TABLE 38-2 PREDICTORS OF SEVERE PANCREATITIS

CRITERIA	PROGNOSTIC INDICATORS
Signs*	Heart rate: >90 beats/min Temperature: >38° C or <36° C White blood cell count: >12,000 or <4,000 cells/μL or >10% bands Respiratory rate >20 beats/min or $Paco_2$ <32 mm Hg
Patient characteristics	Comorbid illnesses Age >55 yr Obesity (BMI >30 kg/m^2)
Laboratory values	BUN level of 20 mg/dL or higher and any rise in BUN during the first 24 hr of admission associated with increased mortality Serum creatinine >1.8 mg/dL within first 24 hr Hemoconcentration with Hct ≥44 on admission or failure of Hct to decrease in first 24-48 hr with volume resuscitation predicts severe pancreatitis Serum marker reflecting a systemic inflammatory response, CRP >150 mg/dL
Imaging findings	Pleural effusion Pancreatic necrosis Acute extrapancreatic fluid collections
Scoring systems	
Ranson's criteria	Eleven prognostic indicators, including five available on admission (age >55 yr, WBC >16,000/mm^3, glucose >200 mg/dL, LDH >350 IU/L, AST >250 U/L) and six measured at the end of the first 48 hr (Hct decreased >10, BUN >5 mg/dL, Po_2 <60 mm Hg, base deficit >4 mEq/L, serum calcium <8 mg/dL, estimated fluid sequestration >6 L); mortality rate of 10-20% for three to five signs and >50% for six or more signs
Acute Physiologic and Chronic Health Evaluation (APACHE II) system	Calculated by assigning points based on age, heart rate, temperature, respiratory rate, mean arterial pressure, Pao_2, pH, potassium, sodium, creatinine, Hct, WBC, GCS, and previous health status
Bedside Index for Severity of Acute Pancreatitis (BISAP)	Five variables available in initial 24 hr: BUN >25 mg/dl, impaired mental status (GCS score <15), finding of SIRS, age >60 yr, and pleural effusion on imaging. Each variable adds 1 point to the total score, and scores of 3, 4, and 5 correspond to mortality rates of 5.3%, 12.7%, and 22.5%, respectively.

AST, Aspartate aminotransferase; BMI, body mass index; BUN, blood urea nitrogen; CRP, C-reactive protein; GCS, Glasgow Coma Scale; Hct, hematocrit; LDH, lactate dehydrogenase; SIRS, systemic inflammatory response syndrome; WBC, white blood cells.
*SIRS predisposes to multiple organ dysfunction and pancreatic necrosis. SIRS is defined by two or more of these criteria persisting for more than 48 hours.

>2.0 mg/L after rehydration). SIRS predisposes to multiple organ dysfunction and pancreatic necrosis.

Well-established scoring systems include Ranson's criteria, Acute Physiologic and Chronic Health Evaluation II (APACHE II), and Bedside Index for Severity of Acute Pancreatitis (BISAP). With increasing scores, the likelihood of a complicated, prolonged, and fatal outcome increases.

Treatment

Early steps in the management of patients with acute pancreatitis can decrease severity, morbidity, and mortality (Fig. 38-4). Prevention of complications depends largely on monitoring, vigorous hydration, and early recognition of pancreatic necrosis and choledocholithiasis. Patients with multiorgan dysfunction and those with predicted development of severe disease are at greatest risk for adverse outcomes and should be treated when possible in a care unit with intensive monitoring capability and multidisciplinary input.

Supportive Care

Patients with acute pancreatitis are treated supportively with aggressive intravenous hydration, parenteral analgesics, and bowel rest. Supplemental oxygen is recommended initially for all patients. Nasogastric tube suction is indicated for symptomatic relief in patients with nausea, vomiting, and ileus. No specific treatments are effective in limiting systemic complications. Agents that put the pancreas to rest (e.g., somatostatin, calcitonin, glucagon, H_2-receptor antagonists) and enzyme inhibitors (e.g., aprotinin, gabexate mesylate) have not been shown to lower disease-related morbidity and mortality.

Antibiotics

Antibiotic therapy is no longer recommended for patients with sterile necrosis due to the lack of proven benefit. For patients with suspected infected necrosis, appropriate antibiotics are initiated before the confirmatory diagnosis, with the initial choice taking into consideration the likely pathogenic organisms and the ability of the antimicrobials to penetrate into necrotic pancreatic tissues. After culture results are available, the antibiotics can be tailored appropriately.

Fluid Management

Vigorous fluid resuscitation is important for maintaining the microcirculation and perfusion of the pancreas during the early phase of acute pancreatitis. Early aggressive intravenous hydration translates into a potential benefit of reduced pancreatic necrosis and organ failure. Crystalloid, the preferred intravenous fluid, is administered at an initial rate of 250 to 500 mL/hour with a preceding bolus infusion for individuals with severe volume depletion. Lactated Ringer's solution may be the preferred crystalloid replacement because in one comparative study, it reduced the incidence of SIRS by more than 80% compared with normal saline infusion. Fluids are adjusted every few hours based on the patient's hemodynamic and volume status. Caution must be used for the elderly and those with underlying cardiovascular or renal impairment.

Analgesia

Despite the theoretical concern that narcotic analgesia may result in sphincter of Oddi spasm and worsening pancreatitis, there is no evidence to support withholding narcotics from patients with acute pancreatitis. The physician should consider liberal use of patient-controlled analgesia, although this approach has not been compared prospectively with on-demand analgesia. There is no evidence to indicate superiority of a specific opiate. Patients administered repeated doses of narcotic analgesics should have oxygen saturation monitored due to risks of unrecognized hypoxia.

Nutritional Care

Patients with mild disease may initiate oral intake when pain resolves and appetite returns. Starting with a low-fat solid diet is as safe as a clear liquid diet. For patients with predicted severe pancreatitis or those unlikely to start oral intake within 5 to 7 days, providing supplemental nutrition is important.