



SCAN/CLICK for PODCAST

Exocrine Pancreatic Insufficiency (EPI)

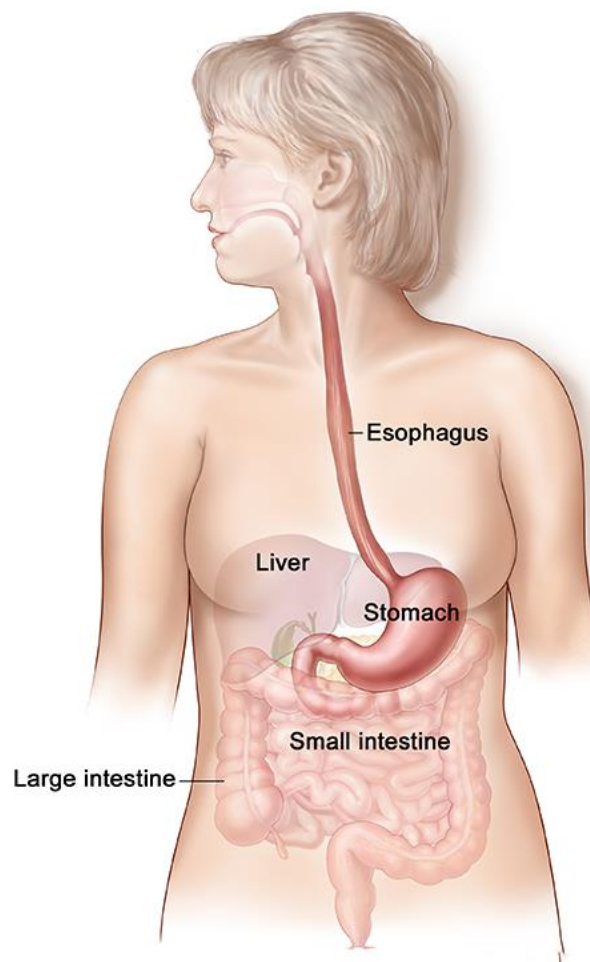
You may have seen ads on TV or online regarding a condition called EPI or Exocrine Pancreatic Insufficiency. Or you may have recently been diagnosed with EPI. This article was written to help explain more about this digestive condition. First, you should know that EPI is a pancreatic digestive malfunction. Most people don't even realize that the pancreas plays a vital role in digestion. It is a key player.

Your Gut Feeds You...

So, before discussing EPI, we must review the normal digestive process. You may not realize it, but your digestive system is a marvelous piece of engineering - always ready, waiting to automatically process the next batch of food that comes down the pipe. Working 24/7, this process requires no conscious action by you.

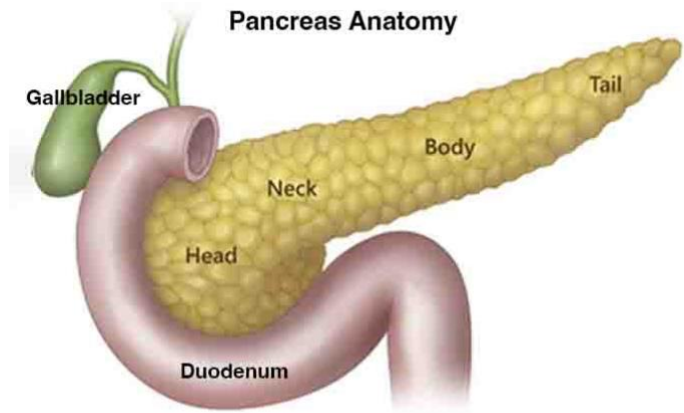
You may think that you feed your gut, but in reality, your gut feeds you. Without effective processing, most of your food would be as deadly as poison if it entered your bloodstream directly. Your gut can best be described as an elaborate food "disassembly" plant. Everything you eat is broken down into smaller molecules that your body can efficiently and safely absorb and use for energy, growth, and repair. The process of breaking down large molecules into their smallest parts is termed digestion.

After chewing and swallowing, food is processed by the churning motion of the stomach, which mixes the food particles with powerful hydrochloric acid. This strong stomach acid liquefies the food into a substance called chyme, which has the consistency of cream of potato soup. Eventually, the chyme is slowly injected into the small intestine, where it is mixed with bile (from the liver and gallbladder) and pancreatic enzymes.



What is the Pancreas?

The pancreas is a vital organ behind your stomach and in front of your spine. The pancreas is about 6 inches long - about the length of your hand. The right side of your body contains the head of your pancreas. The left side of your body houses the tail of your pancreas.



The Pancreas has TWO Jobs.




It is critical to realize that the pancreas serves two different functions, each vital to the body's overall health and metabolism.

1. The first function, the ENDOCRINE function, is insulin production to regulate blood sugar. Abnormalities in the endocrine function can cause diabetes.
2. The second function, called the EXOCRINE function, is the production of chemicals called pancreatic enzymes that help break down carbohydrates, fat, and protein into smaller parts. This allows the body to absorb the nutrients it needs to function. EPI is a disorder of the exocrine function, thus the name Exocrine Pancreatic Dysfunction.

Normal Pancreatic Exocrine Function

Three main pancreatic enzymes are involved in this EXOCRINE function:

- LIPASE, which breaks down dietary fat into fatty acids
- PROTEASE, which breaks down dietary protein into amino acids
- AMYLASE, which breaks down dietary carbohydrates into simple glucose.

<p>Lipase (breaks down fats)</p>  <p>into Fatty Acids</p>	<p>Protease (breaks down proteins)</p>  <p>into Amino Acids</p>	<p>Amylase (breaks down carbohydrates)</p>  <p>into Simple Sugars</p>
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For example, the crisp fat in your breakfast bacon is converted into smaller fatty acids, while the protein in your dinner lamb chop turns into smaller amino acids, and the large carbohydrates in your mashed potatoes are transformed into an essential energy source: simple sugar or glucose. Once processed, these much simpler nutrients are absorbed into your bloodstream.

Exocrine Pancreatic Insufficiency (EPI)

EPI occurs when the pancreas does not produce enough pancreatic enzymes to break down food, leading to various symptoms and nutritional deficiencies. This is called malabsorption.

Symptoms of EPI Include

- **Steatorrhea:** People with EPI cannot absorb all the fat they eat, so undigested fat is excreted, resulting in frequent pale, oily, or greasy, foul-smelling stools that float and don't easily flush away in the toilet. While steatorrhea is a sign of severe EPI, not everyone has this symptom.
- Bloating and abdominal discomfort
- Flatulence and diarrhea
- Unintended weight loss
- **Malnutrition:** Signs of malnutrition may include fatigue, easy bruising, delayed wound healing, and muscle weakness.
- Low bone mass or osteopenia
- Vitamin deficiencies, particularly in the fat-soluble vitamins A, D, E, and K

What Causes EPI?

The cause of EPI is not well understood. However, the two leading causes of EPI are chronic pancreatitis (most often due to heavy alcohol use) in adults and cystic fibrosis in children. EPI occasionally occurs in people living with other health problems, such as Crohn's disease, untreated celiac disease, diabetes, and post-bariatric surgery.

How Does Your Doctor Know?

Primary care doctors may be able to diagnose EPI. However, in most cases, they refer patients to a gastroenterologist for further testing. One reason EPI is sometimes hard to diagnose is that symptoms such as diarrhea, bloating, excessive gas, and abdominal pain can be similar to those of other gastrointestinal (GI) conditions. Aside from severe steatorrhea, these symptoms are pretty similar to other common gastrointestinal disorders, such as Irritable Bowel Syndrome (IBS) and Inflammatory Bowel Disease (IBD).

To sort this out, your doctor will begin the evaluation with questions about your symptoms and perform a physical examination. Further diagnostic studies, including blood tests, "scope" tests, and imaging studies such as abdominal ultrasound or CT scan, may be required depending on the symptoms.

Fecal Elastase

However, when diagnosing EPI, the most important diagnostic test is the Fecal Elastase test. Elastase is another enzyme produced by the pancreas. Measuring its levels in stool indicates how well the pancreas is functioning in terms of enzyme production. Apart from the “ick” factor in collecting a stool specimen, this non-invasive method has high sensitivity and specificity for diagnosing EPI. Low levels of fecal elastase indicate EPI, as they suggest a deficiency in pancreatic enzyme production. Fecal Elastase testing is a good way to differentiate EPI from other disorders. Fecal Elastase testing offers high accuracy in detecting EPI and in differentiating EPI from other gastrointestinal diseases.

Like all diagnostic tests, the accuracy of the Fecal Elastase test is not 100%. However, a very low Fecal elastase level is strong evidence for this diagnosis. A normal level is over 200 ug of elastase/g.

General Comments & Additional Information				
Clinical Info: Steatorrhea, weight loss				
Ordered Items				
Pancreatic Elastase, Fecal				
TESTS	RESULT	FLAG	UNITS	REFERENCE
Pancreatic Elastase, Fecal	89		mcg elastase/g	
	Severe pancreatic Insufficiency			<99
	Moderate pancreatic insufficiency			<100 - 199
	Normal			>200

How about Treatment?

Once the diagnosis of EPI has been established, there are six main goals.

1. Reduce digestive symptoms
2. STOP malabsorption with Pancreatic Enzyme Replacement Therapy (PERT)
3. Assess and correct any nutritional deficiencies
4. Dietary education and consider Registered Dietician Consultation.
5. Monitor bloodwork and bone health
6. Establish a program of long-term follow-up

PERT: the primary treatment for EPI

If you are diagnosed with EPI, your doctor will probably start you on pancreatic enzyme replacement therapy or PERT. PERT is the standard of care for EPI treatment. It replaces the digestive enzymes that your pancreas does not produce. These medications contain pancrelipase, a blend of digestive enzymes extracted from the pancreas of pigs, the same pigs people eat as pork. PERT medications come in the form of capsules. People must take PERT medications orally at each meal and snack. Typically, enzymes are taken just before eating to ensure they mix with the food and aid digestion. (People who do not ingest pork

products due to religious reasons may be granted an exemption from religious leaders to use these medications.)

There are several FDA-approved PERT medications, each with specific characteristics and formulations. Factors such as insurance coverage or cost may influence a person's formulation.



Is A Special Diet Necessary?

Many patients have this question. The answer is yes and no. People living with EPI must carefully select their foods to ensure they eat enough calories and get sufficient nutrients to prevent nutritional deficiencies. Fat intake is a critical consideration for people with EPI. These individuals have difficulty absorbing fat and experience deficiencies in fat-soluble vitamins A, D, E, and K.

We recommend eating a varied, balanced diet of carbohydrates, fats, and protein. A person should choose unprocessed, fresh foods whenever possible. When choosing foods high in fat, a person should look for nutritious choices instead of products containing lots of saturated or trans fats. Foods rich in healthy fats include nuts, coconut, olive oil, avocado, seeds, and fatty fish like salmon.

A person with EPI should avoid too much dietary fiber. For most people, adding more fiber to the diet aids digestion and promotes satiety. However, people living with EPI must limit their fiber intake, as fiber can disrupt the digestive enzymes.

Avoid heavy, fatty meals by eating smaller meals more frequently over the day. Avoid alcohol, as alcohol can damage the pancreas and disrupt the production of pancreatic enzymes, which can worsen EPI symptoms.

TIPS for Living with EP!

1. Keep track of what foods work best to manage symptoms. Each individual needs to find what works best to maintain a good balance. Work with a Registered Dietician.
2. Stick with a low-fat diet. Your body has an especially tough time digesting fat, so you must avoid getting too much.
3. It's essential to avoid saturated and trans fats.
4. Drink minimal amounts of fluid with meals and then hydrate about 20–30 minutes after the meal. This will help you retain the food in your digestive system longer, thus increasing the chance of absorption.
5. Eat frequent, smaller meals throughout the day.
6. Make sure to take the correct dosage of PERT capsules at the beginning of each meal.
7. Know where the nearest bathrooms are. When away from home, knowing where restrooms might be is good. There are a few apps out there to help. You put in your location, and it will give you the locations of the nearest bathrooms. iPhone apps like BATHROOM SCOUT and FLUSH TOILET FINDER are available in the App Store.
8. Be prepared. Keep an emergency kit in your car with changes of clothes, wipes, and a small supply of PERT capsules, Imodium antidiarrheal, etc.
9. Don't forget to pack your PERT pills when traveling.
10. Build a **support system**. Keeping positive people around helps you get through the more challenging days.
11. Keep your scheduled physician office visits, periodic blood work, etc.

Conclusion

There is no cure for EPI, but it is a manageable condition with the proper knowledge, treatment, and lifestyle adjustments. Understanding the role of the pancreas, recognizing symptoms, and adhering to your treatment program maximize your chance for a normal life.

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