

# DIGESTION, PERT AND DIABETES

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# Aims of this session

The Exocrine and Endocrine function of the pancreas

Pancreatic Exocrine Insufficiency (PEI) and Pancreatic Enzyme Replacement Therapy (PERT)- why it's so important

Type 3c diabetes

Digestion and diet

# Weight loss

72% of people with pancreatic cancer had unintentional weight loss within a year of diagnosis (Hue et al, 2020).

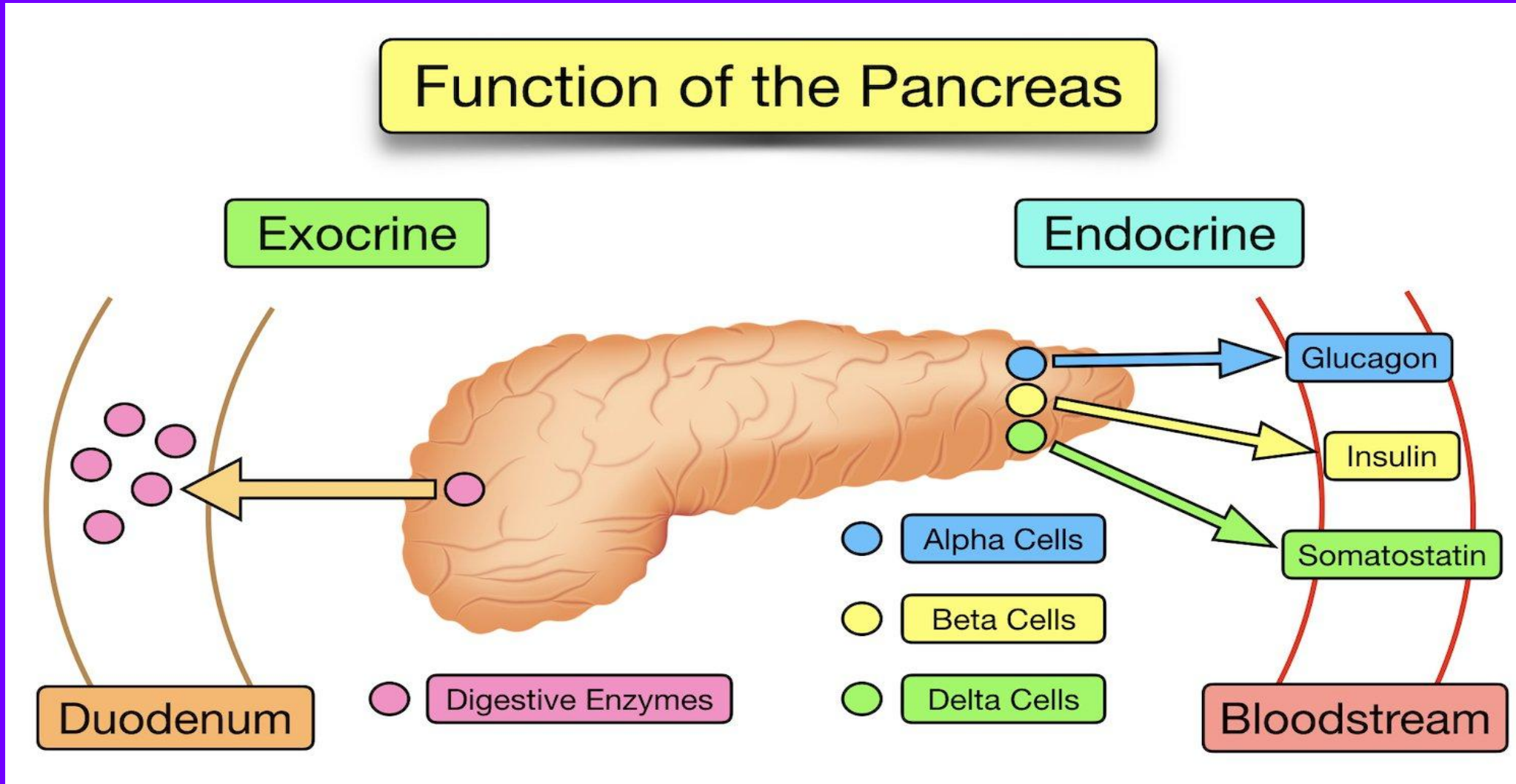
Malabsorption due to Pancreatic Exocrine Insufficiency (PEI)

New onset diabetes relating to pancreatic cancer.

Poor appetite is driven by pancreatic cancer treatments and symptoms.

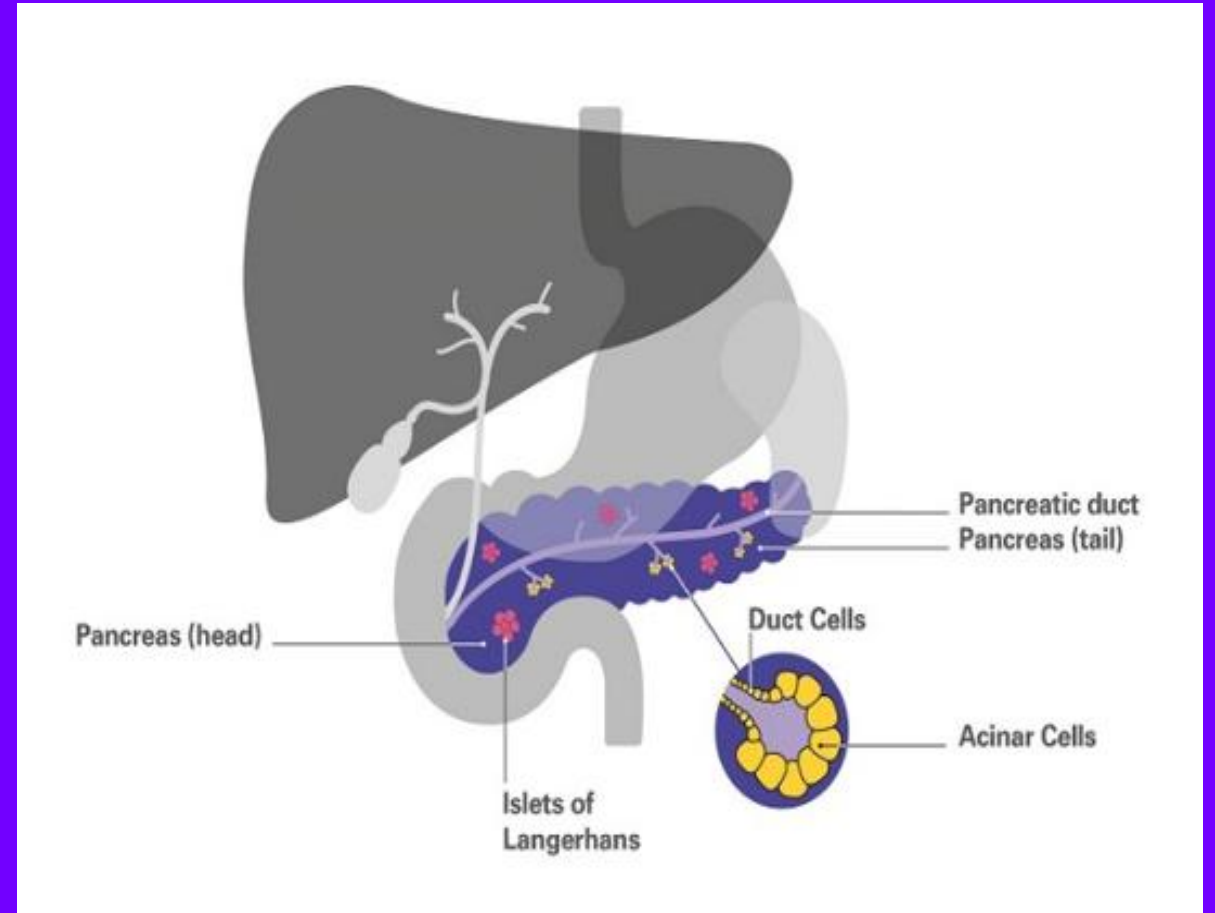
Increased nutritional requirements – 10% rise in energy expenditure due to tumour metabolism.

## A diagram showing the function of the pancreas



# Exocrine Function

- Pancreas plays a key role in digestion
- Exocrine activity accounts for approximately 85% of pancreas function
- Secretion of pancreatic juices that contain digestive enzymes, ions and water into the digestive tract
- Digestive enzymes; Lipase, Protease and Amylase



# Pancreatic Exocrine Insufficiency (PEI)

Exocrine pancreatic insufficiency occurs when the amount of enzymes released and transported to the small intestine is inadequate for proper food digestion and absorption of nutrients.

Present in most people with pancreatic cancer

66-94% of patients have PEI at first presentation (all comers)

Function deteriorates at approximately 10% per month. Function tests can take 2-6 weeks to give results

Incidence after surgery depends on the type of operation

Up to 98% head of pancreas (pancreatico-duodenectomy / Whipple)

# Symptoms of PEI

Weight loss, despite eating. Muscle wasting, especially around the upper torso and arms.

Pale stools which are difficult to flush, oily or greasy stools, or oil and grease scum on top of the toilet pan afterwards (Steatorrhea)

Some patients will describe loose stools, diarrhoea or large bulky stools. Also constipation!

Urgency to go to the toilet after eating, often with patients struggling to make the toilet in time. Very offensive and/or explosive stools or flatulence (or both).

Reflux, burping, bloating of the abdomen or abdominal cramps especially after a meal (i.e. 1-2hours)

Feeling of fullness, early satiety.

Nausea

Deficiency of micronutrients particularly fat soluble vitamins A, D, E, K

# Pancreatic Enzyme Replacement Therapy (PERT)

PERT helps to digest food by replacing the enzymes a healthy pancreas would produce to support digestion and absorption of micronutrients.

PERT is made from Porcine enzymes, important to discuss this with people who may not eat pork for health or religious reasons.

Dose very specific to the individual, no hard and fast rule.

GPs can be reluctant to do initial prescription of PERT, prefer to initiate via upper GI/HPB team this isn't necessary but understandable if unfamiliar with prescribing





# POLL

How confident do you feel advising your patients on how to take PERT?

Very confident

Quite confident

Not confident at all!

# PERT

Brands – Creon, Nutrizyme 22, Pancrex

Starting doses 50, 000 – 75 000 with main meals and 25, 000 – 50 000 units lipase with snacks and nutritious fluids.

Dose adjust - depending on the nutritional content of the meal or snack

Right time, right place, right pH and right temperature.

Foods and drinks which don't require PERT

Think pancreatic cancer Think pancreas failure Think PERT

Ongoing PERT shortage and use of imported versions such as Pangrol + Kreon

# Differential Diagnosis

## **Bile Acid Malabsorption (BAM)**

People with problems reabsorbing bile acid (bile acid malabsorption) have more bile than normal in the colon. This extra bile makes the colon release more water and speeds up the time it takes for waste to pass through the colon. This results in chronic watery diarrhoea.

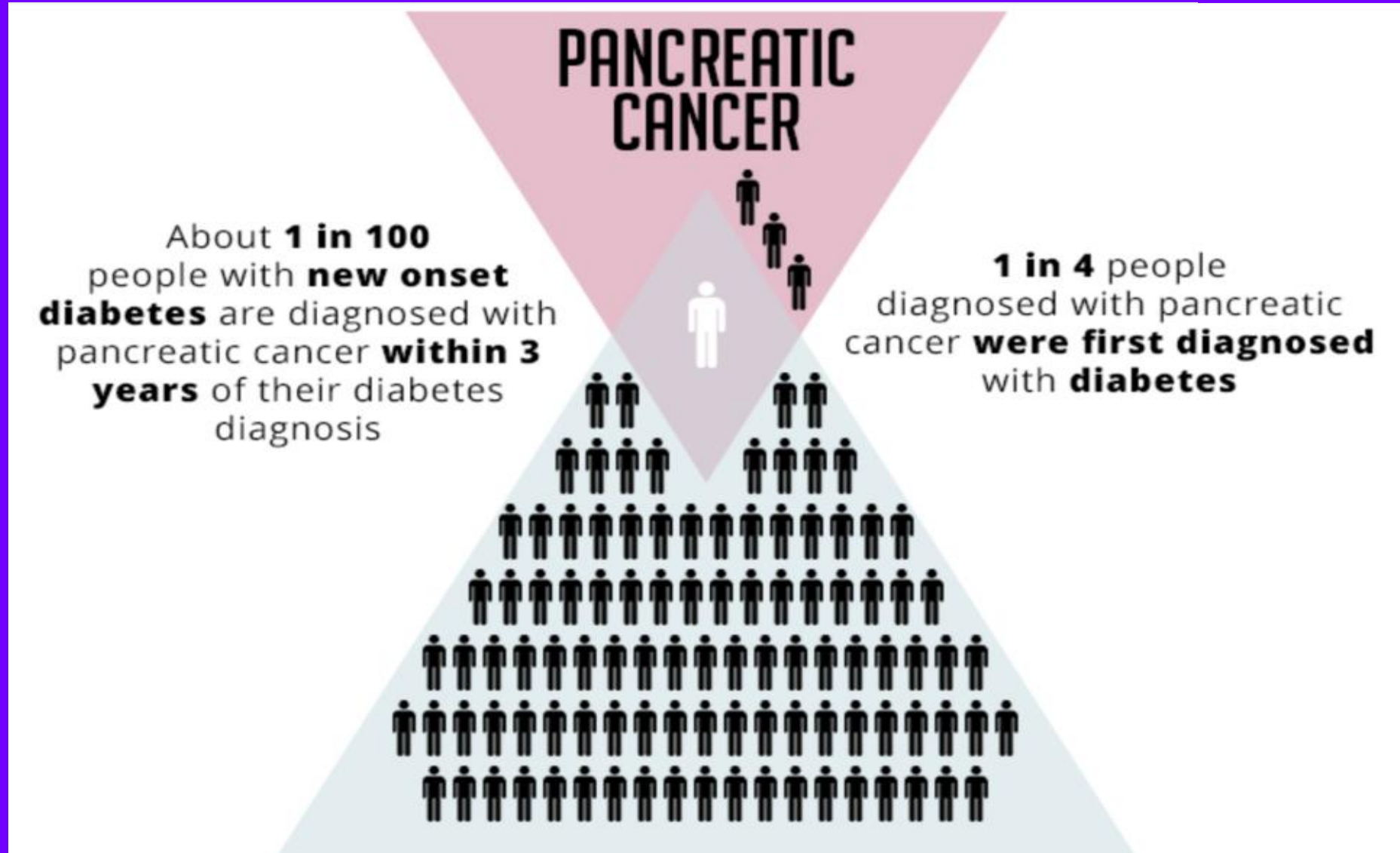
Patients with severe BAM can also experience steatorrhea.

Treatment-Bile acid sequestrants such as Colestyramine

## **Small Intestinal Bacterial Overgrowth (SIBO)**

Small intestinal bacterial overgrowth (SIBO) is the presence of excessive numbers of bacteria in the small bowel causing gastrointestinal symptoms such as bloating, chronic diarrhoea, weight loss, malabsorption, nutritional deficiencies, osteoporosis, and anaemia.

Treatment- antibiotics



Credit: National Cancer Institute

# Symptoms of diabetes

- Thirst
- Tiredness
- Weight loss
- Nocturia/polyurea
- Craving sugary drinks and foods
- Blurred vision
- Delayed wound healing
- Infections



# Type 3c Diabetes

Develops when there is damage to the pancreas 'pancreatogenic diabetes mellitus'

Often misdiagnosed as type 1 or 2.

People with type 3c produce less of all hormones, including insulin and glucagon

No universally accepted diagnostic criteria for type 3c diabetes

-Fasting glucose and HbA1c

Monitor blood glucose control across their treatment pathway (diagnosis, preoperative, postoperative, during chemo/radiotherapy, course of steroids, during palliative/best supportive care, end of life with discussion.

**Management**-Metformin. Most patients require insulin earlier

**Normal rules do not apply!** we prioritise nutrition and manage blood sugars accordingly.

# Dietary Guidance in Pancreatic Cancer

Loss of appetite is common.

## **Other symptoms will affect diet:**

taste changes, constipation, fear of eating due to side effects , anxiety and low mood, pain.

## **Practical tips for eating-:**

Little and often, softer foods, distraction eating, fortifying foods, plastic cutlery if metallic taste

Can be frustrating for family members, and cause stress for carers

Nutritional supplements (don't forget PERT!)

Specialist dietitian input (if available )

# Take home messages

Pancreatic cancer is complex, and time is of the essence

Emotional and Psychological support is as important as physical symptom management

**MOST** pancreatic cancer patients will have PEI and need PERT to treat this

PEI can cause significant physical symptoms which will improve with adequate PERT

Pain is changeable, common and ongoing assessment is important

Look out for type 3c diabetes, particularly in patients with tail of pancreas tumours.

Pancreatic Cancer UK has lots of information for Health professionals and you can call our support line if you have any questions 😊