

An anticoagulant is something that prevents the blood from clotting, or coagulating. Anticoagulants can be found in nature¹ but are also widely used in medicine. Sometimes anticoagulants are referred to as *blood thinners*. People are prescribed anticoagulant medication in a variety of situations where the clotting of their blood is likely to cause problems in the heart, the brain, or elsewhere in their body.

Antiplatelet medications also prevent clotting but do so via a different mechanism to anti-coagulants. As the title implies antiplatelet agents act directly against the clotting-related functions of the platelets rather than the other clotting pathways.

CAUTION

This Medical Information Sheet contains general advice concerning the CAA's regulatory handling of medical conditions. This sheet is not intended as clinical medical advice and should not ever be used as the basis of decisions concerning your medical care. You should consult your medical advisers and discuss your options thoroughly with them before making any decisions about your medical care.

While there are many reasons for the medical use of anticoagulant and antiplatelet medications the situations most often seen by the CAA are: Prevention of Deep Vein Thrombosis (DVT) and / or Pulmonary Embolism in susceptible individuals; Prevention of complications after heart surgery; and the prevention of embolism and stroke in people with Atrial Fibrillation. This Medical Information Sheet outlines the CAA's approach to those medications, mainly the anticoagulants *warfarin* and *dabigatran*, in the context of aviation safety.

What do anticoagulants do?

Our blood has a number of mechanisms that cause it to clot in certain circumstances. When the blood's clotting systems are working well the formation of a blood clot is something that is beneficial, such as when you get a cut and the clot helps prevent excessive bleeding. Some people, however, have abnormalities of their clotting systems and are much more likely to form clots, resulting in DVTs or clots in the blood stream (emboli) causing damage to other parts of the body (e.g. the brain). Other people have medical problems that interfere with their, otherwise normal, clotting systems. Problems with the heart, such as heart surgery, abnormal (or prosthetic) heart valves, and abnormal heart rhythms are relatively common causes of small clots forming while bed rest and cancers can cause larger DVTs.

Anticoagulant medications are used to interfere with the clotting of the blood and so reduce the likelihood of large or small blood clot formation. Like so many other medications anticoagulants can be associated with other risks, most notably an increased likelihood of bleeding problems. This means that it is often important that anticoagulant treatment be kept in a fairly tight range. Too much anticoagulant effect and there is the risk of bleeding problems, and too little effect results in the risk of dangerous blood clot formation.

What do antiplatelet medications do?

Platelets, sometimes called thrombocytes, are tiny blood cells that help the other coagulation mechanisms in stopping bleeding. Platelets often act early to *plug the hole* when a cut, or other trauma, disrupts blood vessels and

¹ Mosquitoes and leeches, for example, inject anticoagulants to make it easier to consume their prey's blood.

leads to bleeding. Platelets are also involved in other complex relations and reactions with the other coagulation mechanisms.

Normal platelets can form clots inappropriately, such as sometimes when thrombus forms inside blood vessels or when heart valves are damaged. Abnormal platelet function can lead to increased clot formation or increased bleeding, depending on the nature of the abnormality.

Is it ok to fly while taking anticoagulant or antiplatelet medication?

Sometimes! All anticoagulants and antiplatelet medications have risks associated with their use, and the underlying medical condition that requires them is generally also of aeromedical significance. Despite those risks there are many situations where anticoagulant use is considered to be adequately safe, for private and professional aviation activities.

In some cases, such as after stenting surgery to the heart, the risks of the underlying condition are the main consideration, and a stand-down period is utilised (see MIS 008²). In other cases, such as the treatment of recurrent DVT, a fine balance must be maintained with the anticoagulant effect stable and within the therapeutic range. In still other cases some newer oral anticoagulant drugs help make medical management easier and may not result in an unacceptable overall medical risk.

The difficulty — for aviation personnel, their health care professionals, and regulatory authorities — is that no two cases are identical and so the individual medical circumstances of each applicant / certificate holder must be considered.

Which anticoagulant or antiplatelet medications are ok and not ok?

The aeromedical risks associated with anticoagulant medication can never be considered in isolation. The underlying medical condition, and its risks, must also be considered.

All the same, there are some situations where anticoagulant usage is acceptable for aviation purposes. These include:

- Aspirin³ use is usually acceptable. However sometimes aspirin is inadequate for reducing the risk of the underlying medical condition, and sometimes the risk of the condition itself is unacceptably high.
- Warfarin use may be acceptable, providing it is stably and reliably within the therapeutic range. Often, however, the risks associated with the underlying medical condition are unacceptable.
- Dabigatran use may be acceptable. This is a new oral anticoagulant medication which appears to have a risk profile at least equivalent to warfarin, without the need for such careful monitoring of the therapeutic range.
- Other new oral anticoagulant agents. Generally, not acceptable, although future trial results may modify that stance.
- Heparin. Generally, not acceptable. Risk associated with underlying medical condition is also likely to be unacceptable.

My doctor wants to start me on an anticoagulant. What should I do?

The decision concerning anticoagulation is one for you to make, in discussion with your health care providers. It is important that you tell your doctor that you're a pilot or air traffic controller so they can tailor their medical advice to your condition and your aviation activities.

² <https://www.aviation.govt.nz/assets/publications/medical-information-sheets/mis008-after-a-heart-attack-or-coronary-artery-stents.pdf>

³ Aspirin does prevent clotting but is technically referred to as an anti-platelet agent rather than an anti-coagulant.

If your doctor needs more information about the aviation implications of your planned anticoagulation, then they will be welcome to discuss the matter with your CAA Medical Examiner or the Medical Staff at CAA.

If you have a medical condition that results in your doctor wanting to start you on anticoagulant medication you will need to report that to the CAA, either directly or via your Medical Examiner. Your doctor also has an obligation to advise the CAA (see MIS 002⁴ and 003⁵).

What will the CAA do?

The CAA's response to your anticoagulation will depend on the overall medical circumstances of your case. It is likely that suspension / disqualification action will be taken initially. In taking that action the CAA will request further information as your medical management continues.

The main things that the CAA will be looking for are:

- Confirmation that the underlying problem has resolved or is adequately and reliably under control or in remission;
- Confirmation that the anticoagulant usage is, in itself, adequately safe; and
- Confidence that that particular anticoagulant can be relied upon to remain safe.

Once these things have been determined, and assuming everything else is ok, it is likely that a medical certificate will be returned—often subject to ongoing surveillance and monitoring conditions, and sometimes (especially professional pilots) subject to 'multicrew' restrictions.

Will I be grounded if I am treated with an anticoagulant medication?

Initially suspension / disqualification is most likely. In the majority of cases, once everything is sorted out, medical certification resumes. In some rare cases either the nature of the underlying condition or the risks associated with the anticoagulation itself preclude further medical certification.

But my doctor says I'm fine

Unfortunately, it is not unusual for a treating medical practitioner to believe their patient is 'fine' and 'doing well' while a regulatory medical practitioner may not be willing to issue a medical certificate. This does not mean that those two doctors necessarily disagree, although it is possible that they do, but is usually an indication that they are viewing the same information from a different perspective.

The treating medical practitioner has a primary responsibility towards the health of their patient, while the regulatory practitioner has public safety as their main responsibility. So somebody's medical situation may, quite correctly, be seen as being very good by the treating doctor but not (yet) safe enough for certification by the regulatory doctors.

What if I don't agree with a CAA decision concerning my anticoagulation?

You are always able to seek review of eligible CAA medical certification decisions. For further information on review / appeal options you may wish to consult MIS 005 'What Are My Review Options?'⁶ or the medical section of the CAA website.

Medical Information Sheets can be downloaded from:

<https://www.aviation.govt.nz/licensing-and-certification/medical-certification/medical-information-sheets/>

⁴ <https://www.aviation.govt.nz/assets/publications/medical-information-sheets/mis002-medical-practitioner-obligations.pdf>

⁵ <https://www.aviation.govt.nz/assets/publications/medical-information-sheets/mis003-your-doctor-must-advise-the-cao.pdf>

⁶ <https://www.aviation.govt.nz/assets/publications/medical-information-sheets/mis005-what-are-my-review-options.pdf>

Looking at the law

Civil Aviation Rule Part 67: Medical Standards

Rules 67.103(b)(3) (Class 1), 67.105(b)(3) (Class 2), and 67.107(b)(3) (Class 3) contain the main medical standard that relates directly to medications such as the various anticoagulants. An earlier rule (67.103(b)(1), 67.105(b)(1), and 67.107(b)(1) respectively) provides a more general requirement that also applies to the use of medications.

Many of the medical standards include a reference to the term “aeromedical significance” which is expanded further in Rule 67.3(a): “A medical condition is of aeromedical significance if, having regard to any relevant general direction, it interferes or is likely to interfere with the safe exercise of the privileges or the safe performance of the duties to which the relevant medical certificate relates”.

In the class 1 medical standards rule 67.103(b)(3) requires that an applicant not be –

- taking any drug, medication, substance, or preparation nor undergoing any treatment; or
- experiencing any side-effect from any drug, medication, substance, preparation or treatment -

That, having regard to any relevant general direction, interferes or is likely to interfere with the safe exercise of the privileges or the safe performance of the duties to which a class 1 medical certificate relates.

The general class 1 provisions, rule 67.103(b)(1), also requires an applicant to –

- have no medical condition that is of aeromedical significance.

There are other medical standards, also contained in Rule Part 67, that relate more directly to the underlying condition that necessitates the use of anticoagulants but it is beyond the scope of this document to list all of them.

Aviation Medicine Team

Tel: +64-4-560 9466

Email: med@caa.govt.nz

Website: www.aviation.govt.nz

P O Box 3555, Wellington, 6140, New Zealand