin with clopidogrel (for acute coronary syndrome). Dipyridamole with aspirin after a stroke or TIA is less commonly prescribed now, since clopidogrel monotherapy is considered to be more effective and better tolerated. The newer antiplatelet drugs prasugrel and ticagrelor are only prescribed in combination with aspirin and they are currently only licensed for patients with acute coronary syndrome. Evidence relating to bleeding risks with prasugrel and ticagrelor in the context of dental procedures is lacking.

Patients with a coronary artery stent will be prescribed dual antiplatelet therapy for up to 12 months. It is extremely important that this treatment is not stopped prematurely or interrupted without prior discussion with the patient's cardiologist because of the risk of major adverse cardiac events.

Key Recommendation:

Treat patients without interrupting single or dual antiplatelet drugs.

This recommendation is based on the available evidence and extensive clinical experience. It should be considered a strong recommendation, because of emphasis placed on the potential risk of a thromboembolic event if treatment is interrupted. Further details on the development of the recommendations can be found in Appendix 1 or are available on request.

For a patient who is taking single or dual antiplatelet drugs and requires dental treatment that is unlikely to cause bleeding (Table 1):

- Treat the patient following standard procedures, taking care to avoid causing bleeding.
For a patient who is taking aspirin alone and requires dental treatment that is **likely** to cause bleeding, with a low or higher risk of bleeding complications (Table 1):

- Treat the patient according to the general advice for managing bleeding risk (Section 4)

**In addition:**

- Consider limiting the initial treatment area (e.g. perform a single extraction or limit subgingival periodontal scaling to 3 teeth, then assess bleeding before continuing).

- For procedures with a higher risk of post-operative bleeding complications (Table 1), consider carrying out the treatments in a staged manner over separate visits or seek advice from a suitably experienced colleague in primary or secondary care.

- Use local haemostatic measures to achieve haemostasis. This would usually involve the use of haemostatic packing material and sutures (Section 4.1).

For a patient who is taking a single antiplatelet drug, other than aspirin, or dual antiplatelet drugs and requires dental treatment that is **likely** to cause bleeding, with either a low or higher risk of bleeding complications (Table 1):

- Treat the patient according to the general advice for managing bleeding risk (Section 4)

**In addition:**

- Be aware that bleeding may be prolonged (up to an hour). This should be considered when planning treatment time.

- Initial treatments should be limited to single extractions or subgingival periodontal scaling on up to 3 teeth, to allow assessment of the patient’s bleeding before continuing.

- For procedures with a higher risk of post-operative bleeding complications (Table 1), assess the need to carry out the treatments in a staged manner over separate visits, or seek advice from a suitably experienced colleague in primary or secondary care.

- Use local haemostatic measures to achieve haemostasis. This would usually involve the use of haemostatic packing material and sutures (Section 4.1).
For some patients other combinations of medications are prescribed, including aspirin with warfarin or clopidogrel with warfarin or in rare cases, triple drug combinations. These patients are likely to have a higher bleeding risk and may have additional medical complications.

For a patient who is taking other combinations of antiplatelet drugs and/or anticoagulants and requires dental treatment that is likely to cause bleeding, with either a low or higher risk of bleeding complications (Table 1):

- Consult with the patient’s general medical practitioner or the prescribing physician in order to assess the likely impact on bleeding risk for the dental procedure. If necessary seek advice from, or refer to, a suitably experienced colleague in primary or secondary dental care.
7 Treating a patient taking one of the newer oral anticoagulants

The INR test is not suitable for assessing coagulation levels in patients taking dabigatran, apixaban or rivaroxaban, and alternative laboratory tests are not yet widely available. However, monitoring for these drugs is considered less important than for warfarin, since they provide more predictable anticoagulation in treated patients.

Compared to warfarin, the NOACs exhibit a rapid onset of action (2-4 hours) and have relatively short half-lives (5-13 hours for rivaroxaban, ~12 hours for apixaban and ~13 hours for dabigatran, depending on renal function). Because of these pharmacokinetic properties, it is possible to modify an individual’s anticoagulation status quite rapidly, minimising the period where the anticoagulation activity is therapeutically sub-optimal. Although in development, there are not as yet any simple reversal agents available for the NOACs. However the short half-lives of these drugs allow for the relatively rapid reduction of their anticoagulation effects.

There are currently no published clinical trials specifically assessing the bleeding risks associated with dental procedures for patients taking the NOACs.

Key Recommendations:

Treat patients requiring a dental procedure that is unlikely to cause bleeding or with a low risk of bleeding complications, without interrupting their NOAC therapy.

Advise patients requiring dental treatment with a higher risk of bleeding complications to miss or delay their morning dose of apixaban, dabigatran or rivaroxaban on the day of their dental treatment.

There is a lack of direct clinical evidence and clinical experience to favour either continuing or interrupting NOAC treatment for invasive dental treatments. The recommendations given are based on the balance of likely effects of each option for each dental procedure, the known characteristics of the drugs, such as their short half-lives and rapid onset of action, recommendations made by the drug manufacturers, and consensus of expert opinion. It is judged to be a weak recommendation because of the lack of evidence and the fine balance between the potential risks and benefits of the treatment options.

The estimated risk to the patient of a thromboembolic event resulting from brief NOAC interruption is judged to be extremely small, while the risk of a bleeding complication if the NOAC is continued is likely to be small but also depends on the procedure involved and the individual patient. However, both risks are judged to be uncertain, because of the lack of evidence. Because the potential risks of either continuing or interrupting a patient’s NOAC
medication are so finely balanced, the treatment options and risks should be discussed with the patient.

Further details on the development of the recommendations can be found in Appendix 1 or are available on request.

For a patient who is taking a NOAC and requires dental treatment that is **unlikely** to cause bleeding (Table 1):

- Treat the patient following standard procedures, taking care to avoid causing bleeding and without advising the patient to miss or delay a dose of their medication.

The consensus of expert opinion is that it is not necessary to miss or delay a dose of a NOAC for dental procedures that are **unlikely** to cause bleeding (Table 1).

For a patient who is taking a NOAC and requires dental treatment that is **likely** to cause bleeding with a **low** risk of bleeding complications (Table 1):

- Treat the patient according to the general considerations for managing bleeding risk (Section 4), without advising the patient to miss or delay a dose of their medication.

  **In addition:**

  - Plan treatment for first thing in the morning to allow for monitoring and treatment of unexpected bleeding issues.
  
  - Limit extractions to a single tooth or subgingival periodontal scaling to 3 teeth, then assess the patient’s bleeding before continuing.
  
  - Carry out haemostatic packing and suturing routinely (Section 4.1).

The consensus of expert opinion is that it is not necessary to miss or delay a dose of a NOAC for dental procedures that are likely to cause bleeding, but which have a low risk of bleeding complications (Table 1). Although treating a patient in the morning, as advised, is more likely to coincide with the relative peak of drug concentration, this risk was judged to be outweighed by the importance of being able to deal with a bleeding complication, should it occur, within surgery hours.

For a patient who is taking a NOAC and requires dental treatment that is **likely** to cause bleeding with a **higher** risk of bleeding complications (Table 1):

- Advise the patient to miss or delay their morning dose of apixaban, dabigatran or rivaroxaban on the day of their dental treatment, and treat according to the general considerations for managing bleeding risk (Section 4).
In addition:

- Plan treatment for first thing in the morning to allow for monitoring and management of bleeding complications, should they occur.

- Assess the need to carry out the treatments in a staged manner over separate visits, or seek advice from a suitably experienced colleague in primary or secondary care.

- Carry out haemostatic packing and suturing routinely (Section 4.1).

- Advise the patient to wait until haemostasis is achieved, or a minimum of 4 hours before restarting their medication.
  - Assuming the bleeding has stopped, a patient on a twice daily medication (apixaban, dabigatran, and rivaroxaban in some cases) could take the next dose at the usual time; a patient on a once daily schedule (rivaroxaban) may restart their medication 4 hours after treatment and then continue as normal the following day.

The consensus of expert opinion is that patients should be advised to miss a dose of a NOAC prior to dental procedures that are likely to cause bleeding and which have a higher risk of bleeding complications (Table 1).
8 Treating a patient taking an injectable anticoagulant

Dalteparin, enoxaparin and tinzaparin are administered parenterally by subcutaneous injection rather than orally as for the other treatments discussed, and although used in limited patient groups, they may still be encountered in a primary dental setting. Patients taking these low molecular weight heparins (LMWHs) can include pregnant woman with indications for anticoagulation and patients with venous thrombosis with a background of cancer. The dosage of these drugs can be once or twice a day and either prophylactic or therapeutic\textsuperscript{28-30}. Like the NOACs, these drugs have a short onset of action and a short half-lives.

There is a lack of direct clinical evidence regarding the dental treatment of patients taking injectable anticoagulants, including the LMWHs. Furthermore, patients taking these drugs are likely to have varied conditions and drug regimes such that further information is required to make a reasonable judgement on treatment management.

For a patient who is taking an injectable anticoagulant and requires dental treatment that is\textbf{ unlikely} to cause bleeding (Table 1):

- Treat the patient following standard procedures, taking care to avoid causing bleeding.

For a patient who is taking an injectable anticoagulant and requires dental treatment that is\textbf{ likely} to cause bleeding (Table 1):

- Consult with the patient’s general medical practitioner or specialist to establish the patient’s medical condition and medication regime in order to assess the likely impact on bleeding risk for the dental procedure. If necessary seek advice from, or refer to, a suitably experienced colleague in primary or secondary care.
9 Drug prescribing for patients taking anticoagulant or antiplatelet medications

There are a large number of documented interactions between the anticoagulant or antiplatelet medications and other prescription drugs. The current BNF\(^ 16\) or individual drug Summary of Product Characteristics (SPC) sheets, available on the electronic Medicines Compendium (eMC) website\(^ {31}\) should be consulted for complete listings. For the purposes of this guidance only the interactions between anticoagulant and antiplatelet medications and drugs that are available in the BNF Dental Practitioner’s Formulary are considered. These interactions are listed in Appendix 4.

Drugs that are likely to increase the anticoagulant or antiplatelet effect of the existing medication have the potential to increase the patient’s bleeding risk. NSAIDS including aspirin, ibuprofen and diclofenac fall into this interacting group for most of the anticoagulant and antiplatelet medications. Conversely, drugs which can decrease the anticoagulant or antiplatelet effect of the existing medication (e.g. carbamazepine) have the potential to increase the patient’s thromboembolic risk. If it is necessary for a dentist to prescribe such a drug, this should be done in consultation with the patient's general medical practitioner.
Appendix 1. Guidance development

The Scottish Dental Clinical Effectiveness Programme

The Scottish Dental Clinical Effectiveness Programme (SDCEP) is an initiative of the National Dental Advisory Committee (NDAC) and operates within NHS Education for Scotland (NES).

The NDAC comprises representatives of all branches of the dental profession and acts in an advisory capacity to the Chief Dental Officer. It considers issues that are of national importance in Scottish dentistry and also provides feedback to other bodies within the Scottish Government on related, relevant healthcare matters.

SDCEP was established in 2004 under the direction of the NDAC to give a structured approach to providing clinical guidance for the dental profession. The programme’s primary aim is to develop guidance that supports dental teams to provide quality patient care. SDCEP brings together the best available information that is relevant to priority areas in dentistry, and presents guidance on best practice in a form that can be interpreted easily and implemented. The guidance recommendations may be based on a variety of sources of information, including research evidence, guidelines, legislation, policies and expert opinion as appropriate to the subject. SDCEP guidance takes a variety of forms to suit the diverse topics being addressed.

Recognising that publication of guidance alone is likely to have a limited influence on practice, SDCEP also contributes to the research and development of interventions to enhance the translation of guidance recommendations into practice through its participation in the TRiADS (Translation Research in a Dental Setting) collaboration (www.triads.org.uk).

SDCEP is funded by NHS Education for Scotland and has made important contributions to the implementation of the Scottish Government’s Dental Action Plan, which aims to both modernise dental services and improve oral health in Scotland.

The Guidance Development Group

A Guidance Development Group (GDG), comprising individuals from a range of branches of the dental and medical professions and a patient representative, was convened to develop and write this guidance.

<table>
<thead>
<tr>
<th>Garry Sime (Chair)</th>
<th>Senior Dental Officer and Specialist in Special Care Dentistry, NHS Tayside</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carol Armstrong</td>
<td>Dental Tutor Therapist, UHI SOHS, NHS Dumfries &amp; Galloway</td>
</tr>
<tr>
<td>Dean Barker</td>
<td>Consultant in Restorative Dentistry/Honorary Clinical Senior Lecturer, University of Aberdeen Dental School and Hospital</td>
</tr>
<tr>
<td>Adrian Brady</td>
<td>Consultant Cardiologist, NHS Greater Glasgow &amp; Clyde; Associate Professor, University of Glasgow</td>
</tr>
</tbody>
</table>
The Guidance Development Group would like to thank Anne Littlewood, Trials Search Coordinator, Cochrane Oral Health Group, for performing the literature searches that underpin the development of this guidance.

### The Programme Development Team

The Guidance Development Group works closely with the Programme Development Team, which provides project management and administrative support and is responsible for the methodology of guidance development. The team facilitates all aspects of guidance development by searching and appraising information and evidence, conducting research, liaising with external organisations, editing the guidance, and managing the publication and dissemination of guidance materials.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patricia Green</td>
<td>Patient Representative and Anticoagulation Europe (ACE) Local Patient Contact, Aviemore</td>
</tr>
<tr>
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<td>Dentist, Salaried Dental Service, NHS Orkney</td>
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<td>Douglas Kennedy</td>
<td>Consultant in Oral &amp; Maxillofacial Surgery, NHS Tayside</td>
</tr>
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<td>Clare Marney</td>
<td>Consultant in Oral Medicine, Dundee Dental Hospital and School</td>
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<td>Steve McGlynn</td>
<td>Specialist Principal Pharmacist (Cardiology), NHS Greater Glasgow &amp; Clyde; Honorary Senior Teaching Fellow, University of Strathclyde</td>
</tr>
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<td>Namita Nayyer</td>
<td>Specialist Trainee in Oral Surgery, Dundee Dental Hospital and School</td>
</tr>
<tr>
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<td>Consultant in Oral Surgery, Dundee Dental Hospital and School</td>
</tr>
<tr>
<td>Gillian Nevin</td>
<td>General Dental Practitioner, Coupar Angus; Assistant Director of Postgraduate GDP Education, Dundee Dental Education Centre</td>
</tr>
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<td>Christine Randall</td>
<td>Senior Medicines Information Pharmacist and UKMi Representative, North West Medicines Information Centre, Liverpool</td>
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<tr>
<td>Simon Randfield</td>
<td>General Practitioner, NHS Forth Valley</td>
</tr>
<tr>
<td>Petrina Sweeney</td>
<td>Senior Lecturer/Honorary Consultant in Special Care Dentistry, University of Glasgow Dental School</td>
</tr>
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<td>Campbell Tait</td>
<td>Consultant Haematologist, NHS Greater Glasgow &amp; Clyde</td>
</tr>
<tr>
<td>Liz Theaker</td>
<td>Consultant in Oral Medicine, Dundee Dental Hospital and School</td>
</tr>
<tr>
<td>John Wall</td>
<td>General Dental Practitioner, Perth</td>
</tr>
</tbody>
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### The Guidance Development Group

The Guidance Development Group works closely with the Programme Development Team, which provides project management and administrative support and is responsible for the methodology of guidance development. The team facilitates all aspects of guidance development by searching and appraising information and evidence, conducting research, liaising with external organisations, editing the guidance, and managing the publication and dissemination of guidance materials.

<table>
<thead>
<tr>
<th>Name</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Jan Clarkson*</td>
<td>Professor of Clinical Effectiveness, University of Dundee; SDCEP Director</td>
</tr>
<tr>
<td>Douglas Stirling*</td>
<td>Programme Manager – Guidance and Programme Development</td>
</tr>
<tr>
<td>Michele West*</td>
<td>Research and Development Manager – Guidance Development and lead for The Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and require Dental Treatment</td>
</tr>
<tr>
<td>Linda Young*</td>
<td>Research and Development Manager – Evaluation of Implementation</td>
</tr>
</tbody>
</table>
Guidance Development Methodology

SDCEP endeavours to use a methodology for guidance development that reflects that used to develop high quality guidelines. It aims to be transparent, systematic and to adhere as far as possible to international standards set out by the AGREE (Appraisal of Guidelines Research and Evaluation) Collaboration (www.agreetrust.org).

Following the TRiaDS framework for translating guidance recommendations into practice, the views of general dental practitioners on current practice, attitudes to the management of patients taking anticoagulants or antiplatelet drugs and preferred content of this guidance were obtained via telephone interviews. Patient experiences and views were obtained via a questionnaire posted online and distributed through local anticoagulation clinics. This research was used to inform the scope and content of the guidance and the strategy for identifying evidence.

The guiding principle for developing guidance within SDCEP is to first source existing guidelines, policy documents, legislation or other recommendations. Similarly, relevant systematic reviews are also initially identified. These documents are appraised for their quality of development, evidence base and applicability to the remit of the guidance under development. In the absence of these documents or when supplementary information is required, other published literature and unpublished work may be sought.

For this guidance, a comprehensive search of MEDLINE, EMBASE and CINAHL was conducted on the 6th October 2014 and of the Cochrane Database of Systematic Reviews and the Cochrane Database of Abstracts of Reviews of Effects on the 10th October 2014. Each database was queried using 3 groups of search terms: ‘anticoagulant terms with dental treatment terms’, ‘anticoagulant terms with surgical terms’ and ‘anticoagulants terms with risk terms’. The second and third searches were broader than the first and designed to retrieve any indirect non-dental evidence relating to other surgical and non-surgical bleeding risks. The 3 searches retrieved 520, 7260 and 14967 records, respectively.

Potentially eligible articles were identified separately by two reviewers from the list of titles and abstracts retrieved by the dental specific search. An article was considered potentially eligible if it met all of the following criteria:

1. The article was a systematic review or a guideline. An article would be included as a systematic review, if it included a methods section, a search of 1 or more electronic databases and a table of included studies.
2. Articles referred to (i) anticoagulants or antiplatelets and (ii) bleeding or thromboembolic risk in the context of dental treatment.

Where insufficient evidence relevant to dental treatments was obtained, the search results from the broader ‘surgical’ and ‘risk’ searches were queried using individual anticoagulant terms.

Copies of all potentially eligible articles in full were retrieved. Additional manual searching of guideline repositories and other resources, and follow up of citations from relevant articles found through the systematic searching was also carried out. Other sources of evidence identified by GDG members were also considered, taking relevance and methodological quality into account.

A list of clinical questions related to the scope of the guidance was compiled by members of the GDG and eligible articles which were relevant for each question were identified. Precedence was given to the most recent articles, where of suitable quality, published in English. A reviewer assessed the full text of each article and extracted the information applicable to the clinical question. For the development of this guidance SDCEP used the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach to assess and rate the quality of evidence (www.gradeworkinggroup.org). For guidelines, the AGREE II instrument was used, in addition to GRADE, to assess the methodological quality of the retrieved articles (www.agreetrust.org). The AGREE II instrument is a simple and validated assessment tool that provides an overall quality score for each guideline and an indication of how reliable recommendations from that guideline might be.

The synthesised evidence for a given clinical question was summarised and distributed to members of the GDG prior to meetings of the group to inform and facilitate the development of the recommendations for the guidance. Where authoritative evidence was unavailable, the GDG was asked to make recommendations based on current best practice and expert opinion, reached by consensus. The process for development of recommendations also followed the GRADE approach, with considered judgements based on the quality of evidence, the balance of risks and benefits, the values and preferences of the patients, and the limitations and inconveniences of the treatment. The relative importance of each of these criteria for a given recommendation was decided by the GDG. The guidance text to communicate the recommendations was drafted by the SDCEP Programme Development Team, with input from the GDG.

A four week consultation process on the present draft of the guidance was initiated on February 9th 2015. The consultation draft was made available through the SDCEP website and notification of this has been sent to a wide range of individuals and organisations with a particular interest in this topic. To obtain feedback from the end-users of the guidance, a small number of dentists have been contacted directly to evaluate the guidance, and all dentists, dental therapists and dental hygienists in Scotland notified that the consultation draft is available for comment. All comments received through the consultation process will be considered carefully and the guidance amended accordingly prior to publication.
A review of the context of this guidance (e.g. regulations, legislation, trends in working practices, evidence) will take place three years after publication and, if this has changed significantly, the guidance will be updated accordingly.

Further information about SDCEP and guidance development is available at www.sdcep.org.

**Steering Group**

The Steering Group oversees all the activities of the SDCEP and includes representatives of guidance development groups and the dental institutions in Scotland. For up-to-date membership of the Steering Group, refer to the SDCEP website (www.sdcep.org.uk).

**Conflict of Interest**

All contributors to SDCEP are required to declare their financial, intellectual and other relevant interests. At each group meeting, participants are asked to confirm whether there are any changes to these. Should any potential conflicts of interest arise, these are discussed and actions for their management agreed. All declarations of interest and decisions about potential conflicts of interest are available on request.
Appendix 2. Anticoagulants and antiplatelet drugs available in the UK

<table>
<thead>
<tr>
<th>Oral Anticoagulants</th>
<th>b UK Trade name(s)</th>
<th>Other names (non-UK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>warfarin</td>
<td>Marevan</td>
<td>Coumadin, Jantoven, Uniwarfin, Aldocumar (There are another 10-20 other trade names used)</td>
</tr>
<tr>
<td>phenindione</td>
<td>Dindevan</td>
<td>Phenyline, Pindione</td>
</tr>
<tr>
<td>acenocoumarol</td>
<td>Sinthrome</td>
<td>Sintrom, Sinkumar, Syncumar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oral Antiplatelets</th>
<th>UK Trade name(s)</th>
<th>Other names (non-UK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>aspirin (acetylsalicylic acid, ASA)</td>
<td>Nu-Seals, Microprin, caprin Dual with dipyridamole: Asasantin Retard, Molita Modified Release</td>
<td>There are numerous brand names for aspirin</td>
</tr>
<tr>
<td>clopidogrel</td>
<td>Plavix, Grepid</td>
<td>Iscover</td>
</tr>
<tr>
<td>dipyridamole</td>
<td>Persantin, Persantin Retard, Attia Modified Release, Ofcram PR. Dual with aspirin: Asasantin Retard, Molita Modified Release</td>
<td></td>
</tr>
<tr>
<td>prasugrel</td>
<td>Efient</td>
<td>Effient, Prasita</td>
</tr>
<tr>
<td>ticagrelor</td>
<td>Brilique</td>
<td>Brilinta, Possia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOACs</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>apixaban</td>
<td>Eliquis</td>
<td></td>
</tr>
<tr>
<td>dabigatran</td>
<td>Pradaxa</td>
<td>Pradax, Prazaxa</td>
</tr>
<tr>
<td>rivaroxaban</td>
<td>Xarelto</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Injectable Anticoagulants</th>
<th>b UK Trade name(s)</th>
<th>Other names (non-UK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>dalteparin</td>
<td>Fragmin</td>
<td>Fragmine, Dalpin, Daltehep</td>
</tr>
<tr>
<td>enoxaparin</td>
<td>Clexane</td>
<td>Lovenox, Xaparin, Klexane</td>
</tr>
<tr>
<td>tinzaparin</td>
<td>Innohep</td>
<td>Logiparin</td>
</tr>
</tbody>
</table>

*These are currently the most commonly prescribed anticoagulants and antiplatelet drugs
*www.medicines.org.uk/ Accessed 4th December 2014
Appendix 3. Indications for anticoagulation or antiplatelet therapy

<table>
<thead>
<tr>
<th>Medical condition</th>
<th>Commonly used treatmenta</th>
<th>Treatment duration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke or transient ischaemic attack (TIA) in the absence of atrial fibrillation (AF)</td>
<td>Single or dual antiplatelets</td>
<td>Lifelong</td>
<td>Occasionally warfarin</td>
</tr>
<tr>
<td>Stroke prevention in patients with Atrial fibrillation (AF)</td>
<td>Warfarin (other VKAs rarely) or a NOAC</td>
<td>Lifelong</td>
<td>Occasionally single or dual antiplatelets</td>
</tr>
<tr>
<td>Thromboembolic disease including, but not limited to Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE)</td>
<td>Warfarin, NOAC or injectable anticoagulant</td>
<td>Treatment usually 6 weeks to 6 months Prophylaxis can be lifelong Can be lifelong if there is recurrence or an ongoing untreatable risk factor (e.g. malignancy)</td>
<td></td>
</tr>
<tr>
<td>Recent significant surgery</td>
<td>Injectable anticoagulant or NOAC</td>
<td>Usually 2-6 weeks</td>
<td>Occasionally warfarin</td>
</tr>
<tr>
<td>Any heart surgery, but especially prosthetic replacement heart valve</td>
<td>Warfarin (or other VKA) or single antiplatelet</td>
<td>Long term</td>
<td>Warfarin or similar for mechanical valves, aspirin for tissue valves</td>
</tr>
<tr>
<td>Coronary Heart Disease: Stable Angina Unstable Angina Heart Attack (STEMI and Non-STEMI)</td>
<td>Single antiplatelet, dual antiplatelet, warfarin, warfarin with single antiplatelet or injectable anticoagulant</td>
<td>Dual therapy for up to 12 months, single aspirin, warfarin or clopidogrel lifelong</td>
<td></td>
</tr>
<tr>
<td>Kidney dialysis</td>
<td>Heparin or injectable anticoagulants</td>
<td>On day of dialysis</td>
<td></td>
</tr>
<tr>
<td>Pregnancy with associated risk factors for venous thromboembolism VTE</td>
<td>Aspirin (or injectable anticoagulants in some high risk cases)</td>
<td>Until delivery</td>
<td>Risks include obesity</td>
</tr>
<tr>
<td>Treatment of DVT in pregnancy</td>
<td>Injectable anticoagulant</td>
<td>Until at least 6 weeks after delivery</td>
<td></td>
</tr>
<tr>
<td>Peripheral Vascular Disease (PVD)/Peripheral Arterial Disease (PAD)</td>
<td>Single or dual antiplatelets</td>
<td>Lifelong</td>
<td></td>
</tr>
<tr>
<td>Apical/ventricular/mural thrombus</td>
<td>Warfarin</td>
<td>6 months (reviewed after echocardiography) Often in combination with dual antiplatelet therapy if recent heart attack</td>
<td></td>
</tr>
</tbody>
</table>

aFurther combinations are possible if the patient has multiple indications
bSTEMI: ST segment elevation myocardial infarction

Notes:
The list is not comprehensive and is intended as a guide to reflect the current use of these drugs in the UK population.
The option of delaying dental procedures should be considered where the duration of drug treatment is time limited.
Appendix 4. Drug interactions

Appendix 4 includes a table of possible interactions and effects between anticoagulant or antiplatelet medications and drugs commonly prescribed by dentists. This has been compiled from information contained in the current BNF\textsuperscript{16}, the individual drug SPCs\textsuperscript{31} and with expert advice. Drugs which are likely to increase the anticoagulant or antiplatelet effect of the existing medication, and therefore have the potential to increase bleeding risk, are indicated in red. Those which may decrease the anticoagulant or antiplatelet effect of the existing medication, and therefore have the potential to increase the patient’s thromboembolic risk, are indicated in blue.

<table>
<thead>
<tr>
<th>Drug Interactions (and possible effects)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oral Anticoagulants</strong></td>
</tr>
<tr>
<td>warfarin</td>
</tr>
<tr>
<td>Penicillins including co-amoxiclav (anecdotal reports of increased INR with amoxicillin)</td>
</tr>
<tr>
<td>pheninedione</td>
</tr>
<tr>
<td>Metronidazole, erythromycin, clarithromycin (anticoagulant effect enhanced in a minority of patients)</td>
</tr>
<tr>
<td>acenocoumarol</td>
</tr>
<tr>
<td>NSAI DS, aspirin, ibuprofen, diclofenac (may increase bleeding risk)</td>
</tr>
<tr>
<td>Carbamazepine (reduced anticoagulant effect)</td>
</tr>
<tr>
<td>Miconazole, fluconazole (established and clinically important increase in anticoagulation effect)</td>
</tr>
<tr>
<td><strong>Oral Antiplatelets</strong></td>
</tr>
<tr>
<td>aspirin</td>
</tr>
<tr>
<td>NSAI DS, ibuprofen, diclofenac (antiplatelet effect of aspirin may be reduced by ibuprofen when used regularly)</td>
</tr>
<tr>
<td>clopidogrel</td>
</tr>
<tr>
<td>NSAI DS, aspirin, ibuprofen, diclofenac (may increase bleeding risk)</td>
</tr>
<tr>
<td>Erythromycin (may reduce antiplatelet effect)</td>
</tr>
<tr>
<td>Carbamazepine (may reduce antiplatelet effect)</td>
</tr>
<tr>
<td>Fluconazole (may reduce antiplatelet effect)</td>
</tr>
<tr>
<td>Omeprazole (may reduce antiplatelet effect)</td>
</tr>
<tr>
<td>dipyridamole</td>
</tr>
<tr>
<td>Aspirin (may increase bleeding risk)</td>
</tr>
<tr>
<td>prasugrel</td>
</tr>
<tr>
<td>NSAI DS, aspirin, ibuprofen, diclofenac (may increase bleeding risk)</td>
</tr>
<tr>
<td>ticagrelor</td>
</tr>
<tr>
<td>NSAI DS, aspirin, ibuprofen, diclofenac (may increase bleeding risk)</td>
</tr>
<tr>
<td>Clarithromycin (plasma concentration of ticagrelor may be increased)</td>
</tr>
<tr>
<td>Carbamazepine (plasma concentration of ticagrelor may be reduced)</td>
</tr>
</tbody>
</table>
### NOACs

<table>
<thead>
<tr>
<th>NOAC</th>
<th>NSAIDs; aspirin, ibuprofen, diclofenac (may increase bleeding risk)</th>
<th>Carbamazepine (plasma concentration of NOAC may be reduced)</th>
</tr>
</thead>
<tbody>
<tr>
<td>apixaban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dabigatran</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rivaroxaban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dalteparin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>enoxaparin</td>
<td>NSAI DS; aspirin, ibuprofen, diclofenac (may increase bleeding risk)</td>
<td></td>
</tr>
<tr>
<td>tinzaparin</td>
<td>NSAI DS; aspirin, ibuprofen, diclofenac (may increase bleeding risk)</td>
<td></td>
</tr>
</tbody>
</table>

Fever or infection can affect coagulation or drug metabolism therefore any patient systemically unwell enough to require an antibacterial may have an altered coagulation status.

The use of NSAIDs is discouraged in patients with vascular disease, because of their antiplatelet action. Simple analgesics (paracetamol, co-codamol) should be tried first. If an NSAID is required, treatment length should be kept to a minimum.

For further information refer to the current version of the BNF and SDCEP Drug Prescribing in Dentistry guidance.  

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### Appendix 5. Patient Information Leaflet

#### Anticoagulants and Antiplatelet Drugs and Your Dental Treatment

**Information for Patients**

This leaflet contains information about:

- How your medication may affect your dental treatment.
- What you should do to tell your dentist about your medication before dental treatment.
- How your dentist will make sure that your treatment is suitable for you.
- What to do if you have any concerns after your treatment.

#### Anticoagulants and Antiplatelet Drugs

The anticoagulant or antiplatelet medication that you are taking helps to prevent harmful blood clots from forming in your blood vessels. Because these drugs work by slowing down the formation of blood clots, they can also make you bleed more easily and for longer, especially if you are having treatment which would normally cause bleeding, such as some dental procedures.

There are many different anticoagulant and antiplatelet drugs. The most commonly prescribed are:

- Warfarin (also known as Marevan)
- Aspirin
- Clopidogrel (also known as Plavix or Gresep)

You may have been prescribed one of the newer anticoagulant drugs:

- dabigatran (also known as Pradaxa)
- apixaban (also known as Eliquis)
- rivaroxaban (also known as Xarelto)

You may have been prescribed more than one antiplatelet or anticoagulant medication.

#### Your oral health

It is important for everyone to maintain their oral hygiene and you should continue to clean your teeth as usual. By taking care of your oral health you can reduce the need for dental treatment that might cause bleeding.

You can still go to your dentist and hygienist as usual when you are taking anticoagulants or antiplatelet drugs.

#### What to do before your dental treatment

Before you have any dental treatment it is very important that you inform the dentist (dentist, dental hygienist or dental therapist) that you are taking an anticoagulant or antiplatelet drug.

Tell the dentist that you are taking an anticoagulant or antiplatelet drug, and which of those drugs (if any) you are taking:

- If you have an alert card for your medication, show that to your dentist.
- If you are taking warfarin, phenindione oracenocoumarol, show the dentist your INR testing record.

Tell the dentist about any other medications you are taking, including ones that are non-prescribed, particularly aspirin or other non-steroidal anti-inflammatory drugs (NSAIDS) such as ibuprofen and diclofenac.

- These medications can cause you to bleed more.
- It would be helpful to show the dentist all of your prescriptions.

Tell the dentist about any medical conditions that you have, particularly if you have a kidney or liver condition.

- These conditions can cause you to bleed more.

This information will allow the dentist to decide on the most suitable treatment for you. Your dentist may contact your doctor if he/she requires more information.

In most cases your dental treatment will be carried out as normal, although your dentist may carry out the treatment in stages or take other precautions.

For certain drugs (particularly dabigatran, apixaban or rivaroxaban) your dentist may ask you to miss one or more doses of your medication before you have your dental treatment.

You should not alter your medication unless instructed to do so by your doctor or dentist.

#### What to do after your dental treatment

After having dental treatment that causes bleeding, such as a tooth extraction, you should follow these post-treatment instructions:

- Rest while the local anaesthetic wears off and the clot fully forms (usually 2-3 hours).
- Avoid rinsing until the next day.
- Avoid sucking hard or disturbing the clot with your tongue or anything else.
- Avoid hot liquids and hard foods for the rest of the day and avoid chewing on the affected side of your mouth.

Starting the day after treatment, partly rinse your mouth with warm salty water 3-4 times a day for 5 days (a teaspoon of salt in a glass of water).

If you require painkillers and can take paracetamol, use it as advised on the pack and never taking more than the recommended dose. Avoid NSAIDS such as aspirin, ibuprofen or diclofenac, or medicines containing these. Contact your doctor for advice if you are unable to take paracetamol or paracetamol is not enough to manage the pain.

If the bleeding continues or restarts after you have left the dental surgery, apply pressure to the bleeding area for 30 minutes, for example by biting down on a folded, clean, damp handkerchief or paper pad. If this does not control the bleeding contact your dentist. He/she may advise you to return to the dental surgery for further treatment to stop the bleeding.

If you are unable to contact your dentist, and you are concerned about the bleeding, contact one of the emergency care providers listed below. You must tell them that you are taking an anticoagulant or antiplatelet drug.

**Emergency Contact Details**

- Dental surgery phone no:
- Dental surgery out-of-hours phone no:
- NHS 24 phone no:

Appendix 6. Advice for prescribers and dispensers of anticoagulants and antiplatelet drugs

Anticoagulants and Antiplatelet Drugs – Patients Requiring Dental Treatment:
Information for Prescribers and Dispensers

You will be aware that patients taking anticoagulants or antiplatelet drugs are at a higher risk of bleeding complications following invasive procedures, including some dental treatments.

The patient should be made aware of the importance of informing their dentist of their medication.

Advise the patient that:

- The medication they have just been given is an anticoagulant or antiplatelet drug and that it is associated with a very small risk of excessive or prolonged bleeding following invasive procedures.

- They must tell their dentist that they are taking an anticoagulant or antiplatelet drug, which one(s) they are taking and for how long, or present their anticoagulant alert card to the dentist, before treatment.

- If they are taking warfarin, or another vitamin K antagonist, they should take their INR testing records every time they attend for dental treatment.

For further information please refer to guidance on the ‘Management of Patients who are taking Anticoagulants or Antiplatelet Drugs and require Dental Treatment’ developed by the Scottish Dental Clinical Effectiveness Programme (www.sdcep.org). This guidance advises dental practitioners to consult with a patient’s prescriber, in certain circumstances.
A patient information leaflet is available for download from the SDCEP website.
Appendix 7. Local contacts for advice and referral

Note here the details of any healthcare providers that you might need to contact, for information, advice or emergencies, for example:

- Other primary care dental practices/colleagues
- Secondary care specialists in oral surgery, oral and maxillofacial surgery and oral medicine
- Local general medical practices
- Local source of pharmacy advice
- Hospital haematology department
- Hospital cardiology department

<table>
<thead>
<tr>
<th>Provider</th>
<th>Contact details</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS24</td>
<td>Tel: 111</td>
</tr>
</tbody>
</table>

For further information concerning a patient’s medical condition or their medication, consult with the patient’s general medical practitioner, cardiologist or other medical specialist, in order to assess their bleeding risk and to inform treatment planning. The local haematology department, hospital or community pharmacist should also be able to provide answers to general queries about patients taking anticoagulants or antiplatelet drugs.

Colleagues in primary or secondary dental care should be consulted for advice on treatment, if required. Where possible, the secondary dental care specialist should be consulted prior to referring a patient to discuss whether the patient could be treated safely in primary care or whether they should be referred.

When referring a patient, details of the patient’s anticoagulation medication should be included in the referral.
## Managing a patient taking anticoagulants or antiplatelet drugs

<table>
<thead>
<tr>
<th>Question</th>
<th>No</th>
<th>Yes</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is dental treatment likely to cause bleeding?</td>
<td></td>
<td></td>
<td>Treat with caution using standard procedures.</td>
</tr>
<tr>
<td>Is medication life-long?</td>
<td></td>
<td></td>
<td>Delay dental treatment where possible.</td>
</tr>
<tr>
<td>Does the patient have other relevant medical complications?</td>
<td></td>
<td>Yes</td>
<td>Consult with GP or specialist, if required, or seek dental advice.</td>
</tr>
<tr>
<td>Is the patient taking an anticoagulant?</td>
<td></td>
<td>No</td>
<td>Antiplatelets: Aspirin</td>
</tr>
<tr>
<td>Is the patient taking an oral anticoagulant?</td>
<td></td>
<td></td>
<td>Antiplatelets: Clopidogrel alone or clopidogrel, dipyridamole, prasugrel or ticagrelor in combination with aspirin</td>
</tr>
<tr>
<td>Is the patient taking an oral anticoagulant?</td>
<td></td>
<td>No</td>
<td>Injectable anticoagulants: Dalteparin, enoxaparin or tinzaparin</td>
</tr>
<tr>
<td>Is the patient taking warfarin or another VKA?</td>
<td></td>
<td>Yes</td>
<td>Vitamin K antagonists: Warfarin, acenocoumarol or phenindione</td>
</tr>
<tr>
<td>Is the patient taking a NOAC?</td>
<td></td>
<td>No</td>
<td>NOACs: Dabigatran, apixaban or rivaroxaban</td>
</tr>
<tr>
<td>Is the patient taking a drug or combination not already mentioned?</td>
<td></td>
<td></td>
<td>Consult with GP or specialist for more information.</td>
</tr>
</tbody>
</table>

### For all patients requiring dental treatment likely to cause bleeding:
Where possible plan treatment for early in the day and week, only treat where there is adequate access to emergency care, treat atraumatically and provide patients with written post-treatment advice and emergency contact details.

### Treat without interrupting medication:
Consider limiting initial treatment area and staging extensive or complex procedures; use local haemostatic measures (packing, suturing).

#### Treat without interrupting medication:
Expect prolonged bleeding, limit initial treatment area and assess the need to stage extensive or complex procedures; use local haemostatic measures (packing, suturing).

Check INR, no more than 72hr before procedure (24hr if patient is not stably anticoagulated)
If INR <= 4 treat without interrupting medication: Consider limiting initial treatment area and staging extensive or complex procedures; use local haemostatic measures (packing, suturing).
If INR > 4 inform and consult with general medical practitioner or anticoagulation service and reschedule treatment or refer if urgent.

For dental procedures with a low bleeding risk: Treat without interrupting medication.

For dental procedures with a higher bleeding risk:
Advis patient to miss morning dose on day of treatment; for twice a day medication restart at usual evening dose; for once a day medication take missed dose after minimum of 4 hours if haemostasis achieved.

Treat, with caution: limit initial treatment area and assess bleeding before continuing; stage extensive or complex procedures; perform local haemostatic measures and suture routinely.
References


