



### 1. Generic Name

Amitriptyline + Mecobalamine

### 2. Qualitative and Quantitative Composition

Amitriptyline 5/ 10 / 25 mg

Mecobalamin SR 1500 mcg

### 3. Dosage form and strength

Tablets are available in the strength of 5/ 10/ 25 mg

### 4. Clinical particulars

#### 4.1 Therapeutic indication

AmNuring tablets are indicated in patients with:

- Peripheral neuropathies
- Neuritis
- Diabetic Neuropathy
- Spondylitis
- Chronic Low Back Pain
- Radiculopathy
- Trigeminal neuralgia
- Post Herpetic Neuralgia

#### 4.2 Posology and method of administration

As directed by physician.

#### 4.3 Contraindication

AmNuring tablets are contraindicated in patients with:

- Hypersensitivity to any component
- It should not be given concomitantly with a MAO inhibiting compound.
- Impaired liver function
- History of urinary retention – Benign Prostatic Hypertrophy (BPH)
- Pregnancy and Lactation

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

- Amitriptyline should be used with caution in patients with a history of seizures, impaired liver function, a history of hepatic damage or blood dyscrasias and, because of its atropine-like action, in patients with a history of urinary retention, or with narrow-angle glaucoma or increased intraocular pressure.
- In patients with narrow-angle glaucoma, even average doses may precipitate an attack.
- There has been a report of fatal dysrhythmia occurring as late as 56 hours after amitriptyline overdose. Patients with cardiovascular disorders should be watched closely.
- Tricyclic antidepressant drugs, including amitriptyline, particularly when given in high doses, have been reported to produce arrhythmias, sinus tachycardia, and prolongation of the conduction time. A few instances of unexpected deaths have been reported in patients with cardiovascular disorders. Myocardial infarction and stroke have also been reported with drugs of this class. Therefore, these drugs should be used with caution in patients with a history of cardiovascular disease, such as myocardial infarction and congestive heart failure.
- Close supervision is required when amitriptyline is given to hyperthyroid patients or that receiving thyroid medication.
- The potency of amitriptyline is such that addition of other antidepressant drugs generally does not result in any additional therapeutic benefit. Untoward reactions have been reported after the combined use of



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antidepressant agents having varying modes of activity. Accordingly, combined use of amitriptyline and other antidepressant drugs should be undertaken only with due recognition of the possibility of potentiation and with a thorough knowledge of the pharmacology of both drugs.

- There have been no reports of untoward events when patients receiving amitriptyline were changed immediately to protriptyline or vice versa. Discontinue the drug several days before elective surgery if possible.

#### **4.5 Drug interactions**

- Amitriptyline may block the antihypertensive action of guanethidine or similarly acting compounds.
- When amitriptyline is given with anticholinergic agents or sympathomimetic drugs, including epinephrine combined with local anesthetics, close supervision and careful adjustment of dosage are required.
- Since amitriptyline, in combination with anticholinergic type drugs, may give rise to paralytic ileus, particularly in elderly or hospitalized patients, appropriate measures should be taken if constipation occurs in these patients.
- Cimetidine is reported to reduce hepatic metabolism of certain tricyclic antidepressants.
- Caution is advised if patients receive large doses of ethchlorvynol concurrently. Transient delirium has been reported in patients who were treated with 1 g of ethchlorvynol and 75 to 150 mg of amitriptyline.
- Amitriptyline may enhance the response to alcohol and the effects of barbiturates and other CNS depressants. Delirium has been reported with concurrent administration of amitriptyline and disulfiram.
- Hyperpyrexia has been reported when tricyclic antidepressants are administered with anticholinergic agents or with neuroleptic drugs, particularly during hot weather.



- Decreased GI tract absorption with neomycin, aminosalicic acid, H2-blockers and colchicine.
- Reduced serum concentrations with oral contraceptives.
- Reduced effects in anaemia with parenteral chloramphenicol.
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#### **4.6 Use in special population**

- Paediatric: Behavioural changes have been observed in children receiving tricyclics for the treatment of enuresis.
- Geriatric: Elderly patients are particularly liable to experience adverse reactions: especially agitation, confusion and postural hypotension. In general, lower doses are recommended for elderly patients who should be increased slowly if required. The required dosage may be administered either as divided doses or as a single dose preferably in the evenings or at bedtime
- Liver impairment: Contraindicated in patients with liver impairment.
- Renal failure: Use with caution.
- Pregnancy and lactation: Do not use during pregnancy, especially during the first and last trimesters, unless there are compelling reasons. There is no, or inadequate evidence of safety of the drug in human pregnancy; although it has been in wide use for many years without apparent ill-consequence. There is evidence of harmful effects in pregnancy in animals, when given in exceptionally high doses. Amitriptyline is detectable in breast milk. Because of the potential serious adverse reactions in infants from amitriptyline, a decision should be made whether to discontinue breast-feeding or discontinue the drug.

#### **4.7 Effects on ability to drive and use machine**

Patients should be cautioned against engaging in activities requiring complete mental alertness, and motor coordination such as operating machinery until their response to Am-Nuring tablet is known.

#### **4.8 Undesirable effects**

- Behavioural:

drowsiness, fatigue, activation of latent schizophrenia, disorientation, confusional states, hallucinations, delusions, hypomanic reactions, disturbed concentration, nightmares, insomnia, restlessness, agitation, excitement, jitteriness, anxiety, giddiness.

- Neurological:

epileptiform seizures, coma, dizziness, tremors, numbness, tingling, paraesthesia of the extremities, peripheral neuropathy, headache, ataxia, alteration in EEG patterns, extrapyramidal symptoms including abnormal involuntary movements and tardive dyskinesia, dysarthria, tinnitus, incoordination, and slurred speech.

- Anticholinergic:

urinary retention, dilatation of the urinary tract, constipation, paralytic ileus, especially in the elderly, hyperpyrexia, dry mouth, blurred vision, disturbance of accommodation, increased intraocular pressure, precipitation of latent glaucoma, aggravation of existing glaucoma, and mydriasis.

- Cardiovascular:

quinidine-like effect and other non-specific ECG changes and changes in AV conduction, prolonged conduction time, asystole, hypotension, syncope, hypertension, palpitation, arrhythmias, heart block, ventricular tachycardia, fibrillation, myocardial infarction, stroke, unexpected death in patients with cardiovascular disorders.

- Hematologic:

bone marrow depression, including agranulocytosis, leukopenia, eosinophilia, purpura, thrombocytopenia. Allergic: skin rash, urticaria, photosensitization, edema of the face and tongue, itching.

- **Gastrointestinal:**

nausea, epigastric distress, heartburn, vomiting, hepatitis (including altered liver function and jaundice), anorexia, stomatitis, peculiar taste, diarrhea, parotid swelling, black tongue may occur.

- **Endocrine:**

testicular swelling, gynecomastia and impotence in the male, breast enlargement and galactorrhea in the female, increased or decreased libido, elevation and lowering of blood sugar levels, syndrome of inappropriate ADH (antidiuretic hormone) secretion.

- **Miscellaneous:**

weakness, increased perspiration, edema, urinary frequency, alopecia, increased appetite, weight gain, weight loss.

- **Withdrawal Symptoms:**

Abrupt cessation of treatment after prolonged administration may produce nausea, headache, and malaise. Gradual dosage reduction has been reported to produce, within 2 weeks, transient symptoms including irritability, restlessness, and dream and sleep disturbance. These symptoms are not indicative of addiction. Rare instances have been reported of mania or hypomania occurring within 2 to 7 days following cessation of chronic therapy with tricyclic antidepressants. As Mecobalamin is a water soluble vitamin, it does not accumulate in the body causing toxicity,

#### **4.9 Overdose**

High doses of amitriptyline may cause temporary confusion, disturbed concentration, or transient visual hallucinations. Overdosage may cause hypothermia; drowsiness; tachycardia and other arrhythmic abnormalities such as bundle branch block; congestive heart failure; ECG evidence of impaired conduction; dilated pupils; disorders of ocular motility, convulsions; severe hypotension; stupor, coma and polyradiculoneuropathy; constipation. Other symptoms which may occur include agitation, muscle rigidity, hyperactive reflexes, hyperpyrexia, vomiting or any of the effects listed in the section on undesirable effects



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above. All persons suspected of having taken an overdose should be admitted to hospital as soon as possible. Treatment is symptomatic and supportive. The stomach should be emptied as quickly as possible by emesis, followed by gastric lavage once in hospital. Following gastric lavage, oral administration of activated charcoal during the first 24 - 48 hours at a dosage of 20 - 30 g every four to six hours has been shown to reduce the delayed toxic effects due to enterohepatic circulation and slow absorption. An ECG should be taken and the cardiac function should be monitored closely if there is any sign of abnormality. An open airway and an adequate fluid intake should be maintained; body temperature should be regulated. Physostigmine salicylate, 1-3 mg, given intravenously has been reported to reverse the symptoms of tricyclic antidepressant poisoning. Because of the rapid metabolism of physostigmine, the dosage of physostigmine should be repeated as required, particularly if life-threatening signs such as convulsions, arrhythmias and deep coma recur or persist after the initial dose of physostigmine. Because physostigmine may itself be toxic, it is not recommended for routine use. Standard measures should be employed to manage circulatory shock and metabolic acidosis. Cardiac arrhythmias may be treated with neostigmine, pyridostigmine or propranolol. If cardiac failure occurs, use of digitalis should be considered. It is advisable to closely monitor cardiac function for at least five days. If convulsions occur, they should be treated with paraldehyde, diazepam or an inhalation anaesthetic. Barbiturates should not be used because amitriptyline increases their CNS depressant action. Dialysis is of no value in amitriptyline overdose because of the low plasma concentrations of amitriptyline. Since overdose is often deliberate, patients may attempt suicide by other means during the recovery phase. Deaths by deliberate or accidental overdose have occurred with tricyclic antidepressants.

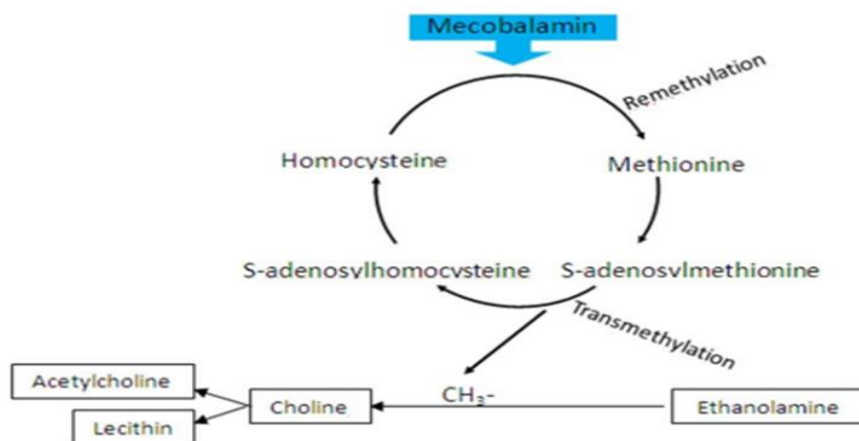
## **5. Pharmacological properties**

### **5.1 Mechanism of action**

Antidepressant effect of Amitriptyline is due to inhibition of reuptake of Serotonin and Norepinephrine by neuronal membranes. Earlier it was believed that the same was responsible for its analgesic action. But now it has been demonstrated due to: – Sodium channel blockade similar to local anaesthetic. – Blockade of Serotonin Receptors - 5-HT<sub>2A</sub>, 5-HT<sub>2C</sub>, 5-HT<sub>3</sub>, 5-HT<sub>6</sub> & 5-HT<sub>7</sub> – Inhibition of Nicotinic Acetylcholine Receptors

Mecobalamin –

- Enhances synthesis of proteins in nerve cells
- promotes myelinization
- axonal regeneration
- Helps in generation of enzyme methionine synthase - regeneration of methionine from homocysteine.
- Restores diminished neurotransmitter (Acetylcholine) levels.



## 5.2 Pharmacodynamic properties

Amitriptyline, a tertiary amine tricyclic antidepressant, is structurally related to both the skeletal muscle relaxant cyclobenzaprine and the thioxanthene antipsychotics such as thiothixene. It is extremely sedating, and thus improvement of sleep patterns can be the first benefit of treatment. Amitriptyline exhibits strong anticholinergic activity, cardiovascular effects including orthostatic hypotension, changes in heart rhythm and conduction, and a lowering of the seizure threshold. As with other antidepressants, several weeks of therapy may be required in order to realize the full clinical benefit of amitriptyline. Although not a labelled indication, amitriptyline is widely used in the management of chronic non-malignant pain (e.g., post-herpetic neuralgia, fibromyalgia).

Mecobalamin as a coenzyme of methionine synthetase, mecobalamin plays an important role in transmethylation in the synthesis of methionine from homocysteine. Mecobalamin is well transported to nerve cell organelles, and promotes nucleic acid and protein synthesis.



Experiments in rats show that mecobalamin is better transported to nerve cell organelles than cyanocobalamin and promotes nucleic acid and protein synthesis more than cobamamide does. Experiments with cells from the brain origin and spinal nerve cells in rats also show mecobalamin to be involved in the synthesis of thymidine from deoxyuridine, promotion of deposited folic acid utilization and metabolism of nucleic acid. It promotes axonal transport and axonal regeneration. It exhibits neuropathologically and electrophysiologically inhibitory effects on nerve degeneration in neuropathies induced by drugs, such as adriamycin, acrylamide, and vincristine (in rats and rabbits), models of axonal degeneration in mice and neuropathies in rats with spontaneous diabetes mellitus. It promotes the synthesis of lecithin which is the main constituent of medullary sheath lipid. It also increases myelination of neurons in rat tissue culture more than cobamamide does. It restores delayed synaptic transmission and diminished neurotransmitters back to normal.

### **5.3 Pharmacokinetic properties**

Amitriptyline is readily absorbed from the gastrointestinal tract, peak plasma concentrations occurring within about 6 hours after oral doses. Amitriptyline undergoes extensive first-pass metabolism and is demethylated in the liver by the cytochrome P450 isoenzymes CYP3A4, CYP2C9, and CYP2D6 to its primary active metabolite, nortriptyline. Other paths of metabolism of amitriptyline include hydroxylation (possibly to active metabolites) by CYP2D6 and N-oxidation; nortriptyline follows similar paths. Amitriptyline is excreted in the urine, mainly in the form of its metabolites, either free or in conjugated form. Amitriptyline and nortriptyline are widely distributed throughout the body and are extensively bound to plasma and tissue protein. Amitriptyline has been estimated to have an elimination half-life ranging from about 9 to 25 hours, which may be considerably extended in overdose. Plasma concentrations of amitriptyline and nortriptyline vary very widely between individuals and no simple correlation with therapeutic response has been established. Amitriptyline and nortriptyline cross the placenta and are distributed into breast milk.

Mecobalamin substances bind to intrinsic factor, a glycoprotein secreted by the gastric mucosa, and are then actively absorbed from the gastrointestinal tract. Absorption is impaired in patients with an absence of intrinsic factor, with a malabsorption syndrome or with disease or abnormality of the gut, or after gastrectomy. Absorption from the

gastrointestinal tract can also occur by passive diffusion; little of the vitamin present in food is absorbed in this manner although the process becomes increasingly important with larger amounts such as those used therapeutically. After intranasal dosage, peak plasma concentrations of cyanocobalamin have been reached in 1 to 2 hours. The bioavailability of the intranasal preparation is about 7 to 11% of that by intramuscular injection. Mecobalamin is extensively bound to specific plasma proteins called transcobalamins; transcobalamin II appears to be involved in the rapid transport of the cobalamins to tissues. Mecobalamin is stored in the liver, excreted in the bile, and undergoes extensive enterohepatic recycling; part of a dose is excreted in the urine, most of it in the first 8 hours; urinary excretion, however, accounts for only a small fraction in the reduction of total body stores acquired by dietary means. Mecobalamin diffuses across the placenta and also appears in breast milk.

## **6. Nonclinical properties**

### **6.1 Animal Toxicology or Pharmacology**

Not required.

## **7. Description**

### **Amitriptyline:**

Amitriptyline is a derivative of dibenzocycloheptadiene and a tricyclic antidepressant.

Chemical Name- dimethyl(3-{tricyclo[9.4.0.0<sup>3,8</sup>]pentadeca-1(15),3,5,7,11,13-hexaen-2-ylidene}propyl)amine

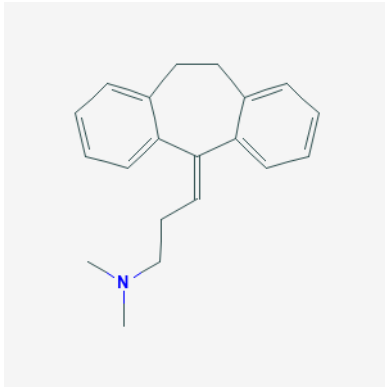
Molecular Weight- 277.4 g/mol

Molecular Formula- C<sub>23</sub>H<sub>20</sub>N

Structure-



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### Mecobalamin:

Cyanocobalamin is a cobalt-containing coordination compound generated by intestinal microbes, and a natural water-soluble vitamin of the B-complex family that must combine with Intrinsic Factor for absorption by the intestine.

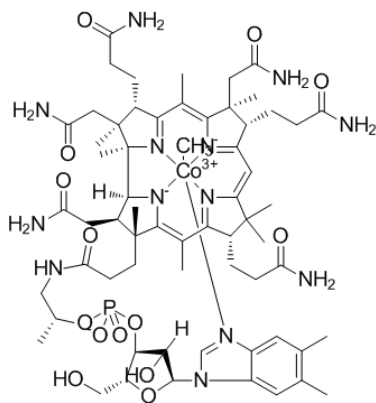
Chemical Name-

cobalt(3+);[(2R,5S)-5-(5,6-dimethylbenzimidazol-1-yl)-4-hydroxy-2-(hydroxymethyl)oxolan-3-yl] 1-[3-[(2R,3R,4Z,7S,9Z,12S,13S,14Z,17S,18S,19R)-2,13,18-tris(2-amino-2-oxoethyl)-7,12,17-tris(3-amino-3-oxopropyl)-3,5,8,8,13,15,18,19-octamethyl-2,7,12,17-tetrahydro-1H-corrin-21-id-3-yl]propanoylamino]propan-2-yl phosphate;cyanide

Molecular Weight- 1355.4 g/mol

Molecular Formula-  $C_{63}H_{88}CoN_{14}O_{14}P$

Structure-



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## **8. Pharmaceutical particulars**

### **8.1 Incompatibilities**

There are no known incompatibilities.

### **8.2 Shelf-life**

PVC blister packs- 4 years from the date of manufacture.

### **8.3 Packaging information**

AmNuring tablets are available in blister pack of 10 Tablets.

### **8.4 Storage and handling instructions**

Store below 25<sup>0</sup>C in a dry place. Protect from light. Keep away from children.

## **9. Patient Counselling Information**

### **9.1 Adverse Reactions**

Refer part 4.8

### **9.2 Drug Interactions**

Refer part 4.5

### **9.3 Dosage**

Refer part 4.2

### **9.4 Storage**

Refer part 8.4

### **9.5 Risk Factors**

Refer part 4.4

### **9.6 Self-monitoring information**



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NA

**9.7 Information on when to contact a health care provider or seek emergency help**

Patients are advised to be alert for the emergence or worsening of the adverse reactions and contact the prescribing physician.

**9.8 Contraindications**

Refer part 4.3

**10. Manufactured by THE MADRAS PHARMACEUTICALS**

**11. Details of permission or license number with date**

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**12. Date of revision: January 2021**



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