

## Heparin

This factsheet provides information for people with atrial fibrillation (AF) who have been advised that they will be given the anticoagulant heparin during a forthcoming procedure.

Heparin is an injectable anticoagulant used in hospitals and other clinical environments to rapidly 'thin' the blood. It provides protection from AF-related blood clots which may cause a stroke, but has uses in other clinical situations as well such as pulmonary embolism, valvular heart disease and deep vein thrombosis. It has a rapid onset of action combined with a shorter half-life compared to warfarin. For this reason, it is often used so that perioperative patients, including those who may have been asked to discontinue their normal oral anticoagulant, spend as little time as possible unprotected from clot formation.

Heparin does not break down clots that have already formed but it prevents them from developing further and significantly reduces the risk of new blood clots forming. It is destroyed during the digestion process which is why it cannot be taken orally and needs to be injected either subcutaneously (into the skin) or intravenously (directly into a vein). Its short half-life means that it must be given frequently, and so it is not a viable long-term option.

Heparin is very useful and versatile in a medical environment because it starts working straight away. Because of its short half-life, the dose can be fine-tuned according to specific circumstances. There are two kinds of heparin used to anticoagulate a patient: unfractionated heparin (UFH), and low-molecular-weight heparin (LMWH).

### Unfractionated heparin (UFH)

UFH has been used for the prevention and treatment of thrombosis for several decades. It has a very short half-life of about one hour, so it

can be given as needed in a clinical environment, such as during operations, in the form of an intravenous infusion. There is an antidote (protamine) for it, so it can readily be reversed when needed. It requires regular monitoring of blood levels because its effect varies depending on dose and circumstances.

### Low-molecular-weight heparin (LMWH)

LMWHs are derived from UFH but have different anticoagulant activity. The half-life is about four times longer than for UFH so is often given twice a day rather than as a continuous infusion. It has a predictable dose response. Because of several clinical advantages and ease of administration, LMWHs have gradually replaced UFH for most applications. Currently there is no antidote for it, but a bleed would be short lived because of the short half-life.

LMWH treatment may continue until oral anticoagulation is established or the patient's INR is within target range if they were taking warfarin.

LMWH should not be used to prevent AF-related stroke, or treat patients who have had an AF-related stroke, before anticoagulation is initiated. This is because it is associated with an increased risk of bleeding but little benefit in the treatment of the patient. Also, LMWH should not be routinely used to 'bridge' patients who are having operative procedures and need to stop their anticoagulants. Only very high risk patients need this (e.g. patients with metallic artificial heart valves) and for most patients having an operation it is more appropriate for the anticoagulant tablet to be stopped and then simply restarted after the procedure.

### Before a procedure

Patients, should be guided by their clinicians as to if, and when, to stop their usual oral anticoagulant and, if heparin is required, to provide



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anticoagulant cover before, during, and after their procedure, and in what form it should be given. Sometimes, those already on anticoagulation may be asked to discontinue this temporarily for a few days before an invasive procedure, surgery, an exploratory investigation like a colonoscopy, or a catheter ablation. For people on warfarin, their international normalized ration (INR) will typically drop from 2.5 to about 1.5 after about three days. However, many centers perform cardiac catheter ablations with patients continuing to take their warfarin.

If the investigation reveals intestinal bleeding problems, this may affect the patient's future anticoagulation regime, and the clinician will advise the patient how this will be dealt with in the future.

### Are there special precautions to follow if you are to be given heparin?

- It is very important that you obtain clear instructions for taking or discontinuing your usual anticoagulant. Make sure that you understand all your medication instructions.
- Avoid heavy or variable alcohol use. A sudden increase in alcohol intake can increase your risk of bleeding.
- Attend all your follow-up appointments.

### Questions to ask your clinician before being given heparin

- Do you have a list of all the medications I am taking?
- Why is it necessary for me to be given heparin?
- I am not on anticoagulation but on the dual antiplatelet therapy of clopidogrel with aspirin. Is heparin appropriate for me?
- Are there things I should avoid eating or doing beforehand?

- Will it just be used on the day of the procedure?
- What kind of heparin will you be using?
- How many doses will I need?
- What is the risk of bleed compared to my normal anticoagulant?
- What are the side effects?
- How will it affect my INR?
- When should I start taking my usual anticoagulant again?

For further information please see the AF Association Preventing AF-related stroke: anticoagulation booklet.

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