phytonadione (fye-toe-nad-ye-one)
Mephyton, vitamin K

**Classification**
Therapeutic: antidotes, vitamins
Pharmacologic: fat-soluble vitamins

**Pregnancy Category C**

**Indications**
Prevention and treatment of hypoprothrombinemia, which may be associated with:
- Excessive doses of oral anticoagulants
- Salicylates
- Certain anti-infective agents
- Nutritional deficiencies
- Prolonged total parenteral nutrition
- Prevention of hemorrhagic disease of the newborn

**Action**
Required for hepatic synthesis of blood coagulation factors II (prothrombin), VII, IX, and X.

**Therapeutic Effects:**
Prevention of bleeding due to hypoprothrombinemia.

**Pharmacokinetics**

**Absorption:** Well absorbed following oral or subcut administration. Oral absorption requires presence of bile salts. Some vitamin K is produced by bacteria in the GI tract.

**Distribution:** Crosses the placenta; does not enter breast milk.

**Metabolism and Excretion:** Rapidly metabolized by the liver.

**Half-life:** Unknown.

**TIME/ACTION PROFILE**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcut</td>
<td>1–2 hr</td>
<td>3–4 hr</td>
<td>12–24 hr</td>
</tr>
<tr>
<td>IV</td>
<td>1–2 hr</td>
<td>3–4 hr</td>
<td>12 hr</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**
- Use Cautiously in: Impaired liver function
- Exercise Extreme Caution in: Severe life-threatening reactions have occurred following IV administration, use other routes unless risks justified.

**Adverse Reactions/Side Effects**

**GI:** gastric upset, unusual taste.

**Derm:** flushing, rash, urticaria.

**Hemat:** hemolytic anemia.

**Local:** erythema, pain at injection site, swelling.

**Misc:** allergic reactions, hyperbilirubinemia (large doses in very premature infants), kernicterus.

**Interactions**

**Drug-Drug:** Large doses will counteract the effect of warfarin. Large doses of nonsteroidal anti-inflammatory agents (NSAIDs) may increase vitamin K requirements. Bile acid sequestrants, mineral oil, and macrolide may impair absorption from the GI tract.

**Route/Dosage**

**Treatment of Hypoprothrombinemia due to Vitamin K Deficiency** (from factors other than warfarin)

<table>
<thead>
<tr>
<th>Subcut, IV (Adults): 10 mg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO (Adults): 2.5–5 mg daily.</td>
</tr>
<tr>
<td>PO (Children &lt; 1 mo): 1–2 mg single dose.</td>
</tr>
<tr>
<td>PO (Children &gt; 1 mo): 2.5–5 mg daily</td>
</tr>
</tbody>
</table>

**Vitamin K Deficiency (Supratherapeutic INR) Secondary to Warfarin**

<table>
<thead>
<tr>
<th>Subcut, IV (Adults): INR 3.5 and 9 (no significant bleeding)—Hold warfarin and give 2.5–5 mg vitamin K; if more rapid reversal required, given 10 mg slow infusion.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV (Adults): INR &gt; 9 (no significant bleeding)—Hold warfarin and give 2.5–5 mg vitamin K.</td>
</tr>
<tr>
<td>IV (Children): 0.5–1 mg once weekly.</td>
</tr>
</tbody>
</table>

**Prevention of Hypoprothrombinemia during Total Parenteral Nutrition**

<table>
<thead>
<tr>
<th>IV (Adults): 5–10 mg once weekly.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV (Children): 2.5–5 mg once weekly.</td>
</tr>
</tbody>
</table>

**Use Cautiously in:** Impaired liver function

**ExerciSe Extreme Caution in:** Severe life-threatening reactions have occurred following IV administration, use other routes unless risks justified.

**Discontinued.**
Prevention of Hemorrhagic Disease of Newborn

IM (Neonates): 0.5–1 mg intra muscularly within 1 hr of birth may repeat in 6–8 hr if needed. May be repeated in 2–3 wk if mother received previous anticonvulsant/anticoagulant and antibiotics/antimicrobial therapy. 1–5 mg may be given IM to mother 12–24 hr before delivery.

Treatment of Hemorrhagic Disease of Newborn

IM, Subcut (Neonates): 1–2 mg/day.

NURSING IMPLICATIONS

Assessment

● Monitor for frank and occult bleeding (gum hemorrhage, Hematest urine, and emesis). Monitor pulse and BP frequently; notify health care professional immediately if symptoms of internal bleeding or hypovolemic shock develop. Inform all personnel of patient’s bleeding tendency to prevent further trauma. Apply pressure to all venipuncture sites for at least 5 min; avoid unnecessary IM injections.

● Pedi: Monitor for side effects and adverse reactions. Children may be especially sensitive to the effects and side effects of vitamin K. Neonates, especially premature neonates, may be more sensitive than older children.

● Lab Test Considerations: Monitor prothrombin time (PT) prior to and throughout vitamin K therapy to determine response to and need for further therapy.

Potential Nursing Diagnoses

Imbalanced nutrition: less than body requirements (indications)
Ineffective tissue perfusion (indications)

Implementation

● Do not confuse Mephyton (phytonadione) with methadone.

● The parenteral route is preferred for phytonadione therapy but, because of severe, potentially fatal hypersensitivity reactions, IV vitamin K is not recommended.

● Administration of whole blood or plasma may also be required in severe bleeding because of the delayed onset of this medication.

● Phytonadione is an antidote for warfarin overdose but does not counteract the anticoagulant action of heparin.

IV Administration

● pH: 5.0–7.0

● Intravenous Infusion: Diluent: D5W or D5/0.9% NaCl. Rate: Administer over 30–60 min. Rate should not exceed 1 mg/min.

● Y-Site Compatibility: alfentanil, amikacin, amphotericin B, ascorbic acid, atropine, azathioprine, aztreonam, bevacizumab, bumetanide, busulfan, calcium chloride, calcium gluconate, cefazolin, chlorpromazine, dexamethasone, doxorubicin, dexamethasone, diltiazem, dornase alfa, droperidol, enalapril, epidural, epinephrine, etoposide, famotidine, fenoldopam, folic acid, fonotein, ganciclovir, gentamicin, glycopyrrolate, heparin, hydrocortisone sodium succinate, imipenem/cilastatin, indomethacin, insulin, magnesium sulfate, metronidazole, methotrexate, mexiteline, midazolam, milrinone, nafcillin, nalbuphine, naloxone, nitroglycerin, norepinephrine, ondansetron, oxacillin, pentoxyfylline, pentobarbital, phenindione, phenylalanine, phenobarbital, phenylephrine, potassium chloride, propofol, propranolol, ranitidine, sodium bicarbonate, streptokinase, sucralfate, sucrose, succinylcholine, temazepam, theophylline, tobramycin, vancomycin, vasopressin, vecuronium, vitamin B complex, vitamin K.

Patient/Family Teaching

● Instruct patient to take phytonadione as directed. Take missed doses as soon as remembered unless almost time for next dose. Notify health care professional of missed doses.

● Cooking does not destroy substantial amounts of vitamin K. Patient should not drastically alter diet while taking vitamin K.

● Caution patient to avoid DM injections and activities leading to injury. Use a soft toothbrush, do not floss, and shave with an electric razor until coagulation defect is corrected.

● Advise patient to report any symptoms of unusual bleeding or bruising (bleeding gums, ecchymosis, black, tarry stools, hematuria, excessive menstrual flow).

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phytonadione

● Advise patient to notify health care professional of all Rx or OTC medications, vita-
mains, or herbal products being taken and to consult with health care professional
before taking other medications and alcohol.

● Advise patient to inform health care professional of medication regimen prior to

      treatment or surgery.

● Advise patient to carry identification at all times describing disease process.

● Emphasize the importance of frequent lab tests to monitor coagulation factors.

Evaluation/Desired Outcomes

● Prevention of spontaneous bleeding or cessation of bleeding in patients with hypo-

      prothrombinemia secondary to impaired intestinal absorption or oral anticoagu-

      lant, salicylate, or anti-infective therapy.

● Prevention of hemorrhagic disease in the newborn.

Why was this drug prescribed for your patient?