



FIGURE 371-1 Acute pancreatitis: computed tomography (CT) evolution. **A.** Contrast-enhanced CT scan of the abdomen performed on admission for a patient with clinical and biochemical parameters suggestive of acute pancreatitis. Note the abnormal enhancement of the pancreatic parenchyma (*arrow*) suggestive of interstitial pancreatitis. **B.** Contrast-enhanced CT scan of the abdomen performed on the same patient 6 days later for persistent fever and systemic inflammatory response syndrome. The pancreas now demonstrates significant areas of nonenhancement consistent with development of necrosis, particularly in the body and neck region (*arrow*). Note that an early CT scan obtained within the first 48 h of hospitalization may underestimate or miss necrosis. **C.** Contrast-enhanced CT scan of the abdomen performed on the same patient 2 months after the initial episode of acute pancreatitis. CT now demonstrates evidence of a fluid collection consistent with walled-off pancreatic necrosis (*arrow*). (Courtesy of Dr. KJ Mortelet, Brigham and Women's Hospital; with permission.)

describes the hospital course of the disease. In the *early phase* of acute pancreatitis, which lasts 1–2 weeks, severity is defined by clinical parameters rather than morphologic findings. Most patients exhibit SIRS, and if this persists, patients are predisposed to organ failure. Three organ systems should be assessed to define organ failure: respiratory, cardiovascular, and renal. Organ failure is defined as a score of 2 or more for one of these three organ systems using the modified Marshall scoring system. Persistent organ failure (>48 h) is the most important clinical finding in regard to severity of the acute pancreatitis

episode. Organ failure that affects more than one organ is considered multisystem organ failure. CT imaging is usually not needed or recommended during the first 48 h of admission in acute pancreatitis.

The *late phase* is characterized by a protracted course of illness and may require imaging to evaluate for local complications. The important clinical parameter of severity, as in the early phase, is persistent organ failure. These patients may require supportive measures such as renal dialysis, ventilator support, or need for supplemental nutrition via the nasojejunal or parenteral route. The radiographic feature of greatest importance to recognize in this phase is the development of necrotizing pancreatitis on CT imaging. Necrosis generally prolongs hospitalization and, if infected, may require operative, endoscopic, or percutaneous intervention.

TABLE 371-3 SEVERE ACUTE PANCREATITIS

Risk Factors for Severity

- Age >60 years
- Obesity, BMI >30
- Comorbid disease (Charlson Comorbidity Index)

Markers of Severity at Admission or Within 24 h

- SIRS—defined by presence of 2 or more criteria:
 - Core temperature <36° or >38°C
 - Heart rate >90 beats/min
 - Respirations >20/min or Pco₂ <32 mmHg
 - White blood cell count >12,000/μL, <4000/μL, or 10% bands
- APACHE II
- Hemoconcentration (hematocrit >44%)
- Admission BUN (>22 mg/dL)
- BISAP Score
 - (B) BUN >25 mg/dL
 - (I) Impaired mental status
 - (S) SIRS: ≥2 of 4 present
 - (A) Age >60 years
 - (P) Pleural effusion
- Organ failure (Modified Marshall Score)
 - Cardiovascular: systolic BP <90 mmHg, heart rate >130 beats/min
 - Pulmonary: Pao₂ <60 mmHg
 - Renal: serum creatinine >2.0 mg%

Markers of Severity During Hospitalization

- Persistent organ failure
- Pancreatic necrosis

Abbreviations: APACHE II, Acute Physiology and Chronic Health Evaluation II; BMI, body mass index; BISAP, Bedside Index of Severity in Acute Pancreatitis; BP, blood pressure; BUN, blood urea nitrogen; SIRS, systemic inflammatory response syndrome.

Severity of Acute Pancreatitis Three severity classifications have also been defined: mild, moderately severe, and severe. *Mild acute pancreatitis* is without local complications or organ failure. Most patients with interstitial acute pancreatitis have mild pancreatitis. In mild acute pancreatitis, the disease is self-limited and subsides spontaneously, usually within 3–7 days after treatment is instituted. Oral intake can be resumed if the patient is hungry, has normal bowel function, and is without nausea and vomiting. Typically, a clear or full liquid diet has been recommended for the initial meal; however, a low-fat solid diet is a reasonable choice following recovery from mild acute pancreatitis.

Moderately severe acute pancreatitis is characterized by transient organ failure (resolves in <48 h) or local or systemic complications in the absence of persistent organ failure. These patients may or may not have necrosis, but may develop a local complication such as a fluid collection that requires a prolonged hospitalization greater than 1 week.

Severe acute pancreatitis is characterized by persistent organ failure (>48 h). Organ failure can be single or multiple. A CT scan or magnetic resonance imaging (MRI) should be obtained to assess for necrosis and/or complications. If a local complication is encountered, management is dictated by clinical symptoms, evidence of infection, maturity of fluid collection, and clinical stability of the patient. Prophylactic antibiotics are not recommended.

Imaging in Acute Pancreatitis Two types of pancreatitis are recognized on imaging as *interstitial* or *necrotizing* based on pancreatic perfusion. CT imaging is best evaluated 3–5 days into hospitalization when patients are not responding to supportive care to look for local complications such as necrosis. Recent studies report the overutilization of CT imaging in acute pancreatitis and its inability to be better than clinical judgment in the early days of acute pancreatitis management. The revised criteria also outline the terminology for local