Introduction to Pancreatic Enzyme Replacement Therapy (PERT) Guidance for GPs

(this flow chart is intended for use by healthcare professionals and may not be accessible to screen readers)

This document has been developed by Nottingham University Hospitals NHS Trust, Sherwood Forest Hospitals NHS Trust and the Integrated Care Board of Nottingham and Nottinghamshire to support General Practitioners (GPs) in managing the current shortage of Pancreatic Enzyme Replacement Therapy (PERT) medications. The shortage of these essential medications requires a strategic approach to ensure that patients continue to receive appropriate care without compromising their health outcomes. This shortage is likely to be ongoing into 2026.

The following flowcharts included in this document are designed to assist GPs in identifying whether their patients are high or low risk and outlining the necessary steps to manage these patients during the shortage of PERT. This document also helps to determine when a referral to the appropriate secondary specialist teams would be necessary.
The goal is to prioritise those most in need of PERT therapy and to make informed decisions in collaboration with the specialist teams where appropriate.

By following this guidance, GPs can ensure continuity of care for patients who rely on PERT and minimise disruptions during this period of limited availability.

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START POINT

If your patient is on PERT therapy
Please select which category your patient falls under.

HIGH RISK

- Paediatric Cystic Fibrosis – contact specialist hospital team
- Adult Cystic Fibrosis – contact specialist hospital team
- Patients <18 years under gastro / HPB team and on PERT – contact specialist hospital team

Adult Patients with:

- Total Pancreatectomy
- Pancreatic cancer patient awaiting surgery
- Pancreatic cancer patient who have had Whipples / PPPD (pancreatic duodenectomy)
- Pancreatic cancer undergoing chemotherapy
- Malnutrition (BMI 20 or below and unintentional weight loss).
- Those with extreme GI symptoms on reduction of taking PERT affecting quality of life, appetite and unintentional weight loss
  (e.g. bloating, abdominal pain on eating, loose / frequent / uncontrollable stools, weight loss, hypo's if diabetic)
- Patients taking somatostatin analogues for Neuroendocrine Tumour and Insulin Dependent Diabetes Mellitus (IDDM)
- Any patient who has had a transplant and on PERT Therapy
- Faecal elastase level <200 (excluding those Post Oesophagogastric (OG) surgery)
- OG surgery with symptoms of malabsorption and assessed by an Upper GI dietitian. +/- Faecal elastase result due to secondary insufficiency risk.

Follow Flow Chart 1

LOW RISK

Adult Patients (>18 years) with:

- Acute Pancreatitis. If 3 months since their last episode
- Distal Pancreatectomy. If started on PERT before any malabsorption symptoms occurred
- Acute necrotising pancreatitis where there is minimal nutritional risk (BMI >20 and no recent weight loss)
- Chronic pancreatitis where there is minimal nutritional risk (BMI >20 and no recent weight loss)

Follow Flow Chart 2

Note: If your patient's indication for PERT therapy is not highlighted, please refer to secondary care team (nuhnt.urgentpertnuh@nhs.net), treat as high risk and Follow Flow Chart 1

FLOW CHART 1

Integrated Care System
Nottingham & Nottinghamshire

HIGH RISK PATIENT

- Paediatric Cystic Fibrosis
- Adult Cystic Fibrosis
- Patients <18 years under gastro / HPB team and on PERT

Adult Patients with:

- Total Pancreatectomy (due to risk of hypos)
- Pancreatic cancer patient awaiting surgery
- Pancreatic cancer patient who have had Whipples / Pancreatic duodenectomy (PPPD)
- Pancreatic cancer undergoing chemotherapy
- Malnutrition (BMI 20 or below and non – intentional weight loss).
- Those with extreme GI symptoms on reduction of taking PERT affecting quality of life, appetite and unintentional weight loss (e.g. bloating, abdominal pain on eating, loose / frequent / uncontrollable stools, weight loss, hypo's if diabetic)
- Patients taking somatostatin analogues for Neuroendocrine Tumour and Insulin Dependent Diabetes Mellitus (IDDM)
- Faecal elastase level <200(excluding those Post Oesophagogastric (OG) surgery)
- OG surgery with symptoms of malabsorption and assessed by an Upper GI dietitian. +/- Faecal elastase result due to secondary insufficiency risk.

Does your patient have Cystic Fibrosis?

NO

Patients under 18 years and receiving PERT for gastro/HPB - contact the specialist hospital team

Adult patient (>18 years) and have any of the following?

- Total Pancreatectomy
- Pancreatic cancer patient awaiting surgery
- Pancreatic cancer patient who have had Whipples / Pancreatic duodenectomy (PPPD)
- Pancreatic cancer undergoing chemotherapy
- Malnutrition (BMI 20 or below and non – intentional weight loss).
- Those with extreme GI symptoms on reduction of taking PERT affecting quality of life, appetite and unintentional weight loss (e.g. bloating, abdominal pain on eating, loose / frequent / uncontrollable stools, weight loss, hypo's if diabetic)
- Patients taking somatostatin analogues for Neuroendocrine Tumour
- Patients with Pancreatic Enzyme insufficiency (PEI) and Insulin Dependent Diabetes Mellitus (IDDM)
- Patients with Pancreatic Enzyme insufficiency (PEI) and are struggling to maintain their nutritional status
- Faecal elastase level <200 (excluding those post OG surgery)
- OG surgery with symptoms of malabsorption and assessed by an Upper GI dietitian. +/- Faecal elastase result due to secondary insufficiency risk.

YES

Continue to prescribe PERT THERAPY

If patients are struggling to obtain PERT convert Creon or Nutrizym 22 to Pancrex V Capsules – see **Conversion Table**

If patients have less than 1 week supply + unable to obtain PERT or Pancrex V capsules, swap to peptide based oral nutritional supplements until PERT therapy is able to be obtained. Follow **Flow Chart 4** **AND** refer to secondary care team if appropriate (nuhnt.urgentpertnuh@nhs.net)

NO

Reassess the risk status of the patient. Refer to **Start Point**

YES

Continue to prescribe PERT THERAPY

Paediatric Cystic Fibrosis Patients:

Priority to continue taking Creon Preparations. Creon Micro reserved for infants and young children who are unable to swallow capsules, 10,000 units and 25,000 unit capsules depending on availability and ability to swallow larger capsules.

Specialist CF dieticians will be able to provide tailored dose advice to individuals

If less than 1 week supply and unable to obtain any in the community, please ask parents to contact their Cystic Fibrosis team for urgent rescue therapy

NUH Paediatric CF Pharmacist: anneka.sareen1@nhs.net

NUH Paediatric respiratory secretaries: nuhnt.paediatricrespiratory@nhs.net

Adult Cystic Fibrosis Patients:

Priority to continue taking Creon Preparations.

10,000 unit and 25,000 unit capsules depending on availability and ability to swallow the larger capsules.

Specialist CF dieticians will be able to provide tailored dose advice to individuals.

If less than 1 week supply and unable to obtain any in the community, please ask patient to contact their Cystic Fibrosis team for urgent rescue therapy.

NUH Adult CF team: 07812 268 248 (Mon – Fri during office hours, excluding bank holidays).

FLOW CHART 2

LOW RISK PATIENT

Adult Patients with:

- Acute Pancreatitis. If 3 months since their last episode
- Distal pancreatectomy. If started on PERT before any symptoms occurred
- Acute necrotising pancreatitis where there is minimal nutritional risk (BMI >20 and no recent weight loss)
- Chronic pancreatitis where there is minimal nutritional risk (BMI >20

Is your patient categorised as Low Risk?

YES

Request for a faecal sample and test for faecal elastase* and wait for results before prescribing more PERT therapy

Has your patient run out of medication and faecal elastase results still pending?

NO → Wait for elastase results before proceeding further

YES

Are they symptomatic?
See page 7 for symptoms

NO → Wait for elastase results before proceeding further

YES

Prescribe peptide based oral nutritional supplementation (see **Flow Chart 4**) and follow **Flow Chart 3**. Wait for elastase results before proceeding further

NO

Please reassess the risk status of the patient. Refer to **Start Point**

Interpretation of results:

Elastase 300 – 500: STOP PERT (no longer indicated).

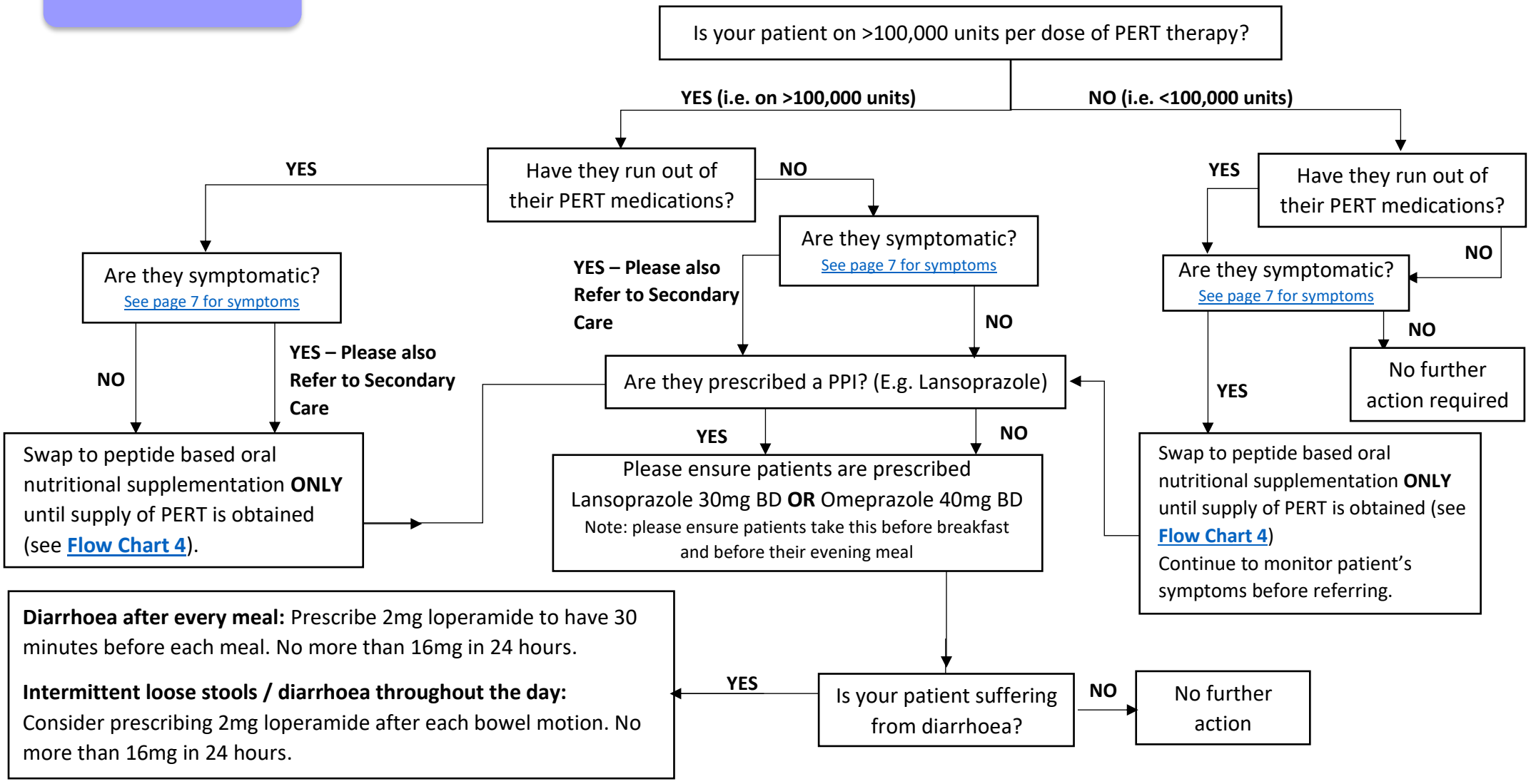
Elastase 200 – 300: Trial of reducing PERT (e.g. ½ the dosage every 2 weeks with aim to stop, unless symptoms return go back to previous stable PERT dose).

Elastase 100 – 200: If taking >100,000 units PERT with meals, follow **Flow Chart 3**, prescribe PERT and refer to secondary care team (nuhnt.urgentpertnuh@nhs.net).

Elastase <100: Follow **Flow Chart 1** – as these patients are deemed as High Risk, and refer to secondary care team (nuhnt.urgentpertnuh@nhs.net).

* **Faecal elastase test** is not affected by patients already taking pancreatic enzymes, therefore **no need to stop taking enzymes prior to test.**
Stool sample needs to be formed (liquid stool will give a false positive result).
Note: Results can take up to 3 weeks to come back.
Patients who are low risk, having a couple of weeks without pancreatic enzymes (if they have run out whilst awaiting test results) should not cause long-term harm.
Faecal elastase is often not applicable in OG patients due to secondary insufficiency

FLOW CHART 3



If patients are highly symptomatic **OR** continue to be symptomatic despite optimising on PPI and / or Loperamide and taking >100,000 units per dose of PERT, **refer patient** to rule out other potential GI causes e.g. bile acid malabsorption (BAM), small intestinal bacterial overgrowth (SIBO), Coeliac etc. Secondary care team (nuhnt.urgentpertnuh@nhs.net)

FLOW CHART 4

Integrated Care System
Nottingham & Nottinghamshire

Is your patient on nutritional supplementation drinks?

NO

Are they able to access any PERT?

NO

Are they losing weight (approx. 5% or any perceived weight loss), having hypos or having intractable or unmanageable abdominal symptoms?

NO

Peptide based nutritional supplementation not required at this time

YES

Swap to peptide based oral nutritional supplementation until PERT supplies become available

YES

Reduce patient's oral intake of food significantly and swap to peptide based oral nutritional supplements instead until PERT supplies become available

If further support needed GP can contact secondary care team for advice (nuhnt.urgentpertnuh@nhs.net) OR ask patient to contact their dietitian if they have one

YES

Peptide based nutritional supplementation not required at this time

YES

Are they on peptide based nutritional supplements (e.g. Vital 1.5kcal ® or Peptisip Energy HP ®)?

YES

If further support needed GP can contact secondary care team for advice (nuhnt.urgentpertnuh@nhs.net) **OR** ask patient to contact their dietitian if they have one

NO

Swap to a peptide based nutritional supplement until PERT supplies become available

Examples: These are 1:1 conversion (Vital 1.5kcal or Peptisip Energy HP can be used in replacement.)

- Fortisip Compact
- Ensure Plus
- Complan Shakes
- Fresubin Energy
- Fresubin 2kcal Fibre
- Fortijuice
- Ensure Plus Juice

Note – Vital 1.5kcal is found to be more palatable for patients and more likely to adhere than with Peptisip Energy HP.

During the shortage of PERT, patients may note volume changes. With the majority of these swaps, whilst the volume may differ the total calories will remain consistent. There is no fibre added to Vital 1.5kcal or Peptisip Energy HP products.

Body Weight	**Peptide based supplements needed per day (Vital 1.5k® or Peptisip Energy HP®)**
Below 40kg (6st 4lb)	Contact secondary care team (nuhnt.urgentpertnuh@nhs.net)
40 – 50kg (6st 4lb – 7st 12lb)	4 x 200ml bottles = 1200 kcal
50 – 60kg (7st 12lb – 9st 6lb)	5 x 200ml bottles = 1500 kcal
60 – 70kg (9st 6lb – 11st)	6 x 200ml bottles = 1800 kcal
70 – 80kg (11st - 12st 8lb)	7 x 200ml bottles = 2100 kcal
80 – 90kg (12st 8lb – 14st 2lb)	8 x 200ml bottles = 2400 kcal
Over 90kg (14st 2lb)	Contact secondary care team (nuhnt.urgentpertnuh@nhs.net)

If your patient has been trailed on a peptide based supplement and continues to lose weight, ask patient to contact their dietician if they have one OR refer the patient to the secondary care team (nuhnt.urgentpertnuh@nhs.net)

SYMPTOMS OF PANCREATIC EXOCRINE INSUFFICIENCY

Reference: O'Keefe et al, 2001, Genova Diagnostics, 2008, Friess & Michalski, 2009

- Steatorrhoea
  - Loose watery yellow/orange stool
  - Floats / difficult to flush away
  - Oily / visible food particles
- Large volume stool
- Undigested food in the stool
- Post-prandial abdominal pain
- Nausea / colicky abdominal pain
- Gastro-oesophageal reflux symptoms
- Bloating / flatulence
- Weight loss despite good oral intake
- Vitamin deficiencies (especially A,D,E,K,)
- Hypoglycaemia in patients with diabetes

CONVERSION TABLE

Equivalent Capsule Conversion Table when switching patients from Creon or Nutrizym capsules to Pancrex Capsules

	Creon 25,000 units	Nutrizym 22 (only for patients unable to tolerate Creon)	Creon 10,000 units	Pancrex 340mg capsules	Pancrex 125mg capsules
Equivalent number of capsules required	1	1	3	3	8
	2	2	5	6	16
	3	3	8	9	24
	4	4	10	12	32
	5	5	13	15	40
	6	6	15	18	48
	7	8	18	21	-
	8	9	20	25	-
	9	10	22	28	-
	10	11	25	31	-

NOTE: Pancrex powders should ONLY be indicated for patients requiring Enteral Feeding
Creon Micro is reserved for our Paediatric CF Patients

PERT Amounts to Prescribe during the National Shortage of PERT Therapy (Note: Maximum 1 month ONLY)

Dose (Creon 25,000 units)	Monthly requirement
x2 capsules with meals x1 capsule with snack	400 capsules
x4 capsules with meals x2 capsule with snack	600 capsules
x6 capsules with meals x3 capsule with snack	900 capsules
x8 capsules with meals x4 capsule with snack	1200 capsules
x10 capsules with meals x5 capsules with snacks	1500 capsules

(Based on 3 meals and 3 – 4 snacks / drinks per day plus buffer stock)

INTERPRETATION OF RESULTS

Elastase 300 – 500: STOP PERT (no longer indicated)

Elastase 200 – 300: Trial of reducing PERT (e.g. ½ the dosage every 2 weeks with aim to stop, unless symptoms return go back to previous stable PERT dose)

Elastase 100 – 200: If taking >100,000 units PERT with meals, follow **Flow Chart 3**, prescribe PERT and refer to secondary care team (nuhnt.urgentpertnuh@nhs.net)

Elastase <100: Follow **Flow Chart 1** – as these patients are deemed as High Risk, and refer to secondary care team (nuhnt.urgentpertnuh@nhs.net)

Patient Counselling on PERT Storage and Administration

In light of the PERT shortage, it is crucial that GPs support in counselling patients on the proper storage and the appropriate administration times of their PERT medications to maintain effectiveness and maximise the benefits of PERT. Improper storage and administrations can lead to enzyme degradation, which may reduce the efficacy of the treatment.

Key Storage Instructions:

- **Avoid High Temperatures:** PERT medications should be stored in a cool, dry place. If the ambient temperature is high (e.g. during a heatwave, or above 25^{o}C), patients should be advised to store their medication in the fridge.
- **Refrigeration Tips:** When storing PERT enzymes in the fridge, ensure that the bottle is tightly closed to prevent moisture damage. Before opening a refrigerated bottle, Patients should allow the medication to adjust to room temperature. This prevents condensation, which can also lead to moisture damage and degradation of the enzyme.

Administration Hints and Tips for PERT Therapy:

To ensure that patients get the maximum benefit from their PERT therapy, GPs should provide the following administration tips to their patients:

- **Timings with Meals and Snacks:**
    - Advise patients to take their medication with every meal and snack that contains fat, typically with the first few mouthfuls or during the meal. This ensures that the enzymes are present in the digestive tract when food arrives
    - For larger meals, patients may need to divide their dose, taking part of their dose at the beginning and part of their dose during their meal

- **Swallow capsules properly:**
    - PERT capsules should be swallowed whole with plenty of water. They should not be crushed or chewed , as this can damage the enzyme coating and reduce effectiveness
    - Advise patients not to swallow their enzymes with hot drinks, as heat can degrade the enzymes, making them less effective.
    - Stress the importance of consistency in taking PERT with all fat containing meals and snacks. Skipping doses can lead to malabsorption and associated symptoms, impacting their overall health.
    - Ensure patients stay well hydrated, as proper hydration supports digestive function and helps the enzymes work more effectively.

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