

## **1 NAME OF THE MEDICINAL PRODUCT**

Phenobarbital Bristol Labs 60mg Tablets

## **2 QUALITATIVE AND QUANTITATIVE COMPOSITION**

Each tablet contains Phenobarbital Ph Eur 60mg

Also contains Lactose Ph Eur 16.430mg

For the full list of excipients, see section 6.1

## **3 PHARMACEUTICAL FORM**

Tablet.

Smooth unmottled tablets showing no evidence of chipping or capping; free from specks and extraneous matter; odorless.

## **4 CLINICAL PARTICULARS**

### **4.1 Therapeutic indications**

Phenobarbital is recommended for all forms of epilepsy (except absence seizures).

### **4.2 Posology and method of administration**

Posology

Adults: The usual dose is 60 – 180mg daily taken at night.

Children: 5- 8mg/kg body weight daily.

Elderly: Phenobarbital clearance diminishes in the elderly. Therefore, the dose of phenobarbital is usually lower in elderly patients.

The dose of phenobarbital should be adjusted to meet the needs to individual patients. This usually requires plasma concentration of 15 to 40 micrograms/ml (65 to 170 micromoles/litre).

Method of Administration

For oral administration.

### **4.3 Contraindications**

Phenobarbital should not be given to patients with:

- Hypersensitivity to phenobarbital, other barbiturates or to any of the excipients listed in section 6.1.
- Acute intermittent porphyria
- Severe respiratory depression
- Severe renal or hepatic impairment

#### **4.4 Special warnings and precautions for use**

Life-threatening cutaneous reactions Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) have been reported with the use of Phenobarbital. Patients should be advised of the signs and symptoms and monitored closely for skin reactions. The highest risk for occurrence of SJS or TEN is within the first weeks of treatment. If symptoms or signs of SJS or TEN (e.g. progressive skin rash often with blisters or mucosal lesions) are present, Phenobarbital treatment should be discontinued. The best results in managing SJS and TEN come from early diagnosis and immediate discontinuation of any suspect drug. Early withdrawal is associated with a better prognosis. If the patient has developed SJS or TEN with the use of Phenobarbital, Phenobarbital must not be re-started in this patient at any time.

Suicidal ideation and behaviour have been reported in patients treated with anti-epileptic agents in several indications. A meta-analysis of randomised placebo controlled trials of anti-epileptic drugs has also shown a small increased risk of suicidal ideation and behaviour. The mechanism of this risk is not known and the available data do not exclude the possibility of an increased risk for Phenobarbital.

Therefore patients should be monitored for signs of suicidal ideation and behaviours and appropriate treatment should be considered. Patients (and caregivers of patients) should be advised to seek medical advice should signs of suicidal ideation or behaviour emerge.

##### **Women of childbearing potential**

Phenobarbital may cause foetal harm when administered to a pregnant woman. Prenatal exposure to phenobarbital may increase the risk for congenital malformations approximately 2- to 3-fold (see section 4.6).

Phenobarbital should not be used in women of childbearing potential unless the potential benefit is judged to outweigh the risks following consideration of other suitable treatment options. Women of childbearing potential should be fully informed of the potential risk to the fetus if they take phenobarbital during pregnancy.

A pregnancy test to rule out pregnancy should be considered prior to commencing treatment with phenobarbital in women of childbearing potential.

Women of childbearing potential should use highly effective contraception during treatment and for 2 months after the last dose. Due to enzyme induction, phenobarbital may result in a failure of the therapeutic effect of oral contraceptive drugs containing oestrogen and/or progesterone. Women of childbearing potential should be advised to use other contraceptive methods (see sections 4.5 and 4.6).

Women planning a pregnancy should be advised to consult in advance with her physician so that adequate counselling can be provided and appropriate other treatment options can be discussed prior to conception and before contraception is discontinued.

Women of childbearing potential should be counselled to contact her doctor immediately if she becomes pregnant or thinks she may be pregnant while on treatment with phenobarbital.

**Care should be used in the following situations:**

- Respiratory depression (avoid if severe)
- Young, debilitated or senile patients
- Renal impairment
- Existing liver disease
- Sudden withdrawal should be avoided as severe withdrawal syndrome (rebound insomnia, anxiety, tremor, dizziness, nausea, fits and delirium) may be precipitated
- Acute chronic pain –paradoxical excitement may be induced or important symptoms masked.
- Prolonged use may result in dependence of the alcohol-barbiturate type. Care should be taken in treating patients with a history of drug abuse or alcoholism.

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**Important information regarding the ingredients in this medicine**

Patients with rare hereditary problems of galactose intolerance, total lactase deficiency or glucose-galactose malabsorption should not take this medicine.

#### **4.5 Interaction with other medicinal products and other forms of interaction**

| <b>Effects on Phenobarbital</b> | <b>Effects of phenobarbital on other medicines</b> |
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| <ul style="list-style-type: none"> <li>• Alcohol –concurrent administration with alcohol may lead to an additive CNS depressant effect. This is likely with concurrent administration with other CNS depressants.</li> <li>• Antidepressants –including MAOIs, SSRIs and tricyclics may antagonise the antiepileptic activity of phenobarbital by lowering the convulsive threshold.</li> <li>• Antiepileptics - phenobarbital plasma concentrations increased by oxcarbazepine, phenytoin and sodium valproate. Vigabatrin possibly decreases phenobarbital plasma concentrations.</li> <li>• Antipsychotics –concurrent use of chlorpromazine and thioridazine with phenobarbital can reduce the serum levels of either drug.</li> <li>• Folic acid –if folic acid supplements are given to treat folate deficiency, which can be caused by the use of phenobarbital, the serum phenobarbital levels may fall, leading to decreased seizure control in some patients. (see section 4.6).</li> <li>• Memantine –the effect of Phenobarbital is possibly reduced.</li> <li>• Methylphenidate–plasma concentration of Phenobarbital is possibly increased.</li> <li>• St John's wort (<i>Hypericum perforatum</i>) – the effect of phenobarbital can be reduced by concomitant use of the herbal remedy St John's wort.</li> </ul> | <p>Phenobarbital increases the rate of metabolism reducing serum concentrations of the following drugs:</p> <ul style="list-style-type: none"> <li>• Anti-arrhythmics –disopyramide and quinidine loss of arrhythmia control is possible. Plasma levels of antiarrhythmics should be monitored, if phenobarbital is added or withdrawn. Changes in dosage may be necessary.</li> <li>• Antibacterials –chloramphenicol, doxycycline, metronidazole and rifampicin. Avoid concomitant use of telithromycin during and for 2 weeks after Phenobarbital.</li> <li>• Anticoagulants.</li> <li>• Antidepressants –paroxetine, mianserin and tricyclic antidepressants.</li> <li>• Antiepileptics–carbamazepine, lamotrigine, tiagabine, zonisamide, primidone and possibly ethosuxamide.</li> <li>• Antifungals –the antifungal effects of griseofulvin can be reduced or even abolished by concurrent use. Phenobarbital possibly reduces plasma concentrations of itraconazole or posaconazole. Avoid concomitant use of voriconazole.</li> <li>• Antipsychotics –phenobarbital possibly reduces concentration of aripiprazole.</li> <li>• Antivirals –phenobarbital possibly reduces plasma levels of abacavir, amprenavir, darunavir, lopinavir, indinavir, nelfinavir, saquinavir.</li> <li>• Anxiolytics and Hypnotics –clonazepam.</li> <li>• Aprepitant –phenobarbital possibly reduces plasma concentration of aprepitant.</li> <li>• Beta-blockers –metoprolol, timolol and possibly propranolol.</li> <li>• Calcium channel blockers –</li> </ul> |
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|  | <ul style="list-style-type: none"> <li>• phenobarbital causes reduced levels of felodipine, isradipine, diltiazem, verapamil, nimodipine and nifedipine and an increase in dosage may be required.</li> <li>• Cardiac Glycosides –blood levels of digitoxin can be halved by concurrent use.</li> <li>• Ciclosporin or tacrolimus.</li> <li>• Corticosteroids.</li> <li>• Cytotoxics –phenobarbital possibly reduces the plasma levels of etoposide or irinotecan.</li> <li>• Diuretics –concomitant use with eplerenone should be avoided.</li> <li>• Haloperidol- serum levels are approximately halved by concurrent use with phenobarbital.</li> <li>• Hormone Antagonists –gestrinone and possibly toremifene.</li> <li>• Methadone –levels can be reduced by concurrent use of phenobarbital and withdrawal symptoms have been reported in patients maintained on methadone when phenobarbital has been added. Increases in the methadone dosage may be necessary.</li> <li>• Montelukast.</li> <li>• Oestrogens –reduced contraceptive effect.</li> <li>• Progestogens –reduced contraceptive effect.</li> <li>• Sodium oxybate –enhanced effects, avoid concomitant use.</li> <li>• Theophylline –may require an increase in theophylline dose.</li> <li>• Thyroid hormones-may increase requirements for thyroid hormones in hypothyroidism.</li> <li>• Tibolone</li> <li>• Tropisetron</li> <li>• Vitamins –barbiturates possibly increase requirements for vitamin D</li> </ul> |
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Patients treated concomitantly with valproate and phenobarbital should be monitored for signs of hyperammonemia. In half of the reported cases hyperammonemia was asymptomatic and does not necessarily result in clinical encephalopathy.

Phenobarbital may interfere with some laboratory tests including metyrapone test, phenolamine tests and serum bilirubin estimation.

## 4.6 Fertility, pregnancy and Lactation

### Women of childbearing potential/Contraception

Phenobarbital should not be used in women of childbearing potential unless the potential benefit is judged to outweigh the risks following careful consideration of alternative suitable treatment options.

A pregnancy test to rule out pregnancy should be considered prior to commencing treatment with phenobarbital in women of childbearing potential.

Women of childbearing potential should use highly effective contraception during treatment with phenobarbital and for 2 months after the last dose. Due to enzyme induction, phenobarbital may result in a failure of the therapeutic effect of oral contraceptive drugs containing oestrogen and/or progesterone. Women of childbearing potential should be advised to use other contraceptive methods while on treatment with phenobarbital, e.g. two complementary forms of contraception including a barrier method, oral contraceptive containing higher doses of estrogen, or a non-hormonal intrauterine device (see section 4.5).

Women of childbearing potential should be informed of and understand the risk of potential harm to the fetus associated with phenobarbital use during pregnancy and the importance of planning a pregnancy.

Women planning a pregnancy should be advised to consult in advance with her physician so that specialist medical advice can be provided and appropriate other treatment options can be discussed prior to conception and before contraception is discontinued.

Antiepileptic treatment should be reviewed regularly and especially when a woman is planning to become pregnant.

Women of childbearing potential should be counselled to contact her doctor immediately if she becomes pregnant or thinks she may be pregnant while on treatment with phenobarbital.

### *Pregnancy*

#### Risk related to antiepileptic medicinal products in general

Specialist medical advice regarding the potential risks to a fetus caused by both seizures and antiepileptic treatment should be given to all women of childbearing potential taking antiepileptic treatment, and especially to women planning pregnancy and women who are pregnant.

Antiepileptic treatment should be reviewed regularly and especially when a woman is planning to become pregnant. In pregnant women being treated for epilepsy, sudden discontinuation of antiepileptic drug (AED) therapy should be avoided as this may lead to breakthrough seizures that could have serious consequences for the woman and the unborn child.

As a general principle, monotherapy is preferred for treating epilepsy in pregnancy whenever possible because therapy with multiple AEDs could be associated with a higher risk of congenital malformations than monotherapy, depending on the associated AEDs.

*Pregnancy*Risks related to phenobarbital

Phenobarbital crosses the placenta. Animal studies (literature data) have shown reproductive toxicity in rodents (see section 5.3).

Data from meta-analysis and observational studies showed a risk of major malformations about 2 to 3 times higher than the baseline risk of major malformations in the general population (which is 2-3%). The risk is dose-dependent; however, no dose has been found to be without risk. Phenobarbital monotherapy is associated with an increased risk of major congenital malformations, including cleft lip and palate and cardiovascular malformations. Other malformations involving various body systems including cases of hypospadias, facial dysmorphic features, neural tube effects, craniofacial dysmorphism (microcephaly) and digital abnormalities have also been reported.

Phenobarbital readily crosses the placenta following oral administration and is distributed throughout fetal tissue, the highest concentrations being found in the placenta, fetal liver and brain.

Phenobarbital therapy in epileptic pregnant women presents a risk to the fetus in terms of major and minor congenital defects including congenital craniofacial and cardiac defects, digital abnormalities and, less commonly, cleft lip and palate. Studies in women with epilepsy who were exposed to phenobarbital during pregnancy identified a frequency of major malformations of 6-7% in their offspring compared to the background rate in the general population of 2-3%. Studies have found the risk of congenital malformations following in-utero exposure to phenobarbital to be dose-dependent, however, no dose has been found to be without risk. Therefore, the lowest effective dose should be used.

Adverse effects on neurobehavioral development have also been reported. Studies investigating neurodevelopmental effects of prenatally administered phenobarbital were mostly small in numbers; however, significant negative effects on neurodevelopment and IQ were found following in utero and postnatal exposure.

Data from a registry study suggest an increase in the risk of infants born small for gestational age or with reduced body length to women with epilepsy who were exposed to phenobarbital during pregnancy compared to women exposed to lamotrigine monotherapy during pregnancy.

Neurodevelopmental disorders have been reported among children exposed to phenobarbital during pregnancy. Studies related to the risk of neurodevelopmental disorders in children exposed to phenobarbital during pregnancy are contradictory and a risk cannot be excluded. Pre-clinical studies have also reported adverse neurodevelopment effects (see section 5.3).

Phenobarbital should not be used during pregnancy unless the potential benefit is judged to outweigh the risks following consideration of other suitable treatment options.

If, following re-evaluation of treatment with phenobarbital, no other treatment option is suitable, the lowest effective dose of phenobarbital should be used. The woman should be fully informed of and understand the risks related to the use of phenobarbital during pregnancy.

When used in the third trimester of pregnancy, withdrawal symptoms may occur in the neonate, including sedation, hypotonia and sucking disorder.

Patients taking phenobarbital should be adequately supplemented with folic acid before conception and during pregnancy (see section 4.5).

Folic acid supplementation during pregnancy can help to reduce the risk of neural defects to the infant. Haemorrhage at birth and addiction are also a risk. Prophylactic treatment with vitamin K1 for the mother before delivery (as well as the neonate) is recommended, the neonate should be monitored for signs of bleeding.

#### Breast-feeding

Phenobarbital is excreted into breast milk and there is a small risk of neonatal sedation. Breast feeding is therefore not advisable.

### **4.7. Effects on Ability to Drive and Use Machines**

Phenobarbital may impair the mental and/or physical abilities required for the performance of potentially hazardous tasks such as driving a car or operating machinery. Patients should be advised to make sure they are not affected before undertaking any potentially hazardous tasks.

### **4.8 Undesirable effects**

- *Blood and the lymphatic system disorders:* megaloblastic anaemia (due to folate deficiency), agranulocytosis, thrombocytopenia.
  - *Musculoskeletal and connective tissue disorders:* Dupuytren's contracture, frozen shoulder, arthralgia, osteomalacia, rickets.
- There have been reports of decreased bone mineral density, osteopenia, osteoporosis and fractures in patients on long-term therapy with phenobarbital. The mechanism by which phenobarbital affects bone metabolism has not been identified.
- *Reproductive and breast disorders:* Peyronie's disease
  - *Psychiatric disorders:* paradoxical reaction (unusual excitement), hallucinations, restlessness and confusion in the elderly, mental depression, memory and cognitive impairment, drowsiness, lethargy.
  - *Nervous system disorders:* hyperactivity, behavioral disturbances in children, ataxia, nystagmus.
  - *Cardiac disorders:* hypotension.
  - *Respiratory disorders:* respiratory depression.
  - *Hepato-biliary:* hepatitis, cholestasis.
  - *Skin and subcutaneous tissue disorders:* allergic skin reactions (maculopapular morbilliform or scarlatiniform rashes), other skin reactions such as exfoliative dermatitis, erythema multiforme are rare.

*Very Rare:* Severe cutaneous adverse reactions (SCARs): Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) have been reported (see section 4.4).

- *General disorders and administration site conditions:* antiepileptic hypersensitivity syndrome (features include fever, rash, lymphadenopathy, lymphocytosis, eosinophilia, haematological abnormalities, hepatic and other organ involvement including renal and pulmonary systems which may become life threatening).



### **Reporting of Suspected Adverse Reactions**

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via the Yellow Card Scheme at: [www.mhra.gov.uk/yellowcard](http://www.mhra.gov.uk/yellowcard) or search for MHRA Yellow Card in the Google Play or Apple App Store.

## **4.9 Overdose**

Toxicity varies between patients; tolerance will develop with chronic use. Features of poisoning are to be expected after ingestion of 1g in adults.

### Features:

Drowsiness, dysarthria, ataxia, nystagmus and disinhibition. There may also be coma, cardiovascular collapse, cardiac arrest, hypotension, hypotonia, hyporeflexia, hypothermia, hypotension and respiratory depression. Barbiturates decrease gut motility, which may lead to slow onset and worsening of symptoms or cyclical improvement and worsening of symptoms.

### Management:

Consider activated charcoal (50g for an adult, 10-15g for a child under 5 years) if more than 10mg/kg body weight of phenobarbital has been ingested within 1 hour, provided the airway can be protected. Repeat dose activated charcoal is the best method of enhancing elimination of phenobarbital in symptomatic patients. In severe hypotension dopamine or dobutamine can be used. Treat rhabdomyolysis with urinary alkalinisation. Haemodialysis or haemofiltration may be required for cases of acute renal or severe hyperkalaemia.

Charcoal haemoperfusion is the treatment of choice for the majority of patients with severe barbiturate poisoning who fail to improve, or who deteriorate despite good supportive care.

## **5 PHARMACOLOGICAL PROPERTIES**

### **5.1 Pharmacodynamic properties**

ATC Code: N03A A02,

Pharmacotherapeutic group: Antiepileptics.

Phenobarbital is a long-acting barbiturate, which because of its depressant effect on the motor cortex, is used in the treatment of epilepsy.

Phenobarbital has a widespread depressant action on cerebral function. It has sedative effects and has some protective action against all varieties of human partial and generalised epilepsy, with the exception of absence seizures. Phenobarbital is also effective in preventing seizures

in the corresponding experimental animal models of epilepsy. In different studies Phenobarbital appears to have had inconsistent effects in suppressing experimental epileptic foci, and epileptic after-discharges, but it inhibits synaptic transmission, at least in the spinal cord. The drug's probable biochemical mechanism of action is through prolonging the opening time of Cl<sup>-</sup> ion channels in postsynaptic neuronal membranes. This effect causes membrane hyperpolarisation and thus impairs nerve impulse propagation. Phenobarbital also decreases intraneuronal Na<sup>+</sup> concentrations, and inhibits Ca<sup>2+</sup> influx into depolarized synaptosomes. It raises brain serotonin levels, and inhibits noradrenaline (norepinephrine) reuptake into synaptosomes. These additional biochemical actions may contribute towards the anticonvulsant effects of the drug.

## **5.2. Pharmacokinetic Properties**

**Absorption** –phenobarbital is readily absorbed from the gastrointestinal tract, although it is relatively lipid –insoluble; peak concentrations are reached in about 2 hours after oral administration.

**Distribution** –phenobarbital is about 45 to 60% bound to plasma proteins. Phenobarbital crosses the placental barrier and is distributed into breast milk.

**Metabolism** –the plasma half life is about 75 to 120 hours in adults but is greatly prolonged in neonates, and shorter (about 21 to 75 hours) in children. There is considerable interindividual variation in phenobarbital kinetics. Phenobarbital is only partly metabolised in the liver.

**Elimination** –about 25% of a dose is excreted in the urine unchanged at normal urinary pH.

## **5.3. Preclinical Safety Data**

Published studies reported teratogenic effects (morphological defects) in rodents exposed to phenobarbital. Cleft palate is reported consistently in all preclinical studies but other malformations are also reported (e.g. umbilical hernia, spina bifida, exencephaly, exomphalos plus fused ribs) in single studies or species.

In addition, although data from the published studies are inconsistent, phenobarbital given to rats/mice during gestation or early postnatal period was associated with adverse neurodevelopment effects, including alterations in locomotor activity, cognition and learning patterns.

# **6 PHARMACEUTICAL PARTICULARS**

## **6.1 List of excipients**

Maize starch, pregelatinised

Lactose

Maize starch  
Stearic acid  
Water purified

**6.2 Incompatibilities**

Not applicable.

**6.3 Shelf life**

36 months.

**6.4 Special precautions for storage**

Do not store above 25°C. Store in the original package.

**6.5 Nature and contents of container**

Blister packs comprising of 250 micron Opaque PVC film and 20 micron Aluminium foil  
Pack sizes: 28 tablets

**6.6 Special precautions for disposal**

None stated.

**7 MARKETING AUTHORISATION HOLDER**

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Northbridge Road  
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HP4 1EG  
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**8 MARKETING AUTHORISATION NUMBER(S)**

PL 17907/0177

**9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE  
AUTHORISATION**

17/11/2005

## **10     DATE OF REVISION OF THE TEXT**

10/11/1021