



BRIEF ANSWERS  
TO SPECIFIC  
CLINICAL  
QUESTIONS

## Q: When should serum amylase and lipase levels be repeated in a patient with acute pancreatitis?

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**A:** In general, repeating serum amylase and lipase levels has no value once the diagnosis of acute pancreatitis has been made. In gallstone-related acute pancreatitis (ie, in most cases), delaying surgery for several days for the pancreas to “cool down” is common practice, but repeating serum pancreatic enzyme levels daily during this period is of no prognostic value, as the levels do not correlate with the severity, course, or outcome of the acute pancreatitis.<sup>1-3</sup> Rather, the decision to proceed with treatment should be based on clinical measures, such as improvement of pain or increasing appetite.

Repeated pancreatic enzyme tests have diagnostic value, though. For example, in mild acute pancreatitis, symptoms tend to resolve in less than 1 week, whereas in severe cases, not only do symptoms persist beyond 1 week, but complications (new symptoms) also develop after the first week. In such cases, serum amylase and lipase levels may be repeated when the patient has signs and symptoms of persisting pancreatic or peripancreatic inflammation, blockage of the pancreatic duct, or development of a pseudocyst,<sup>3</sup> but the purpose of retesting the levels is to diagnose complications, not to monitor the status of the pancreas. However, imaging tests generally have a higher sensitivity than serum amylase and lipase levels for diagnosing complications of acute pancreatitis.

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### ■ MAKING BEST USE OF SERUM PANCREATIC ENZYME LEVELS

The diagnosis of pancreatitis requires two of the following three features: abdominal pain characteristic of acute pancreatitis, a serum amylase or lipase level at least three times the upper limit of normal, and characteristic findings of acute pancreatitis on computed tomography (CT).<sup>3</sup> In most patients, initial CT is not clinically warranted. It is warranted for patients who are transferred from other institutions after a few days of care, when the diagnosis of acute pancreatitis is in doubt, or when traumatic pancreatitis is suspected. Contrast-enhanced CT may be required at intervals during the hospitalization to detect and monitor the course of intra-abdominal complications of acute pancreatitis, such as the development of necrosis, fluid collections, and vascular complications.

A serum amylase or lipase level greater than three times the upper limit of normal is characteristic of acute pancreatitis and almost excludes other conditions associated with elevated nonpancreatic enzyme levels.<sup>4</sup> Conditions associated with abdominal pain and elevation of serum amylase and lipase include perforated ulcer, mesenteric ischemia, and ruptured ectopic pregnancy (TABLE 1, TABLE 2).<sup>3</sup>

Amylase is also noted in salivary glands, fallopian tubes and cyst fluid, testes, lungs, thyroid, tonsils, breast milk, sweat, tears, and some malignant neoplasms. Serum lipase is often considered a more specific marker of acute pancreatitis than serum amylase, but recent data cast doubt on this.<sup>5</sup> ■

Elevated amylase and lipase levels are useful diagnostically, not prognostically

TABLE 1

**Conditions associated with serum lipase elevation**

WITH ABDOMINAL PAIN

**Pancreatic conditions**

Acute pancreatitis  
 Chronic pancreatitis (acute exacerbation)  
 Interventions such as endoscopic retrograde cholangiopancreatography  
 Surgery  
 Trauma

**Other conditions**

Acute cholecystitis  
 Appendicitis  
 Diabetic ketoacidosis  
 Inflammatory bowel disease  
 Intestinal obstruction  
 Mesenteric infarction

WITHOUT ABDOMINAL PAIN

**Malignancy**

Duodenum  
 Esophagus  
 Gastroesophageal junction  
 Liver  
 Small bowel  
 Stomach  
 Tongue

**Other causes**

Benign hyperlipasemia  
 Esophagitis  
 Familial hyperlipasemia  
 Liver failure  
 Renal failure

TABLE 2

**Conditions associated with serum amylase elevation**

WITH ABDOMINAL PAIN

**Pancreatic conditions**

Acute pancreatitis  
 Chronic pancreatitis (acute exacerbation)  
 Interventions such as endoscopic retrograde cholangiopancreatography  
 Surgery  
 Trauma

**Other conditions**

Appendicitis  
 Diabetic ketoacidosis  
 Fallopian and ovarian cyst  
 Intestinal obstruction  
 Mesenteric infarction  
 Peritonitis  
 Ruptured ectopic pregnancy  
 Salpingitis

WITHOUT ABDOMINAL PAIN

**Parotid gland conditions**

Inflammation, trauma, surgery  
 Radiation injury of head and neck

**Malignancy**

Breast  
 Colon  
 Lung  
 Multiple myeloma  
 Ovary  
 Pancreas  
 Pheochromocytoma  
 Thymoma

**Other conditions**

Benign hyperamylasemia  
 Chronic alcoholism  
 Liver failure  
 Macroamylasemia  
 Renal failure

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