CONDITION

Exocrine pancreatic insufficiency

Exocrine pancreatic insufficiency occurs when the pancreas does not provide enough enzymes to digest food properly.

WHAT IT IS
Too few pancreatic enzymes for normal digestion

BODY SYSTEM
Digestive system

MAIN SYMPTOMS
Greasy stools, bloating, diarrhoea, unintended weight loss

WHAT CAUSES IT
Pancreatic damage, blocked ducts, surgery, or inherited conditions

HOW IT IS DIAGNOSED
Fecal elastase, sometimes stool-fat or breath testing

MAIN TREATMENT
Pancreatic enzyme replacement with meals and snacks

CAN IT BE CURED?
Sometimes - pancreatic function can recover

IS IT AN EMERGENCY?
No - sudden severe abdominal pain needs emergency assessment

LONG-TERM OUTLOOK
Often manageable, but linked to the underlying condition

Overview

Exocrine pancreatic insufficiency, often shortened to EPI, means your pancreas does not provide enough digestive enzymes, or the enzymes cannot reach and mix with food properly.

The pancreas is an organ behind the stomach. Its "exocrine" function releases enzymes into the small intestine. These enzymes break down fat, protein, and carbohydrates so nutrients can be absorbed.

When enzyme levels are too low, food may pass through without being fully digested. This maldigestion can lead to greasy stools, diarrhoea, weight loss, and vitamin deficiencies.

EPI is not the same as diabetes, which involves the pancreas's "endocrine" function and hormones such as insulin. However, some pancreatic conditions can affect both functions.

Untreated malabsorption can affect nutrition, muscle strength, and bone health. Pancreatic enzymes often improve digestion, although the underlying cause may need separate care.

Symptoms

Symptoms can be mild or absent at first. They often become clearer as the ability to digest fat decreases.

Common symptoms include:

Greasy stool caused by undigested fat is called steatorrhoea. Not everyone with EPI notices obvious oil, and stool changes may vary with the amount of fat eaten.

EPI can reduce absorption of vitamins A, D, E, and K. Over time, deficiencies may contribute to weak bones, easy bruising, vision problems in low light, or nerve and muscle symptoms. Symptoms alone cannot confirm EPI.

Children may have poor weight gain or slower growth. In babies with cystic fibrosis, difficulty gaining weight and frequent bulky stools may be early signs.

- Loose, frequent, pale, or greasy stools
- Stools that float, are difficult to flush, or smell unusually strong
- Bloating, excess gas, or abdominal discomfort after eating
- Unintended weight loss or difficulty maintaining weight
- Tiredness, weakness, or loss of muscle
- Signs of vitamin or mineral deficiencies

Causes and risk factors

EPI develops when the pancreas cannot make enough enzymes, pancreatic tissue has been removed, or enzymes cannot reach and mix with food.

Chronic pancreatitis is a major cause. This long-term inflammation gradually scars the pancreas. Severe acute pancreatitis can also damage pancreatic tissue, although function sometimes improves during recovery.

Other causes and associated conditions include:

Not everyone with these conditions develops EPI. Risk depends partly on how much pancreatic function remains and whether enzymes can reach food at the right time.

Smoking and heavy alcohol use can increase the risk of chronic pancreatitis, which may lead to EPI. Some people develop chronic pancreatitis without either risk factor.

- Cystic fibrosis, an inherited condition that produces thick secretions
- Pancreatic cancer or another growth blocking a pancreatic duct
- Surgery removing part or all of the pancreas
- Surgery involving the stomach or upper small intestine
- Severe or long-standing coeliac disease
- Crohn's disease affecting the small intestine
- Type 1 or type 2 diabetes
- Rare inherited pancreatic conditions

Diagnosis

Digestive symptoms have many possible causes, so EPI should not be diagnosed from stool appearance alone.

Your clinician will usually ask about symptoms, weight changes, medical history, operations, medicines, and family history. Testing may include a fecal elastase test, which measures a pancreatic enzyme in a stool sample.

A solid or semi-solid sample is preferred. Watery diarrhoea can dilute elastase and produce a falsely low result. A result below 100 micrograms per gram provides strong evidence of EPI, while a result between 100 and 200 is less certain and may need further assessment. Pancreatic enzyme treatment does not usually need to be stopped before this test.

Other possible tests include:

Imaging may identify a cause, such as chronic pancreatitis or a mass, but does not directly measure enzyme function. A normal-looking pancreas does not always rule out EPI.

Improvement after trying enzymes is not enough by itself to confirm the diagnosis. Symptoms may improve for other reasons, and an incorrect diagnosis could delay investigation of the actual cause.

- Blood tests for anaemia, vitamin deficiencies, liver health, and nutrition
- A stool-fat test to measure unabsorbed fat
- Breath tests that assess fat digestion, where available

- CT, MRI, or ultrasound imaging to look for pancreatic damage or blockage

Treatment and management

The main treatment is pancreatic enzyme replacement therapy, or PERT. These capsules contain versions of enzymes that digest fat, protein, and carbohydrates.

PERT is taken with meals and snacks so the enzymes mix with food. Timing and amount matter, and needs may vary with meal size, fat content, symptoms, and remaining pancreatic function. Your care team can adjust treatment.

Follow the instructions for the specific product. Capsules should not be crushed or chewed because this can damage their protective coating and irritate the mouth.

If symptoms continue, possible reasons include incorrect timing, an insufficient amount, missed doses, or another digestive condition. Sometimes an acid-reducing medicine like omeprazole or lansoprazole is considered because stomach acid can reduce how well enzymes work. This requires individual assessment.

Most people do not need to remove all fat from their diet. Severe fat restriction can make it harder to get enough energy and may worsen weight loss. A dietitian familiar with pancreatic conditions can help while treatment is adjusted.

Management may also include:

Vitamin supplements are not a substitute for enzyme treatment. High-dose fat-soluble vitamins can cause harm, so replacement should be based on your needs and monitored.

- Treating the condition responsible for EPI
- Replacing vitamins or minerals when tests show a deficiency
- Monitoring weight, muscle strength, and bowel symptoms
- Checking bone health when there is a risk of osteoporosis
- Support to stop smoking or reduce harmful alcohol use

Complications

Without effective treatment, EPI can cause malnutrition even when you are eating enough food.

Possible complications include:

EPI may occur alongside complications of its underlying cause. Chronic pancreatitis, for

example, can cause persistent pain or diabetes. Pancreatic or bile duct blockage can cause jaundice, which is yellowing of the skin or whites of the eyes.

Regular follow-up should consider weight, nutrition, vitamin levels, and bone health even if bowel movements improve.

- Unintended weight and muscle loss
- Low levels of fat-soluble vitamins
- Osteopenia or osteoporosis, meaning weakened bones
- Reduced strength and physical function
- Poor growth in children
- Lower quality of life because of bowel urgency or discomfort

Prevention

EPI cannot always be prevented. Inherited conditions, necessary pancreatic surgery, severe acute pancreatitis, and some causes of pancreatic blockage are not under your control.

Reducing chronic pancreatic injury may lower risk in some people. This includes not smoking and avoiding heavy alcohol use. If alcohol has contributed to pancreatitis, your healthcare team may advise avoiding it completely.

Prompt care for pancreatic or digestive conditions may identify declining function before severe malnutrition develops. No supplement, cleanse, or special diet has been proven to protect pancreatic enzyme production.

Living with it and what to expect

The course of EPI is closely tied to its cause. When pancreatic tissue is permanently damaged or removed, enzyme replacement is often long term. After acute pancreatitis or treatment of a reversible cause, function may partly recover and repeat assessment may be appropriate.

Stool symptoms may improve soon after effective enzyme treatment begins, but regaining weight, muscle, or vitamin stores can take longer. Some people need several adjustments before digestion becomes more predictable.

Enzymes work only for the food eaten with them. Keep the medicine available when eating away from home or travelling, and follow its storage instructions.

Routine follow-up may cover bowel changes, missed doses, weight, diet, and new symptoms.

Blood tests or bone assessment may be used after prolonged malabsorption.

Most people can continue ordinary work, school, exercise, and social activities. Managing capsules around food can take time to become familiar, and toilet access may remain important while treatment is adjusted. The underlying condition often has more influence on long-term health than EPI itself.

When to get medical help

Arrange a routine medical appointment if you have ongoing greasy or pale stools, repeated diarrhoea, unexplained weight loss, or persistent bloating. These symptoms need assessment but do not usually indicate an emergency.

If you already use pancreatic enzymes, request follow-up if symptoms continue, your weight is falling, or you are avoiding food because of discomfort. Do not keep increasing or stopping treatment without discussing why it may not be working.

Seek urgent medical assessment for:

Seek emergency care for sudden severe upper abdominal pain, especially if it spreads to the back or occurs with repeated vomiting, fainting, confusion, breathing difficulty, or a very unwell feeling. These symptoms are not typical of uncomplicated EPI and may indicate acute pancreatitis or another serious problem.

- New yellowing of the skin or eyes
- Dark urine with pale stools
- Persistent vomiting or inability to keep fluids down
- Rapid or substantial unintended weight loss
- New or worsening abdominal pain

Common questions

What does EPI stool look like?

It may be pale, bulky, loose, oily, difficult to flush, floating, or unusually strong-smelling. Stool appearance cannot confirm EPI because infections, coeliac disease, food intolerances, and other conditions can cause similar changes.

Is EPI the same as pancreatitis?

No. Pancreatitis is inflammation of the pancreas, while EPI is reduced digestive enzyme

activity. Chronic or severe acute pancreatitis can cause EPI, but surgery, cystic fibrosis, blockage, and other conditions can also cause it.

Can I eat fat if I have EPI?

Many people can eat a normal, balanced amount of fat when enzyme treatment is effective. Cutting out most fat may lead to low energy intake and further weight loss. Dietary changes should reflect your symptoms, nutritional needs, and underlying condition.

Will I need pancreatic enzymes forever?

Some people do, particularly after major pancreatic surgery or permanent damage from chronic pancreatitis or cystic fibrosis. Others may recover some function after a temporary injury. Follow-up testing and your clinical course help determine whether treatment remains necessary.

Can EPI cause diabetes?

EPI does not automatically cause diabetes. However, the same pancreatic damage can reduce both digestive enzymes and insulin production. People with chronic pancreatitis or pancreatic surgery may therefore develop both conditions.

Does EPI mean I have pancreatic cancer?

No. EPI has several possible causes. Pancreatic cancer can sometimes cause it by damaging the pancreas or blocking enzyme flow, so newly diagnosed EPI may require investigation to identify the cause.

Sources

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