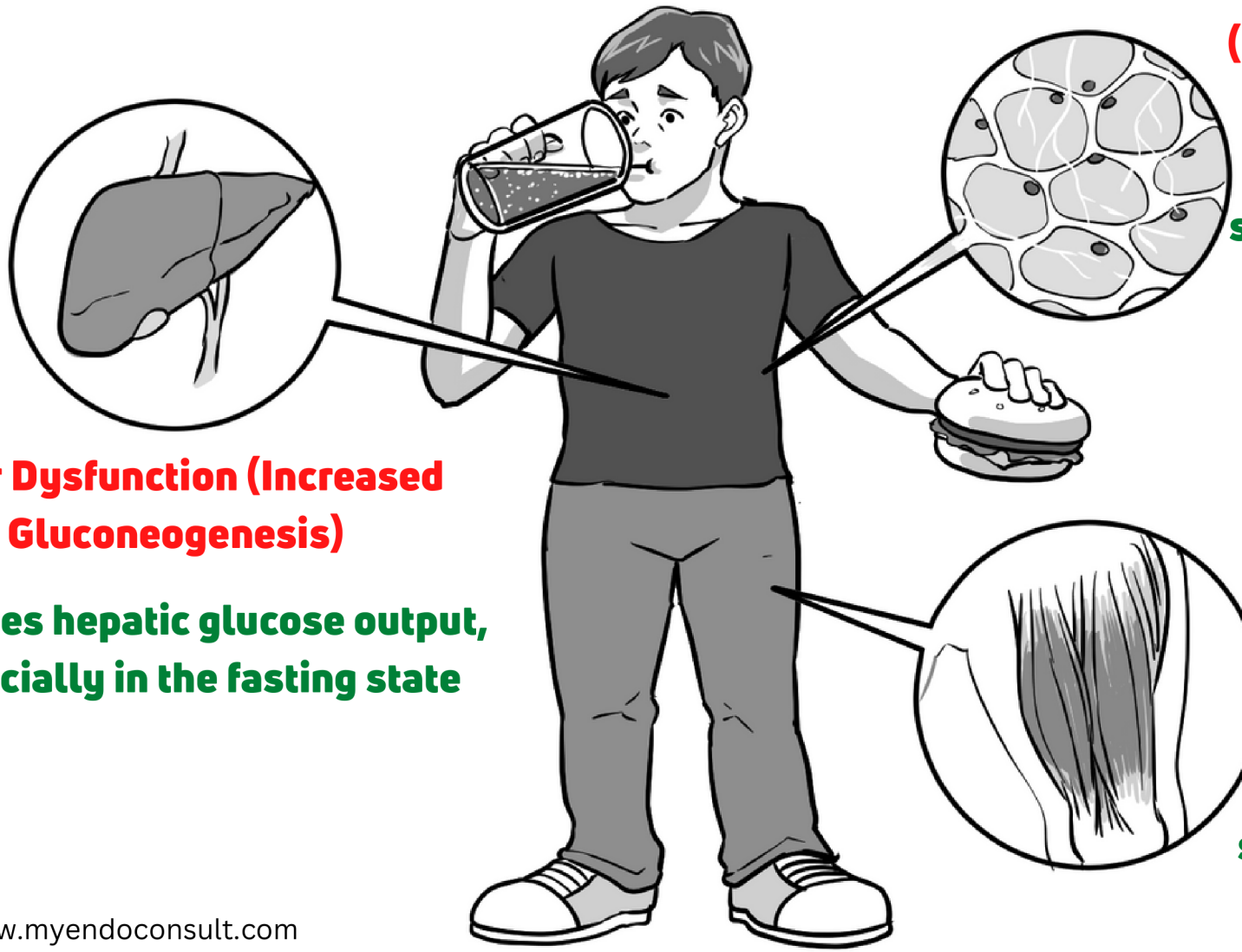
PATHOPHYSIOLOGIC DEFECTS IN T2DM

Mechanism of Action of Diabetes Drugs. Review of the **Ominous Octet (and egregious eleven)** of type 2 diabetes mellitus

METFORMIN (BIGUANIDES)



Increased Lipolysis (loss of anti-lipolytic action of insulin)

Improves insulin sensitivity in adipose tissue

Liver Dysfunction (Increased Gluconeogenesis)

Reduces hepatic glucose output, especially in the fasting state

Impaired translocation of GLUT-4 receptors (reduced glucose uptake)

Improves insulin sensitivity in skeletal muscle

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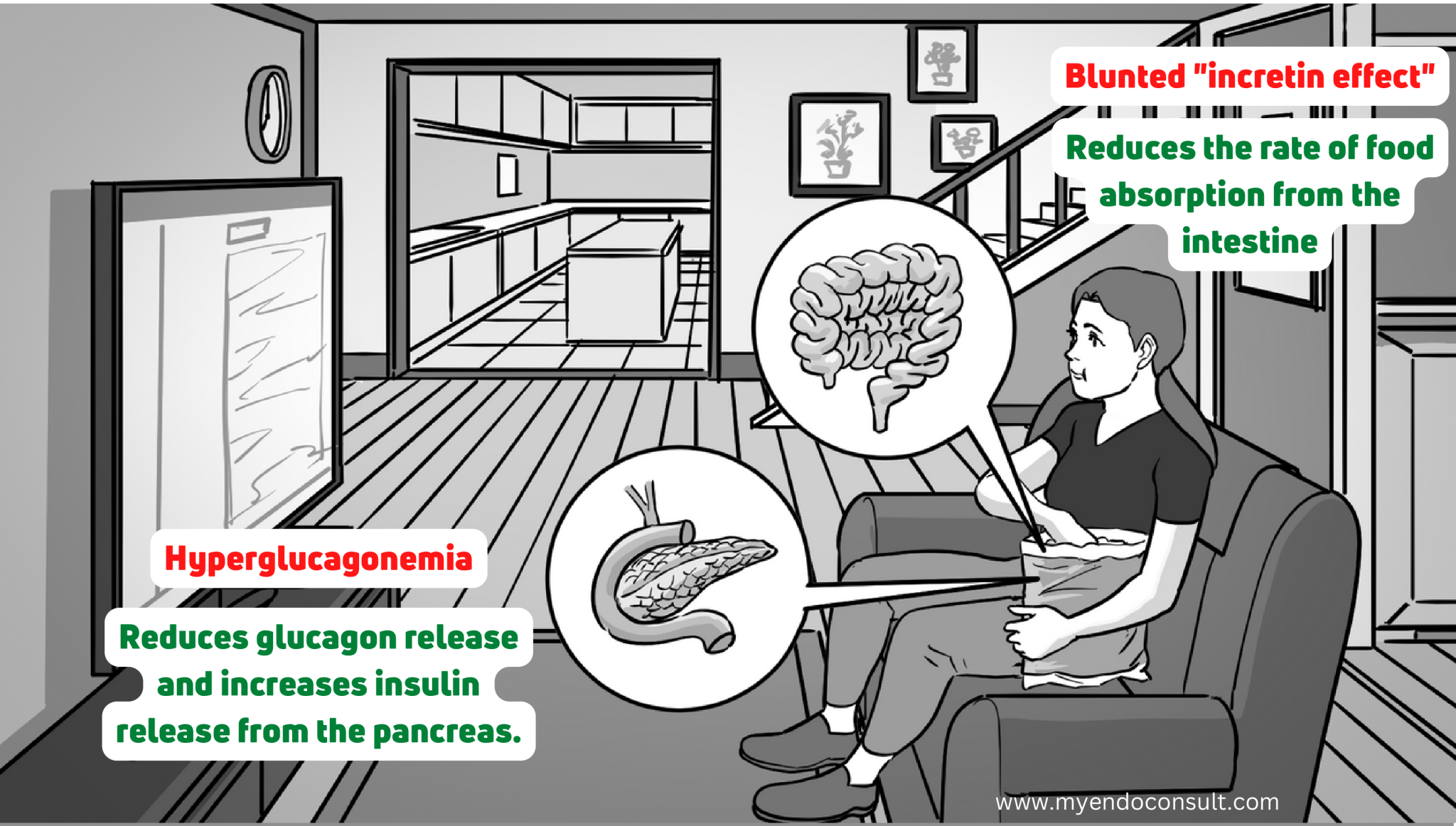
A biguanide reduces the amount of glucose released from the liver and also increases the sensitivity of cells (mainly muscle and fat) to insulin action.

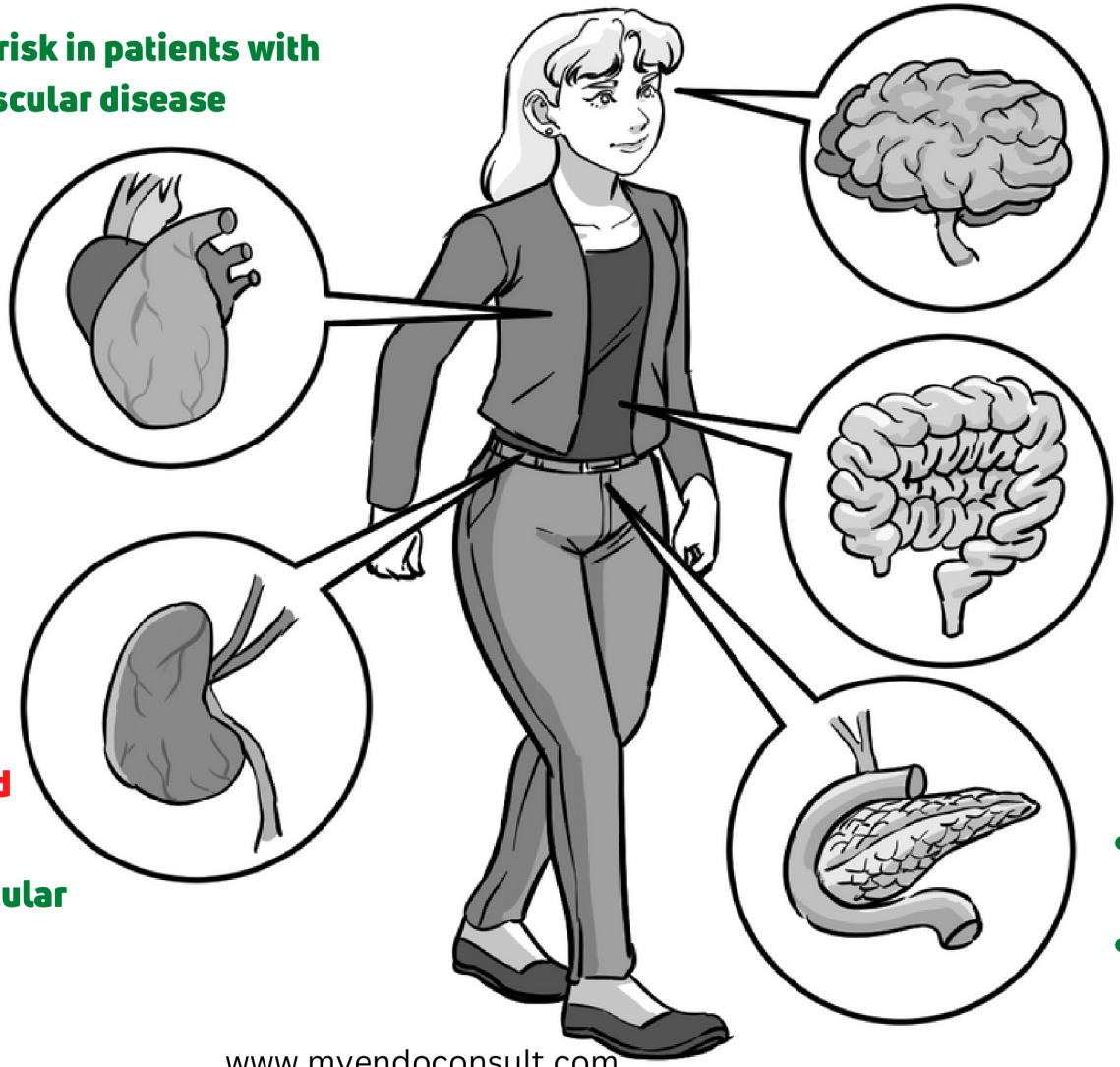
SITAGLIPTIN, LINAGLIPTIN (DPP4 inhibitors)



A DPP-4 inhibitor improves the body's ability to use insulin effectively.

LIRAGLUTIDE (GLP-1 AGONISTS)

Reduction in ASCVD risk in patients with established vascular disease



Neurotransmitter Defects

Early Satiety

Low Incretin (GLP-1 and GIP) activity

Slows down the absorption of carbohydrates

Increase in SGLT-2 and SGLT-1 activity

Renoprotection (vascular pathways)

Hyperglucagonemia

- **GLP-1 inhibits glucagon secretion.**
- **GIP promotes insulin secretion**

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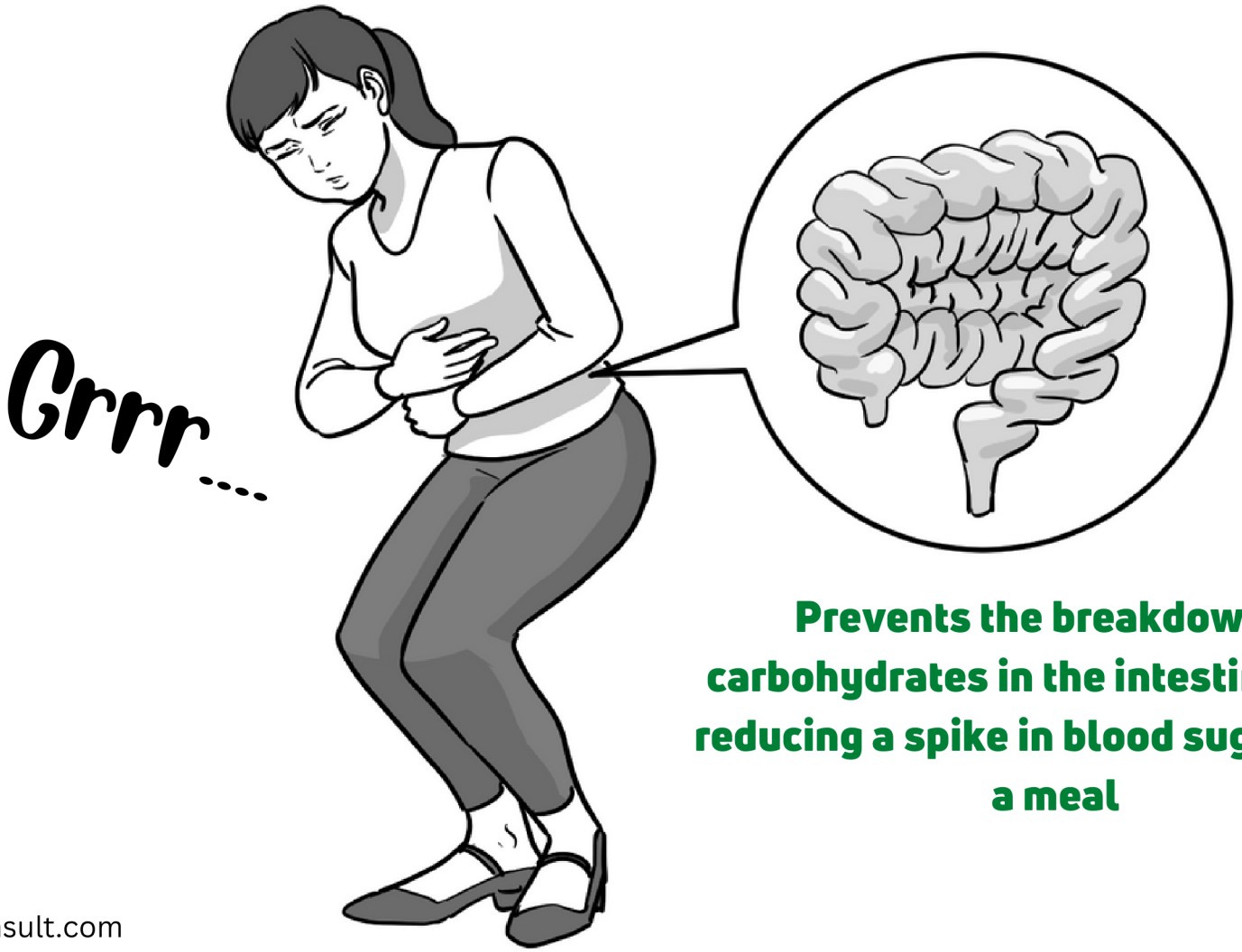
Glucagon-like peptide-1 (GLP-1) agonist is a hormone (specifically an incretin) released by the body in response to food intake.

ACARBOSE (ALPHA GLUCOSIDASE INHIBITOR)



Prevents the breakdown of carbohydrates in the intestine. Thus reducing a spike in blood sugars after a meal

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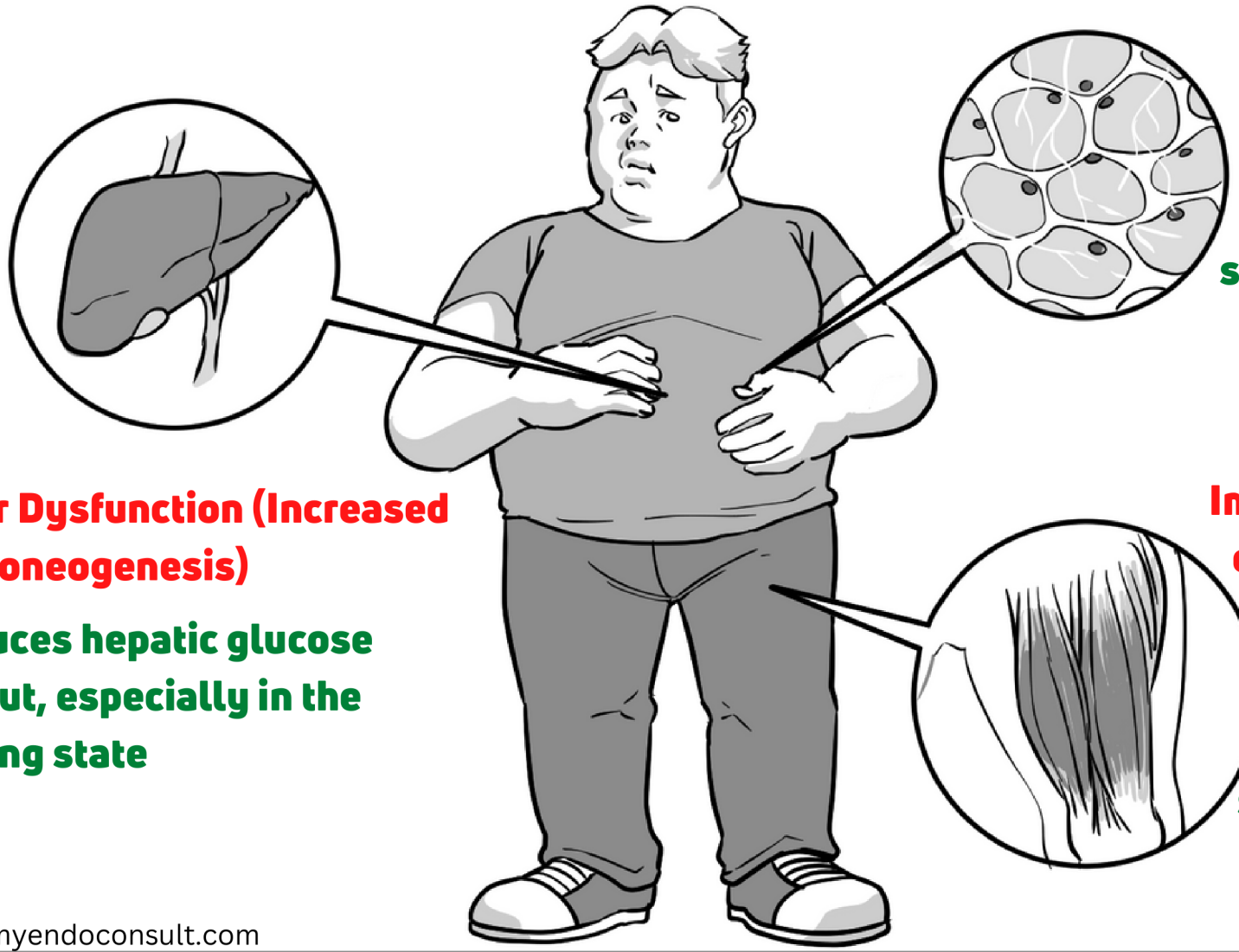
It blocks the enzyme alpha-glucosidase, which is responsible for breaking down carbohydrates in the intestines.

PIOGLITAZONE (THIAZOLIDINEDIONE)



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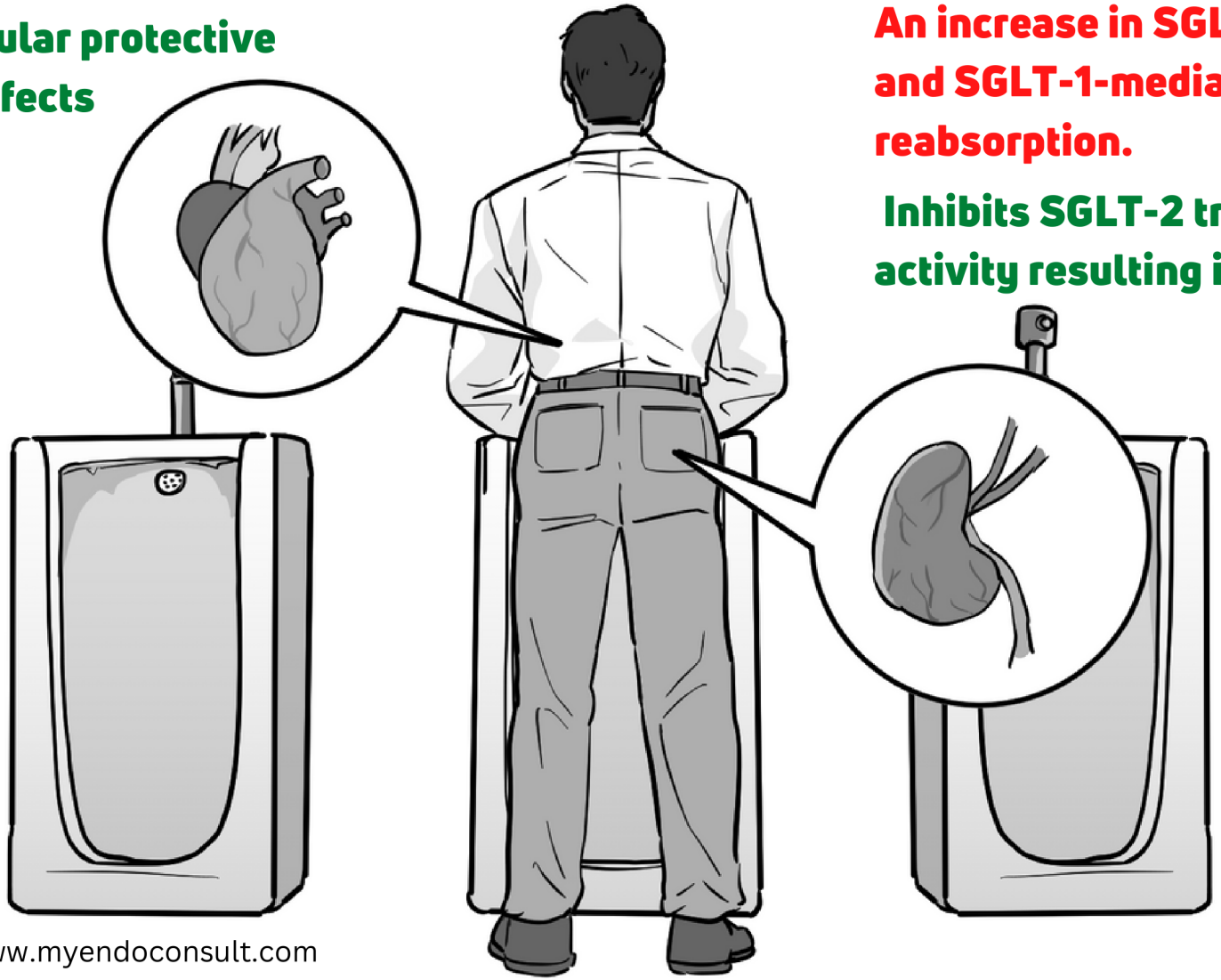
Thiazolidinedione improves the body's insulin sensitivity at various sites, including the liver, skeletal muscle and adipose tissue

EMPAGLIFLOZIN (SGLT-2 inhibitors)

Cardiovascular protective effects

An increase in SGLT-2 activity and SGLT-1-mediated glucose reabsorption.

Inhibits SGLT-2 transporter activity resulting in glycosuria



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SGLT-2 inhibitors work by blocking sodium-glucose transporters that reabsorb glucose in the proximal tubules of the kidneys, promoting glycosuria

INSULIN THERAPY

Long-acting insulin reduces the release of glucose from the liver

Lantus, Basaglar, Tresiba, Levemir, Toujeo...

Rapid-acting insulin reduces blood sugars after a meal

Novolog, Humalog, Fiasp, Admelog, Lyumjev

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Insulin facilitates the entry of glucose (a source of metabolic fuel) into various cells

PRAMLINTIDE (AMYLIN ANALOG)

- Slows the release of food from the stomach
- Reduces the release of glucagon after a meal
- Early Satiety

- Low levels of amylin (pancreas)

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Amylin is released in response to the carbohydrates you eat. In addition to helping control blood glucose levels, it also suppresses appetite and reduces feelings of hunger