# Benkinson™

Levodopa & Benserazide Capsule

**Presentation**
Benkinson™ 62.5: Each capsule contains Levodopa BP 50 mg and Benserazide Hydrochloride BP equivalent to Benserazide 12.5 mg.
Benkinson™ 125: Each capsule contains Levodopa BP 100 mg and Benserazide Hydrochloride BP equivalent to Benserazide 25 mg.
Benkinson™ 250: Each capsule contains Levodopa BP 200 mg and Benserazide Hydrochloride BP equivalent to Benserazide 50 mg.
Benkinson™ CR 125: Each controlled release capsule contains Levodopa BP 100 mg and Benserazide Hydrochloride BP equivalent to Benserazide 25 mg.

**Description**
Levodopa-Benserazide capsule is an anti-Parkinson's agent. Levodopa (dopamine precursor) is used as a prodrug to increase dopamine levels since it is able to cross the blood brain barrier whereas dopamine itself cannot. Once levodopa has entered the central nervous system, it is metabolized to dopamine by aromatic L-amino acid decarboxylase. After administration, levodopa is rapidly decarboxylases to dopamine in extra-cerebral as well as cerebral tissues. As a result, most of the levodopa administered is not available to the basal ganglia and the dopamine produced peripherally frequently causes unwanted side effects. It is therefore particularly desirable to inhibit extra-cerebral decarboxylation of levodopa. This can be achieved by simultaneous administration of levodopa-benserazide capsule, a peripheral decarboxylase inhibitor. Levodopa- benserazide capsule is a combination of these two substances in a ratio of 4:1 - this ratio having proved optimal in clinical trials and therapeutic use - and is just as effective as large doses of levodopa given alone.

**Indications and Usage**
Levodopa-Benserazide (immediate release capsule) is indicated for the treatment of all forms of Parkinson's syndrome with the exception of medicine-induced Parkinsonism. On the other hand, controlled release capsule indicated for patients presenting with all types of motor fluctuations in response, especially those related to fluctuations in plasma levels (i.e. "peak dose dyskinesia" and "end of dose deterioration") and for better control of nocturnal symptoms.

**Dosage and Administration**

*For Immediate release capsule (IR):*

| ***Parkinson's disease*** | | | ***Initial dose*** | ***Maintenance*** |
|---|---|---|---|---|
| Patients not presently receiving levodopa | Early Stage | Elderly | Levodopa-Benserazide (50+12.5) 62.5 mg, 1-2 times/day | Gradually increase by Levodopa Benserazide (50+12.5) 62.5 mg daily, in every 3-4 days according to response. |
| | | Adult | Levodopa Benserazide (50+12.5) 62.5 mg, 3-4 times/day | 1 capsule of Levodopa-Benserazide (100+25) 125 mg 3 to 6 times/day |
| | Advance stage | | Levodopa-Benserazide (100+25) 125 mg, 3 times/day | |
| Patients previously on levodopa monotherapy | Initiate with 10-15% of the usual dose previously taken | | | |
| Patient previously on other levodopa/dopadecarboxylase combination therapy | Withdraw previous therapy for 12 hour before initiating therapy at Levodopa-Benserazide (50+12.5) 62.5 mg, 3 or 4 times daily | | | |

*For Controlled release capsule (CR):*

| ***Parkinson's disease with motor fluctuation*** | ***Initial dose*** | ***Maximum dose*** |
|---|---|---|
| Patients not presently receiving levodopa | 1 capsule of Levodopa-Benserazide (100+25) 125 mg controlled release capsule, 3 times/day | 6 capsules/day |
| Patients previously on levodopa-Benserazide immediate release preperation | Initially dose should substitute every 100 mg of Levodopa with 1 controlled-release cap, given at same dosage frequency as before. Increase every 2-3 days according to response. | |

*Patients with renal impairment:* No dose reduction of Levodopa-Benserazide is considered necessary in case of mild or moderate renal insufficiency.
*Patients with hepatic impairment:* The safety and efficacy of Levodopa-Benserazide have not been established in patients with hepatic impairment.

**Side-effects**
Anxiety, appetite decreased, arrhythmia, depression, diarrhea, hallucination, movement disorders, nausea, postural hypotension, sleep disorders, altered taste, vomiting, leucopenia etc.

**Precaution**
Cushing's syndrome, diabetes mellitus, endocrine disorders, history of convulsions, history of myocardial infarction with residual arrhythmia, history of peptic ulcer, hyperthyroidism, osteomalacia, pheochromocytoma, psychiatric illness, severe cardiovascular disease, severe pulmonary disease, susceptibility to angle-closure glaucoma.

**Contraindications**
This combination is contraindicated in patients with -known hypersensitivity to levodopa-benserazide or any of the excipients, patients receiving non-selective monoamine oxidase (MAO) Inhibitors due to the risk of hypertensive crisis. However, selective MAO-B inhibitors, such as selegiline and rasagiline, or selective MAO-A inhibitors, such as moclobemide, are not contraindicated. Patients with decompensated endocrine, renal or hepatic function, cardiac disorders, psychiatric diseases with a psychotic component or dosed angle glaucoma. Because levodopa may activate a malignant melanoma, this combination should not be used in patients with suspicious, undiagnosed lesions or a history of melanoma. The management of patients with intention tremor and Huntington's chorea. Patients less than 30 years old (skeletal development must be complete).

**Use in Pregnancy & Lactation**

***Pregnancy:*** Pregnancy - Category $B_3$. Levodopa-Benserazide capsule is contraindicated during pregnancy and in women of childbearing potential in the absence of adequate contraception. If pregnancy occurs in a woman taking Levodopa-Benserazide capsule, the medicine must be discontinued.

***Lactation:*** The safe use of Levodopa-Benserazide capsule during lactation has not been established.

**Use in Children**
Levodopa-Benserazide capsule is contraindicated in patients less than 30 years old.

**Drug Interactions**
Neuroleptics, opioids and antihypertensive medications containing reserpine inhibit the action of levodopa and benserazide capsule. It should not be administered concomitantly with sympathomimetic (agents such as adrenaline, noradrenaline, isoproterenolor amphetamine which stimulate the sympathetic nervous system) as levodopa may potentiate their effects. Should concomitant administration levodopa- benserazide capsule prove necessary, dose surveillance of the cardiovascular system is essential and the dose of the sympathomimetic agents may need to be reduced. Concomitant administration of antipsychotics with dopamine-receptor blocking properties, particularly D2-receptor antagonists might antagonize the antiparkinsonian effects of levodopa-benserazide capsule. Levodopa-benserazide capsule should be discontinued 12-48 hours before surgical intervention requiring general anesthesia with halothane as fluctuations in blood pressure and/or arrhythmias may occur.

**Overdosage**
Monitor the patient's vital signs and institute supportive measures as indicated by the patient's clinical state. In particular patients may require symptomatic treatment for cardiovascular effects (e.g. anti-arrhythmics) or central nervous system effects (e.g. respiratory stimulants, neuroleptics). In addition, for the controlled release formulation further absorption should be prevented using an appropriate method.

**Storage**
Do not store above 30 °C. Keep away from light and out of the reach of children.

**Commercial pack**
Benkinson™ 62.5: Each box containing 3 blister strips of 10 capsules.
Benkinson™ 125: Each box containing 3 blister strips of 10 capsules.
Benkinson™ 250: Each box containing 2 blister strips of 10 capsules.
Benkinson™ CR 125: Each box containing 2 blister strips of 10 capsule.

Manufactured by
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