

Exubera® (recombinant human insulin (rDNA))

Pharmacology

Rapid-acting insulin administered by the lungs using a special inhaler.

Indications

Indicated for use in Type 1 diabetes in conjunction with long-acting insulin and for use in Type 2 diabetes with or without oral agents or long-acting insulin.

Contraindications

Should not be used in patients with poor lung function (baseline FEV1 <70% predicted) as absorption may be erratic (risk of hypo or hyperglycemia). Smokers are at risk of hypoglycemia due to increased bioavailability of Exubera.

Adverse Effects

- Hypoglycemia
- Cough
- Shortness of breath
- Sore throat
- Dry mouth
- May decrease lung function

Prescribing Guidelines

Body weight	Initial EXUBERA premeal dose
66-87 lb	1 mg per meal
88-132 lb	1 mg 1 mg per meal
133-176 lb	3 mg per meal
177-220 lb	3 mg 1 mg per meal
221-264 lb	3 mg 1 mg 1 mg per meal
265-308 lb	3 mg 3 mg per meal

Converting units to milligrams

Approximate SC regular insulin dose	EXUBERA dose (mg)
3 IU	1 mg
6 IU	2 mg
8 IU	3 mg
11 IU	4 mg
14 IU	5 mg
16 IU	6 mg

Patient Instructions

Overview of patient instructions*



Load blister
into the slot



Apply pressure
by squeezing
the handle shut



Release cloud
into the
chamber



Inhale
EXUBERA

Efficacy

The Cochrane Review “Inhaled insulin in diabetes mellitus”, based on five clinical trials, concluded that patients taking inhaled insulin before meals, together with injected basal insulin, maintained glycemic control comparable to that of patients taking multiple daily injections. The main benefits were patient satisfaction and improved quality of life. Long term pulmonary safety data is lacking and lower bioavailability of inhaled insulin results in higher dose requirements, thus it may not be a cost-effective alternative.

Safety

Two studies in T1DM comparing demonstrated a decline in CO diffusion capacity in the inhaled insulin group but without any clinical significance.¹ The change in diffusion capacity resolved within 2 weeks of discontinuation. No difference in diffusion capacity was seen in T2DM.¹

A slight decrease in FEV₁ was seen at 12 weeks, but there was no significant difference in any pulmonary parameters thereafter (36, 52 and 104 week of treatment and 24 and 52 weeks after discontinuation).¹ A meta-analysis determined that the decrease in FEV₁ was progressive over the first six months of treatment and then stabilized in studies of up to two years’ duration.² The initial decrease in FEV₁ appears to be reversible after discontinuation of therapy.³

Cost

Kit containing inhaler, chamber and 2 release units - \$176.89

Package of 90 1 mg doses - \$35.98

Package of 90 3 mg doses and 2 release units -\$94.92

Chamber \$27.79

Inhaler \$129.09

2 release units \$8.39

Drug Status

Approved for use in Canada.

Not currently listed in Saskatchewan Formulary.

Pfizer has decided to stop marketing Exubera due to financial considerations.

References

1. Mastrandrea, L.D.; Quattrin, T. Clinical evaluation of inhaled insulin. *Advanced Drug Delivery Reviews*.58(9-10):1061-1075.2006.
2. Ceglia, L.; Lau, J.; Pittas, A.G. Meta-Analysis: Efficacy and Safety of Inhaled Insulin Therapy in Adults with Diabetes Mellitus. *Annals of Internal Medicine*. 145(9):665-675. 2006.
3. Fabbri, L. Pulmonary safety of inhaled insulins: a review of the current data. *Current Medical Research and Opinion*. 22(3):21-28(8). 2006.
4. FDA news release Jan 2006
5. Royle P, Waugh N, McAuley L, McIntyre L, Thomas S. Inhaled insulin in diabetes mellitus. *Cochrane Database of Systematic Reviews* 2003, Issue 3. Art. No.: CD003890. DOI: 10.1002/14651858.CD003890.pub2
6. Pfizer Canada website: www.exubera.com