

FIVE THINGS TO KNOW ABOUT ...

Emergency reversal of warfarin anticoagulation

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Previously published at www.cmaj.ca**Emergency reversal of warfarin anticoagulation is required when a patient has major bleeding or needs an urgent procedure**

Blood products, such as prothrombin complex concentrate, should be used only when the international normalized ratio (INR) is at least 1.5 and the patient has major bleeding (e.g., intracranial hemorrhage) or needs a procedure within six hours (e.g., repair of a ruptured aortic aneurysm or perforated viscus). For elective reversal, guidelines support withholding warfarin or administering vitamin K.¹

Prothrombin complex concentrate is the preferred choice for emergency reversal of warfarin anticoagulation

Prothrombin complex concentrate is a human-derived blood product containing the vitamin K-dependent clotting factors (II, VII, IX, X, protein C and protein S) and heparin. This product is therefore contraindicated in patients with heparin-induced thrombocytopenia. In a prospective multicentre observational study, prothrombin complex concentrate rapidly and consistently corrected the INR.³ Comparison with plasma is shown in Table 1.

Table 1: Characteristics of prothrombin complex concentrate and frozen plasma

Characteristic	Prothrombin complex concentrate	Frozen plasma
Viral inactivation	Solvent/detergent treated and prion-reduction process	No viral inactivation or prion-reduction process
ABO group	ABO typing not required	Must be ABO compatible
Preparation time	5 minutes to reconstitute lyophilized product	30 minutes to thaw + 10 minutes for ABO typing
Volume	40 mL for 1000 IU*	Typically 1 L (15 mL/kg)
Administration time	15 minutes per 1000 IU*	2–4 hours
Duration of action	6 hour†	6 hour†
Caution	Use with caution in patients with recent history of arterial or venous thrombosis	Use with caution in patients with recent history of arterial or venous thrombosis

*Volume and administration time are listed for Octaplex, the only formulation currently available in Canada, and may vary with other prothrombin complex concentrates.

†If the patient is undergoing a procedure, administer the product as close to the procedure time as possible.

Vitamin K should be given intravenously at the time of emergency reversal of anticoagulation

Because of the temporary effects of blood products, vitamin K is required for sustained reversal of anticoagulation. The recommended dose is 10 mg intravenously.¹ The intravenous route acts more quickly than the oral route (6–12 hours v. 18–24 hours).²

The effect of prothrombin complex concentrate and frozen plasma is temporary

The duration of effect is based on the short half-life of factor VII (about six hours).¹ As a result, the effect of both products decreases after six hours.

The dose of prothrombin complex concentrate depends on the patient's weight and INR

National guidelines suggest 1000 IU of Octaplex, the formulation currently available in Canada, with adjustment of the dose for extremes of weight and INR.⁴ Regimens based on weight and INR are recommended in the product monograph and observational studies.^{3,5} Local hospital guidelines should be developed for recommended doses. The patient's INR needs to be determined within 30 minutes after administration to ensure adequate reversal of anticoagulation.

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The references are in Appendix 1 (available at www.cmaj.ca/cgi/content/full/cmaj.100983/DC1).

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