

# backgrounder

## About Ryzodeg® (insulin degludec/insulin aspart)

### What is Ryzodeg®?

- Ryzodeg® is a combination of two distinct insulin analogues (insulin degludec and insulin aspart in the ratio of 70% and 30%), making it the first combination of a basal insulin with an ultra-long duration of action and a well-established mealtime insulin in one pen for people with type 2 diabetes<sup>1-3</sup>.
- In a multinational trial in adults with type 2 diabetes who had previously used insulin, Ryzodeg® delivered twice daily at main meals offered a successful reduction in HbA<sub>1c</sub> with a lower risk of hypoglycaemia versus NovoMix® 30 (biphasic insulin aspart 30), specifically<sup>3</sup>:
  - 32% significant lower risk of overall confirmed hypoglycaemia
  - 73% significant lower risk of nocturnal confirmed hypoglycaemia.
- Ryzodeg® delivered twice daily at main meals provides a simple regimen with fewer injections than basal and bolus therapy.

### Mechanism of protraction

- Insulin degludec is the first basal insulin that can be combined in a soluble solution with a mealtime insulin such that both insulin molecules remain structurally separate<sup>2,4</sup>.
- In the Ryzodeg® co-formulation, insulin degludec is present as soluble and stable di-hexamers, each of which consists of two hexameric structures made up of six individual insulin monomers within a single hexamer while insulin aspart is present as hexamers<sup>4</sup>.

### Who is Ryzodeg® for?

- Ryzodeg® is licensed for use for adults with type 1 and 2 diabetes<sup>1</sup> but is foreseen to be mostly used for people with type 2 diabetes.
- Ryzodeg® is an alternative to separate basal and bolus injections and premix insulin.
- Ryzodeg® is a simple insulin intensification option for people who need mealtime insulin coverage in addition to basal insulin.

### How is Ryzodeg<sup>®</sup> administered?

- In the EU, Ryzodeg<sup>®</sup> can be administered once or twice daily with the main meal(s)<sup>1</sup>.
- In Japan, Ryzodeg<sup>®</sup> can be administered once daily just before the large meal, the same meal every day or twice daily just before breakfast and dinner<sup>5</sup>.
- Ryzodeg<sup>®</sup> is delivered in FlexTouch<sup>®</sup>, the *only* prefilled pen with an easy touch button<sup>6</sup> and in Penfill<sup>®</sup> (insulin cartridges) that are designed to be used with Novo Nordisk insulin delivery systems<sup>1</sup>.

### Regulatory status

- Ryzodeg<sup>®</sup> has been approved in Aruba, Brazil, Chile, Costa Rica, El Salvador, the European Union, Hong Kong, Iceland, India, Israel, Japan, Kazakhstan, Macedonia, Mexico, Norway, Russia, South Korea and Switzerland.

### Clinical trial programme

- The clinical trial programmes for insulin degludec (BEGIN<sup>®</sup>) and Ryzodeg<sup>®</sup> (BOOST<sup>®</sup>) comprise the largest in the field of insulin therapy, with more than 11,000 people included. Novo Nordisk completed the phase 3a BOOST<sup>®</sup> programme in 2010. This programme consisted of six randomised, controlled, treat-to-target trials in more than 30 countries. More than 2000 people were included in the development programme. The programme was designed after consultancy with regulatory agencies in Europe, Japan and USA.

### References

1. Ryzodeg<sup>®</sup> Summary of Product Characteristics (SPC). Bagsværd, Denmark, Novo Nordisk A/S; February 2014.
2. De Rycke A, *et al.* Degludec – first of a new generation of insulins. *Eur Endocrinol.* 2011;7:84-7.
3. Fulcher G, *et al.* Comparison of insulin degludec/insulin aspart and biphasic insulin aspart 30 in uncontrolled, insulin-treated type 2 diabetes: a phase 3a, randomized, treat-to-target trial. *Diabetes Care.* 2014;37:2084-90.
4. Jonassen I, *et al.* Ultra-long acting insulin degludec can be combined with rapid-acting insulin aspart in a soluble co-formulation. *J Peptide Sci.* 2010;16(Suppl.1):32.
5. Ryzodeg<sup>®</sup> Japanese Product Information 2012.
6. Hemmingsen H, *et al.* A prefilled insulin pen with a novel injection mechanism and a lower injection force than other prefilled insulin pens. *Diabetes Technol Ther.* 2011;13:1207-11.