Phenelzine

**CAS Number**: 51-71-8
**Molecular Formula**: C8H12N2
**Molecular Weight**: 136.194 g/mol
**Systematic (IUPAC)**: (2-phenylethyl)hydrazine

**Type**: small molecule

**Description**: An irreversible non-selective inhibitor of monoamine oxidase. May be used to treat major depressive disorder.
**Categories**
Antidepressants
Antidepressive Agents
Monoamine Oxidase Inhibitors

**Taxonomy**

**Kingdom** : Organic

**Classes** : Phenethylamines

**Substructures**
Benzene and Derivatives
Phenethylamines
Aromatic compounds
Hydrazine Derivatives

**Pharmacology**

**Indication** : For the treatment of major depressive disorder. Has also been used with some success in the management of bulimia nervosa.

**Pharmacodynamics** : Phenelzine belongs to a class of antidepressants called monoamine oxidase inhibitors (MAOIs). MAO is an enzyme that catalyzes the oxidative deamination of a number of amines, including serotonin, norepinephrine, epinephrine, and dopamine. Two isoforms of MAO, A and B, are found in the body. MAO-A is mainly found within cells located in the periphery and catalyzes the breakdown of serotonin,
norepinephrine, epinephrine, dopamine and tyramine. MAO-B acts on phenylethylamine, norepinephrine, epinephrine, dopamine and tyramine, is localized extracellularly and is found predominantly in the brain. While the mechanism of MAOIs is still unclear, it is thought that they act by increasing free serotonin and norepinephrine concentrations and/or by altering the concentrations of other amines in the CNS. It has been postulated that depression is caused by low levels of serotonin and/or norepinephrine and that increasing serotonergic and norepinephrinergic neurotransmission results in relief of depressive symptoms. MAO A inhibition is thought to be more relevant to antidepressant activity than MAO B inhibition. Selective MAO B inhibitors, such as selegiline, have no antidepressant effects. Response to therapy generally occurs 2 - 4 weeks following onset though some patients may not experience symptom relief for up to 8 weeks.

**Mechanism of action**: Although the exact mechanism of action has not been determined, it appears that the irreversible, nonselective inhibition of MAO by phenelzine relieves depressive symptoms by causing an increase in the levels of serotonin, norepinephrine, and dopamine in the neuron.

**Absorption**: Readily absorbed after oral administration.

**Metabolism**: Hepatic. Acetylation of phenelzine appears to be a minor metabolic pathway. Beta-phenylethylamine is a metabolite of phenelzine, and
there is indirect evidence that phenelzine may also be ring-hydroxylated and N-methylated.

**Route of elimination**: Phenelzine is extensively metabolized, primarily by oxidation via monoamine oxidase.

**Half life**: 1.2-11.6 hours following single dose administration. Multiple-dose pharmacokinetics have not been studied.

**Toxicity**: Symptoms of overdose include drowsiness, dizziness, faintness, irritability, hyperactivity, agitation, severe headache, hallucinations, trismus, opisthotonos, convulsions and coma, rapid and irregular pulse, hypertension, hypotension and vascular collapse, precordial pain, respiratory depression and failure, hyperpyrexia, diaphoresis, and cool, clammy skin. Hypertensive crisis may occur with the ingestion of tyramine-rich foods such as cured meats, poultry or fish, aged cheeses, concentrated soy products, tap beer and wine, yeast extracts, broad bean pods and fava beans and sauerkraut.

**Affected organisms**: Humans and other mammals

**Why is this medication prescribed?**
Phenelzine is used to treat depression in people who have not been helped by other medications. Phenelzine is in a class of medications called monoamine oxidase inhibitors (MAOIs). It works by increasing the amounts
of certain natural substances that are needed to maintain mental balance.

How should this medicine be used?
Phenelzine comes as a tablet to take by mouth. It is usually taken three times a day. Follow the directions on your prescription label carefully, and ask your doctor or pharmacist to explain any part you do not understand. Take phenelzine exactly as directed. Do not take more or less of it or take it more often than prescribed by your doctor.

Your doctor will probably start you on a low dose of phenelzine and gradually increase your dose. After your symptoms have improved, your doctor will probably gradually decrease your dose. Follow these directions carefully.

Phenelzine controls the symptoms of depression but does not cure the condition. It may take 4 weeks or longer for you to feel the full benefit of phenelzine. Continue to take phenelzine even if you feel well. Do not stop taking phenelzine without talking to your doctor. Your doctor probably will want to decrease your dose gradually. If you suddenly stop taking phenelzine, you may experience withdrawal symptoms such as nightmares, agitation, loss of contact with reality, nausea, vomiting, and weakness.

Other uses for this medicine
This medication may be prescribed for other uses; ask your doctor or pharmacist for more information.

What special precautions should I follow?
Before taking phenelzine,
tell your doctor and pharmacist if you are allergic to phenelzine or any other medications.
tell your doctor if you are taking, have recently taken, or plan to take any of the following prescription and non-prescription medications: certain other antidepressants including amitriptyline (Elavil), amoxapine, clomipramine (Anafranil), desipramine (Norpramin), doxepin (Sinequan), imipramine (Tofranil), maprotiline, mirtazapine (Remeron), nortriptyline (Pamelor), protriptyline (Vivactil), and trimipramine (Surmontil); amphetamines such as amphetamine (in Adderall), benzphetamine (Didrex), dextroamphetamine (Dexedrine, Dextrostat, in Adderall), and methamphetamine (Desoxyn); bupropion (Wellbutrin, Zyban); buspirone (BuSpar); caffeine (No-Doz, Quick-Pep, Vivarin); cyclobenzaprine (Flexeril); dextfenfluramine (Redux) (not available in the U.S.); dextromethorphan (Robitussin, others); duloxetine (Cymbalta); epinephrine (Epipen, Primatene Mist); guanethidine (Ismelin) (not available in the U.S.); levodopa (Larodopa, in Sinemet); medications for allergies, cough and cold symptoms, hay fever; anxiety, sinus problems, or weight loss (diet pills, appetite suppressants); medications for seizures such as carbamazepine (Tegretol); narcotic medications for pain; nasal decongestants, including nose drops and sprays; other MAOIs such as isocarboxazid (Marplan); pargyline (not available in the U.S.), procarbazine (Matulane), tranylcypromine (Parnate), and selegiline (Eldepryl, Emsam, Zelapar); meperidine (Demerol); methyldopa (Aldomet); 'pep pills'; sedatives; selective serotonin reuptake inhibitors such as citalopram (Celexa), escitalopram (Lexapro), fluoxetine (Prozac), fluvoxamine (Luvox), paroxetine (Paxil), and sertraline
(Zoloft); sleeping pills; tranquilizers; venlafaxine (Effexor); and medications containing alcohol (Nyquil, elixirs, others). Your doctor may tell you not to take phenelzine if you are taking or have recently stopped taking one or more of these medications.

tell your doctor and pharmacist what other prescription and nonprescription medications, vitamins, and herbal products you are taking or plan to take. Be sure to mention any of the following: barbiturates such as pentobarbital (Nembutal), phenobarbital (Luminal), and secobarbital (Seconal); beta blockers such as atenolol (Tenormin), labetalol (Normodyne), metoprolol (Lopressor, Toprol XL), nadolol (Corgard), and propranolol (Inderal); doxepin cream (Zonelon), insulin and oral medications for diabetes; and medication for high blood pressure including diuretics ('water pills'), and reserpine (Serpalan). Your doctor may need to change the doses of your medications and monitor you carefully for side effects.

you should know that phenelzine may remain in your body for several weeks after you stop taking the medication. During the first few weeks after your treatment ends, tell your doctor and pharmacist that you have recently stopped taking phenelzine before you start taking any new medications.

tell your doctor if you are taking any nutritional supplements, especially phenylalanine (DLPA)(contained in aspartame sweetened products such as diet sodas and foods, over-the-counter medications, and some prescription medications), rauwolfia, tyrosine, or tryptophan.

tell your doctor if you have or have ever had pheochromocytoma (a tumor on a small gland near the
kidneys) or heart or liver disease. Your doctor may tell you not to take phenelzine.

tell your doctor if you use street drugs. Also tell your doctor if you have or have ever had high blood pressure; diabetes; seizures; schizophrenia (a mental illness that causes disturbed thinking, loss of interest in life, and strong or unusual emotions); agitation; or hyperactivity or other movement disorders.

tell your doctor if you are pregnant, plan to become pregnant, or are breast-feeding. If you become pregnant while taking phenelzine, call your doctor.

if you are having surgery, including dental surgery, tell the doctor or dentist that you are taking phenelzine.
you should know that this medication may make you drowsy. Do not drive a car or operate machinery until you know how this medication affects you.
do not drink alcohol while you are taking phenelzine. Alcohol can make the side effects of phenelzine worse.
you should know that phenelzine may cause dizziness, lightheadedness, and fainting when you get up too quickly from a lying position. This is more common when you first start taking phenelzine. To avoid this problem, get out of bed slowly, resting your feet on the floor for a few minutes before standing up.

What special dietary instructions should I follow?

You may experience a serious reaction if you eat foods that are high in tyramine during your treatment with phenelzine. Tyramine is found in many foods, including meat, poultry, fish, or cheese that has been smoked, aged, improperly stored, or spoiled; certain fruits, vegetables, and beans; alcoholic beverages; and yeast
products that have fermented. Your doctor or dietitian will tell you which foods you must avoid completely, and which foods you may eat in small amounts. You should also avoid foods and drinks that contain caffeine during your treatment with phenelzine. Follow these directions carefully. Ask your doctor or dietitian if you have any questions about what you may eat and drink during your treatment.

What should I do if I forget a dose?
Take the missed dose as soon as you remember it. However, if it is almost time for your next dose, skip the missed dose and continue your regular dosing schedule. Do not take a double dose to make up for a missed one.

What side effects can this medication cause?
Phenelzine may cause side effects. Tell your doctor if any of the following symptoms are severe or do not go away:
- drowsiness
- weakness
- dizziness
- dry mouth
- constipation
- weight gain
- decreased sexual ability
- uncontrollable shaking of any part of the body
- muscle twitching or jerking

Some side effects can be serious. If you experience any of the following symptoms or those listed in the IMPORTANT WARNING section, call your doctor immediately:
- headache
- slow, fast, or pounding heartbeat
neck stiffness or soreness
chest pain
nausea
vomiting
sweating
wide pupils (black circles in the middle of the eyes)
eyes more sensitive to light than usual
swelling of face, throat, arms, hands, feet, ankles, or lower legs
difficulty breathing or swallowing
yellowing of the skin or eyes
Phenelzine may cause other side effects. Call your doctor if you experience any unusual problems while you are taking this medication.

What storage conditions are needed for this medicine?
Keep this medication in the container it came in, tightly closed, and out of reach of children. Store it at room temperature and away from excess heat and moisture (not in the bathroom). Throw away any medication that is outdated or no longer needed. Talk to your pharmacist about the proper disposal of your medication.

Symptoms of overdose may include:
drowsiness
dizziness
faintness
irritability
hyperactivity
agitation
headache
hallucinations (seeing things or hearing voices that do not exist)
tightening of the jaw
stiffly arched back
seizures
coma (loss of consciousness for a period of time)
fast, irregular pulse
chest pain
slowed breathing
fever
sweating
cool, clammy skin

What other information should I know?
Keep all appointments with your doctor and the laboratory. Your doctor will check your blood pressure regularly during your treatment with phenelzine. Do not let anyone else take your medication. Ask your pharmacist any questions you have about refilling your prescription.
It is important for you to keep a written list of all of the prescription and nonprescription (over-the-counter) medicines you are taking, as well as any products such as vitamins, minerals, or other dietary supplements. You should bring this list with you each time you visit a doctor or if you are admitted to a hospital. It is also important information to carry with you in case of emergencies.

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