Ultrasound
Abdominal ultrasoundography can be used to detect gallstones, although bowel gas may limit its accuracy in the acute setting.

CT
Contrast enhanced computed tomography (CT) is useful for differentiating SAP from other conditions presenting with abdominal pain and elevated pancreatic enzymes. It also helps to delineate local complications associated with SAP:
- Pancreatic or peripancreatic necrosis is diagnosed when some or all of the pancreas or surrounding area fails to enhance with contrast.
- To determine whether a necrotic area is infected, it can be sampled by fine-needle aspiration under CT guidance and analyzed with Gram stain and culture for evidence of gut-derived bacteria and/or fungal organisms.

Classifications & Definitions
- Ranson's criteria
  - At least 2 of the following 4 criteria:
    - Pancreatic or peripancreatic necrosis
    - Respiratory failure (PaO2/FiO2 <300 mm Hg)
    - Hemorrhage (renal failure: serum creatinine level >176.8 mmol/L or a urine output less than 0.5 mL/kg/h for 24 hours).
  - At least 8 of the APACHE II criteria

Gastrointestinal Tract Bleeding
- Acute upper gastrointestinal tract bleeding (>500 mL in 24 hours);
- Local complications such as: - necrosis, - pseudocyst, - abscess;
- At least 3 of Ranson's criteria
- At least 8 of the APACHE II criteria

Pancreatitis [created by Paul Young, 04/10/07]

Aetiology
- Alcoholic pancreatitis is more common among men and alcoholic pancreatitis is more common among women.
- Alcoholic pancreatitis occurs in men more often than in women.
- The widely used Atlanta classification categorizes acute pancreatitis as mild or severe.
- Pancreatitis is classified as severe if any of the following 4 criteria are met:
  - Organ failure (2 or more of the following): - shock, systemic blood pressure <90 mm Hg,
  - Pulmonary insufficiency (PaO2 <60 mm Hg),
  - Renal failure (serum creatinine level >176.8 mmol/L or after hydration, and gastrointestinal tract bleeding >500 mL in 24 hours).
  - Local complications such as:
    - necrosis,
    - pseudocyst,
    - abscess;
- At least 3 of Ranson's criteria
- At least 8 of the APACHE II criteria

Imaging
- Pancreatic necrosis:
  - Pancreatic necrosis is the presence of a diffuse or focal area of nonviable pancreatic parenchyma, often associated with peripancreatic necrosis.
  - Severe acute pancreatitis with pancreatic or peripancreatic necrosis is also referred to as necrotizing pancreatitis.

- Infected pancreatitis:
  - Initially a sterile necrosis (mortality, 10%), necrotizing pancreatitis becomes infected with bacteria of gut origin in 40% to 70% of cases and is then called infected necrosis (mortality, 25%).

- Pancreatic pseudocyst:
  - Pancreatic pseudocyst is a collection of pancreatic juice enclosed by a wall of fibrous or granulation tissue that develops as a result of a persistent leak of pancreatic juice from the pancreatic duct.

- Pancreatic abscess:
  - Pancreatic abscess is a circumscribed intra-abdominal collection of pus that sometimes contains gas.
  - It follows infection of a limited area of pancreatic or peripancreatic necrosis and usually takes 4 to 6 weeks to evolve.

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Ranson's criteria
- Acute pancreatitis
  - Patients who had a severe acute pancreatitis were administered parenteral nutrition in an effort to avoid stimulation of the pancreas. More recently, it has been shown in animal models that enteral nutrition prevents intestinal atrophy and improves the barrier function of the gut mucosa.
- There have demonstrated that enteral feeding is not only safe and feasible but is also associated with fewer infectious complications, and is less expensive than TPN.
- Enteral feeding should be commenced whenever possible.

Prevention of Pancreatic Infection
- Pancreatic or peripancreatic infection develops in 40% to 70% of patients with pancreatic necrosis and is the leading cause of morbidity and mortality.
- Infection usually occurs at least 10 days after the onset of SAP.
- Methods to reduce the incidence of infection in patients with SAP include:
  - Selective gut decontamination - unproven
  - Prophylactic systemic antibiotics - use of broad spectrum antibiotics is supported by metaanalysis data but may lead to fungal superinfection
  - If fever or leukocytosis persists or develops beyond 7 to 10 days without an obvious source of infection, fine-needle aspiration of the necrotic area should be performed to rule out infection.

ERCP
- A metaanalysis of 4 RCTs of endoscopic sphincterotomy in patients with severe biliary pancreatitis showed that sphincterotomy reduced complications and mortality of SAP in patients with biliary obstruction or cholangitis.
- The role of early ERCP in patients without biliary obstruction or cholangitis is unclear.
- One study reported higher mortality after ERCP in such patients.
- An accepted practice is to perform endoscopic sphincterotomy in patients with evidence of biliary obstruction (cholelithiasis, jaundice) or elevated liver test results except in those with rapidly normalizing test results.

Surgery
- Debridement by surgery or a less invasive technique is indicated in patients with infected necrosis.
- Outcomes are better if surgery is delayed until the necrosis has organized, usually about 4 weeks after disease onset.
- The preferred surgical procedure for SAP is necrosectomy (debridement) with the placement of wide-bore drains for continuous postoperative irrigation.
- For patients who are poor surgical candidates or who have well-contained infection, minimal-access necrosectomy by either percutaneous or endoscopic routes has shown encouraging results.
- For patients with biliary pancreatitis, cholecystectomy should be performed during the initial hospitalization or after the resolution of intra-abdominal inflammation to prevent recurrence. In patients too ill to undergo cholecystectomy, endoscopic sphincterotomy is an alternative.

Prognosis
- Mild acute pancreatitis has a mortality rate of less than 1%.
- The death rate for severe acute pancreatitis is 10% with sterile and 25% with infected pancreatic necrosis.
- Approximately half the deaths of patients with SAP occur within 2 weeks of onset. Early mortality and mortality in patients with SAP are attributable to organ failure secondary to systemic inflammatory response syndrome.
- The remaining deaths occur because of later complications of infected necrosis.

Epidemiology
- Severe acute pancreatitis occurs in men more often than in women.
- Alcoholics are more common among men; alcoholic pancreatitis is more common among women.
- Patients with SAP typically complain of fairly sudden onset of severe upper abdominal pain, radiating to the back, often associated with nausea and vomiting.
- Marked elevations in serum amylase and lipase (>3 times the upper limit of normal) support the diagnosis of pancreatitis in a patient with severe abdominal pain.
- However, most elevations of pancreatic enzymes may be observed in other intra-abdominal emergencies.
- In the presence of pancreatitis, an increase in liver enzyme values, especially of aspartate aminotransferase to more than 3 times normal, suggests a biliary cause.