

## FURTHER READING

See resources on the following web sites:

US Centers for Disease Control and Prevention [www.cdc.gov/travel](http://www.cdc.gov/travel)

World Health Organization [www.who.int/ith/](http://www.who.int/ith/)

Health Canada [www.travelhealth.gc.ca](http://www.travelhealth.gc.ca)

Department of Public Health and Travel Medicine, James Cook University  
[www.jcu.edu.au/school/phtm/PHTM/putravel.htm](http://www.jcu.edu.au/school/phtm/PHTM/putravel.htm)

*Conflict of interest: none declared*

## Self-test questions

*The following statements are either true or false (answers on page 75)*

7. Doxycycline is unsuitable for malaria chemoprophylaxis in pregnant women.
8. Mefloquine should not be used for self-treatment by someone who has been taking it for malaria chemoprophylaxis.

## Dental notes

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### Managing dental patients receiving warfarin therapy

Warfarin is an anticoagulant which inhibits synthesis of the vitamin K-dependent coagulation factors II, VII, IX and X. Indications for anticoagulation are increasing, and dentists will be consulted by patients taking warfarin.

The activity of warfarin is expressed using the international normalised ratio (INR).<sup>1</sup> A normal coagulation profile has an INR of 1.0. The desirable INR range for patients depends on the condition being treated. Patients receiving treatment for deep vein thrombosis have a lower target range than those with prosthetic heart valves.<sup>2</sup> The risk of bleeding increases exponentially as the INR rises. Gingival bleeding can indicate a raised INR. Oral surgery can be completed safely with an INR from 1.5 to 2.5.<sup>3</sup> A small study has suggested that with appropriate local measures to reduce bleeding, teeth may be removed by simple extraction with an INR of 2–4.<sup>4</sup> However dentists should still be cautious before they remove teeth where the INR exceeds 3.

The possibility of postoperative bleeding in patients taking warfarin concerns dentists. However, before deciding if warfarin therapy should be interrupted the risk of perioperative or postoperative bleeding must be balanced against the risk of thromboembolism.<sup>2</sup>

Before dental treatment a thorough medical history should be obtained including details of any condition likely to be treated with warfarin. The dentist should also consider possible drug interactions with warfarin.<sup>5</sup> Medications including antibiotics such as metronidazole, herbal remedies and alcohol may unpredictably alter the INR. If an interaction is considered likely or if the effect of any prescribed medication is not known, the dentist should consult the doctor supervising the patient's anticoagulant therapy. The INR should be checked before surgery.

For routine conservative dental treatment including scaling, changing an established warfarin regimen is not justified.<sup>6</sup> In

most cases of dento-alveolar/oral surgery, including simple extraction of teeth, bleeding can be controlled in a reasonable time by minimising the extent of surgery to one site or quadrant, and using firm sutures or firm postoperative packs over the wound. Preferably surgery should be performed in the morning to facilitate postoperative observation. For extensive surgery the assistance of the physician supervising coagulation therapy is required to assist in determining whether a change of coagulation therapy is indicated.

Where the operative site is infected the use of antibiotics should be restricted to a preoperative prophylactic dose and postoperative antibiotics should be discontinued as soon as reasonable. Prolonged use of broad spectrum antibiotics should be avoided as it may change the effectiveness of warfarin by altering gut microflora compromising availability of vitamin K. Aspirin and non-steroidal anti-inflammatory drugs may also increase the risk of bleeding.

Local anaesthetics should be given cautiously avoiding venepuncture. To avoid the needles becoming barbed and tearing tissues, they should be used once only for each mucosal or skin puncture. Local vasoconstriction may be encouraged by infiltrating a small amount of local anaesthetic solution with 1:100 000 or 1:200 000 adrenaline close to the surgery site.

## REFERENCES

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4. Devani P, Lavery KM, Howell CJ. Dental extractions in patients on warfarin: is alteration of anticoagulant regime necessary? *Br J Oral Maxillofac Surg* 1998;36:107-11.
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6. Wahl MJ. Myths of dental surgery in patients receiving anticoagulant therapy. *J Am Dent Assoc* 2000;131:77-81.