**DESCRIPTION**

Phytonadione is a vitamin which is a clear, yellow to amber, viscous, and nearly odorless liquid. It is insoluble in water, soluble in chloroform and slightly soluble in ethanol. It has a molecular weight of 450.70. Phytonadione is 2-methyl-3-phytyl-1, 4-naphthoquinone. Its empirical formula is C_{31}H_{46}O_2 and its structural formula is:

![Structural formula of Phytonadione](image)

Mephyton (phytonadione) tablets containing 5 mg of phytonadione are yellow, compressed tablets, scored on one side. Inactive ingredients are acacia, calcium phosphate, colloidal silicon dioxide, lactose, magnesium stearate, starch, and talc.

**CLINICAL PHARMACOLOGY**

Mephyton tablets possess the same type and degree of activity as does naturally-occurring vitamin K, which is necessary for the production via the liver of active prothrombin (factor II), proconvertin (factor VII), proconvertin thromboplastin component (factor IX), and Stuart factor (factor X). The prothrombin test is sensitive to the levels of these four factors – II, VII, and X. Vitamin K is an essential cofactor for a micosomal enzyme that catalyzes the posttranslational carboxylation of multiple, specific, peptide-bound glutamic acid residues in inactive hepatic precursors of factors II, VII, IX, and X. The resulting gamma-carboxyglutamic acid residues are necessary for the precocious conversion of prothrombin to its active clotting factors that are subsequently secreted by liver cells into the blood.

Oral phytonadione is adequately absorbed from the gastrointestinal tract only if bile salts are present. After absorption, phytonadione is initially concentrated in the liver, but the concentration declines rapidly. Very little vitamin K accumulates in tissues. Little is known about the metabolic fate of vitamin K. Almost no free unmetabolized vitamin K appears in bile or urine.

In normal animals and humans, phytonadione is virtually devoid of pharmacodynamic activity. However, in animals and humans deficient in vitamin K, the pharmacological action of vitamin K is related to its normal physiological function, that is, to promote the hepatic biosynthesis of vitamin K-dependent clotting factors.

Mephyton tablets generally exert their effect within 6 to 10 hours.

**INDICATIONS AND USAGE**

Mephyton is indicated in the following coagulation disorders which are due to faulty formation of factors II, VII, IX and X when caused by vitamin K deficiency or interference with vitamin K activity.

Mephyton tablets are indicated in:
- anticoagulant-induced prothrombin deficiency caused by coumarin or indanedione derivatives;
- hypoprothrombinaemia secondary to antibacterial therapy;
- hypoprothrombinaemia secondary to administration of salicylates;
- hypoprothrombinaemia secondary to obstructive jaundice or biliary fistulas but only if bile salts are administered concurrently, since otherwise the oral vitamin K will not be absorbed.

**CONTRAINDICATIONS**

Hypersensitivity to any component of this medication.

**WARNINGS**

An immediate coagulant effect should not be expected after administration of phytonadione. Phytonadione will not counteract the anticoagulant action of heparin.

When vitamin K is used to correct excessive anticoagulant-induced hypoprothrombinaemia, anticoagulant therapy still being indicated, the patient is again faced with the clotting hazards existing prior to starting the anticoagulant therapy. Phytonadione is not a clotting agent, but overzealous therapy with vitamin K may restore conditions which originally permitted thromboembolic phenomena. Dosage should be kept as low as possible, and prothrombin time should be checked regularly as clinical conditions indicate.

Repeated large doses of vitamin K are not warranted in liver disease and the response to initial use of the vitamin is unsatisfactory. Failure to respond to vitamin K may indicate a congenital coagulation defect or that the condition being treated is unresponsive to vitamin K.

**PRECAUTIONS**

General

Vitamin K is fairly rapidly degraded by light; therefore, always protect Mephyton from light. Store Mephyton in closed original carton until contents have been used. (See HOW SUPPLIED, Storage.)

Drug Interactions

Temporary resistance to prothrombin-depressing anticoagulants may result, especially when larger doses of phytonadione are used. If relatively large doses have been employed, it may be necessary when reinnstituting anticoagulant therapy to use somewhat larger doses of the prothrombin-depressing anticoagulant or to use one which acts on a different principle, such as heparin sodium.

**Laboratory Tests**

Prothrombin time should be checked regularly as clinical conditions indicate.

Carcinogenesis, Mutagenesis, Impairment of Fertility

Studies of carcinogenicity or impairment of fertility have not been performed with Mephyton. Mephyton at concentrations up to 2,000 mcg/ml, plate, with or without metabolic activation, was negative in the Ames microbial mutagen test.

Pregnancy

Animal reproduction studies have not been conducted with Mephyton. It is also not known whether Mephyton can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Mephyton should be given to a pregnant woman only if clearly needed.

**Pediatric Use**

Safety and effectiveness in pediatric patients have not been established with Mephyton. Hemolysis, jaundice, and hyperbilirubinemia in newborns, particularly in premature infants, have been reported with vitamin K.

**Nursing Mothers**

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Mephyton is administered to a nursing woman.

**Geriatric Use**

Clinical studies of Mephyton did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. However, reported clinical experience has not identified differences in responses between the elderly and younger patients. In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosage range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy.

**ADVERSE REACTIONS**

Severe hypersensitivity reactions, including anaphylactoid reactions and deaths, have been reported following parenteral administration. The majority of these reported events occurred following intravenous administration.

Transient "flushing sensations" and "peculiar" sensations of taste have been observed with parenteral phytonadione, as well as rare instances of overzealous therapy with vitamin K 1 may restore conditions which originally permitted thromboembolic phenomena. Dosage should be kept as low as possible, and prothrombin time should be checked regularly as clinical conditions indicate.

**OVERDOSAGE**

The intravenous and oral LD50s in the mouse are approximately 1.17 g/kg and greater than 24.18 g/kg, respectively.

**DOSEAGE AND ADMINISTRATION**

**Mephyton**

**Summary of Dosage Guidelines**

(See circular text for details.)

**Adults**

**Initial Dose**

**Anticoagulant-Induced Prothrombin Deficiency**

- (caused by coumarin or indanedione derivatives)
  - 2.5 mg-10 mg or up to 25 mg initially is recommended.
  - In rare instances 50 mg may be required. Frequency and amount of subsequent doses should be determined by prothrombin time response or clinical condition. (See WARNINGS.) If, in 12 to 48 hours after oral administration, the prothrombin time has not been shortened satisfactorily, the dose should be repeated.

**Hypoprothrombinemia Due to Other Causes in Adults**

If possible, discontinuation or reduction of the dosage of drugs interfering with coagulation mechanisms (such as salicylates, antibiotics) is suggested as an alternative to administering concurrent Mephyton. The severity of the coagulation disorder should determine whether the immediate administration of Mephyton is required in addition to discontinuation or reduction of the drugs causing it.

A dosage of 2.5 to 25 mg or more (rarely up to 50 mg) is recommended. The amount and route of administration depending upon the severity of the condition and response obtained. The oral route should be avoided when the clinical disorder would prevent proper absorption. Bile salts must be given with the tablets when the endogenous supply of bile to the gastrointestinal tract is deficient.

**HOW SUPPLIED**

Mephyton tablets, 5 mg vitamin K1, are yellow, round, scored, compressed tablets, coded VRX 405 on one side and MEPHYTON on the other. They are supplied as follows: NDC 0187-1704-05 bottles of 100.

**Storage:** Store at 25°C (77°F) excursions permitted to 15-30°C (59-86°F) See USP Controlled Room Temperature. Protect from light. Store in tightly closed original container and carton until contents have been used. (See PRECAUTIONS, General.)

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