Vitamin K (phytomenadione) Intravenous for Adults

Who can administer

May be administered by registered competent doctor or nurse/midwife

Important information

- **T**his monograph refers to the use of the **Mixed Micelle formulation** (MM) only
- **Both the 10mg/1ml and the 2mg/0.2ml preparations** are licensed for intravenous injection **and oral use**
- **Excessively rapid administration can lead to reactions** including flushing, cyanosis, sweating, sense of chest constriction, peripheral vascular collapse

Available preparations

Konakion MM 10mg per 1ml ampoule (usual strength)

Konakion MM Paediatric 2mg per 0.2ml ampoule

Reconstitution

Already in solution

Draw up using a 5 micron filter needle

Methods of intravenous administration

Slow intravenous injection

- Dilute injection to 10 or 20ml **Glucose 5%** and administer required dose slowly over 3 to 5 minutes [ref 1] - see under "Important information"

Dose in adults

- Intravenous Vitamin K starts to work within six hours and both the oral and intravenous Vitamin K will have completely reversed the effect of warfarin within 24 hours
- The intravenous solution can be given orally and a 10mg ampoule diluted to 10ml with Glucose 5% will give a 1mg/ml solution from which the desired dose can then be given as a slow IV push
- The urgency of the requirement for reversal should determine the route of administration [ref 2]
- **Please give INTRAVENOUSLY if urgent reversal required** [ref 2]

Antidote to anticoagulants [ref 2,4,5] - see also further information	
MAJOR BLEEDING irrespective of INR. For example; intracranial bleed, retroperitoneal bleed, pericardial bleed, muscle bleed with compartment syndrome, GI bleed, vital organ bleed (e.g. eye), active bleed with low BP or 2g/dL drop in Hb	Stop warfarin
	Give Vitamin K 5 to 10mg intravenously
	Prothrombin Complex Concentrate (PCC OctaPLEXÂ®, available from GUH Blood Transfusion Lab) is the treatment of choice due to its rapid action, small volume and efficacy at reversing warfarin
	Advice from the Haematology should be sought wherever possible prior to use
	PCC is the only effective option when complete and immediate correction is required in orally anticoagulated patients with life or limb threatening haemorrhage
	Consult with Haematology for patients with liver disease or DIC for advice on dosing due to the high risk of thrombogenicity
	Prothrombin Complex Concentrate (OctaPLEXÂ®) is administered at a dose of 25 to 50 units/kg. INR 2 to 3.9 requires 25 units/kg INR greater than 4 requires 35 units/kg Doses of 50 units/kg are rarely required- repeat INR 20 minutes after administration of 25 to 35 units/kg- if persistently elevated- discuss with Haematology
	Recheck the coagulation screen 20 to 60 minutes post infusion and at least every 24 hours
	For CNS bleeds neurosurgical review is required
INR greater than 8, no bleeding or minor bleeding (e.g. self limiting skin or mucosal bleeding with no drop in blood pressure), or if risk of bleeding.	Stop warfarin for one or more days; restart warfarin when INR < 5
	Give Vitamin K 1mg to 3mg intravenously. This dose of Vitamin K will not cause warfarin resistance and may help stabilise the INR [ref 2]
	Recheck INR between 12 and 24 hours
	If the INR is still too high at 24 hours, the dose of Vitamin K can be repeated
INR 5 to 8, no bleeding or minor bleeding(e.g. self limiting skin or mucosal bleeding). If unsure regarding minor bleeding consult senior medical personnel	Stop warfarin
	Restart when INR < 5
	Consider Vitamin K 1 to 2mg orally if minor bleeding is present or if there are other risk factors for bleeding such as **age >70 years**, history of previous bleeding complications, previous TIA, stroke or previous GI bleed
INR less than 5 , no bleeding or minor bleeding (e.g. self limiting skin or mucosal bleeding)	Reduce warfarin dose or stop if appropriate
	Dose reductions of 10% to 20% usually required (dose reductions should be calculated based on total **weekly** dose)
	Aim for original target INR
Unexpected bleeding at therapeutic levels	Always investigate possibility of underlying cause e.g. unsuspected renal or gastro-intestinal tract pathology
Emergency/Urgent surgery	If surgery can be delayed for 18 to 24 hours, (but is necessary within 3 days) anticoagulation can be reversed with Vitamin K at a dose of 2mg to 5mg **INTRAVENOUSLY** to reduce the INR to < 1.5. This starts to work in six hours and will completely correct INR within 24 hours.
	If surgery is required immediately a larger dose of Vitamin K (5mg to 10mg IV) +/- Prothrombin Complex Concentrate may be required.
	Discuss with Haematology

Vitamin K deficiency, hypoprothrombinaemia due to drugs (other than coumarin derivatives) or factors limiting absorption or synthesis [ref 2]

- Usual dose is 10mg daily by intravenous injection, for two to three doses
- May correct within 24 hours. Recheck INR daily until normal

Liver disease

- Consider giving 10mg daily intravenously for three days to ensure no reversible coagulopathy. If no improvement after three days, then discontinue [ref 3]

Further information

- Phytomenadione is **ineffective** in the treatment of **hereditary hypoprothrombinaemia** [ref 2]
- **Hepatic impairment:** One 10mg ampoule contains 54.6mg glycocholic acid - this may have a bilirubin displacing effect
- The UK licence allows a slow intravenous injection to be given over at least 30 seconds. However, we have suggested the use of a slower rate, due to the risks associated with rapid intravenous injection

Storage

- Store below 25^{0}C

References

SPC Konakion MM 10mg October 2023

SPC Konakion MM 2mg October 2023

1: Injectable Medicines Administration Guide, downloaded from Medusa 4/10/2023

2: Dr Ruth Gilmore, Consultant Haematologist, expert opinion. 06/12/2023

3: Local specialist opinion- email on file 09/01/2024

4: BSH guideline: Management of Bleeding in Patients on Antithrombotic Agents, November 2012

5: BNF- accessed online 17/01/2024

Therapeutic classification

Vitamin