**Management of Acute Pancreatitis (AP)**

**Goal**
Guide clinicians in the diagnosis and inpatient management of patients with acute pancreatitis.

**Key Points**
- Early IV fluids are key for symptom control
- CT is **NOT** required for diagnosis, and may be misleading in early stages of pancreatitis
- RUQ U/S is recommended for all patients
- Prophylactic antibiotics are not required

**Algorithm 1. Initial Management (0-12 hours)**

**Patient presents with signs and symptoms consistent with acute pancreatitis.**

A diagnosis of acute pancreatitis is confirmed if both of these criteria are met:
- Characteristic epigastric abdominal pain.
- Amylase or lipase ≥ 3x upper limit of normal (ULN).
- Serial monitoring of amylase and lipase levels is **NOT** recommended.

**Acute pancreatitis confirmed**

- **Early aggressive IV fluids:**
  - 30 mL/kg bolus (i.e. approximately 2000 mL for 70 kg) then 3 mL/kg/hr (i.e. 200 mL/hr for 70 kg).*
  - LR preferred, but avoid in patients with hypercalcemia.
  - Use with caution in those with history of heart failure or respiratory disease.

- **Symptom control:** NPO, analgesia, antiemetic.

- **Labs should include the following:** BUN, HCT, LFTs, triglyceride (TG), calcium, C-reactive protein.

- **Imaging:**
  - **AVOID** using CT unless the diagnosis is uncertain as it may be misleading in the early stage of disease.
  - RUQ U/S is recommended for all patients.
  - Upright CXR (if abnormal exam or SOB) to evaluate pleural effusion.
  - See page 3 for other imaging indications.

* Recommendation is based on high quality evidence.

**Reassess patient within 4-6 hours**

- **Assess response to fluids:** vitals, urine output, fluid status (avoid fluid overload).

- **Goals:**
  - Decrease in HR.
  - Urine output > 0.5 mL/kg/hr.
  - Decrease in BUN.
  - Decrease in HCT.

- **Consider repeat bolus if these goals are not met.**

**Determine clinical severity to guide subsequent management:**

- Consider comorbidities and pre-existing organ failure (i.e. CHF, CKD).

- **Bedside Index for Severity in Acute Pancreatitis (BISAP) (≥ 3 indicates severe AP):**
  - BUN > 25 mg/dL.
  - Altered mental status based on Glasgow Coma Scale (≤ 5).
  - Systemic Inflammatory Response Syndrome Criteria (SIRS) ≥ 2.
  - Age > 60 years.
  - Pleural effusion on CXR.

- **Revised Atlanta Criteria (≥ 1 indicates severe AP):**
  - Cr > 1.9 (acute).
  - SBP < 90 mmHg (not responsive to fluids).
  - PaO₂/FiO₂ < 300

**Note:** See Algorithm 2 on page 2 for appropriate level of care 12-72 hours after admission.
Algorithm 2. Management at Admission (12-72 hours)

**Mild AP**

- BISAP < 2 and no Atlanta criteria.
- 12-24 hours post arrival
  - Ensure fluid management goals are met:
    - Urine output > 0.5 mL/kg/hr.
    - Decrease in HCT and BUN from admission.
  - 1.5 mL/kg/hr LR with PO as tolerated.
  - **Note:** If SIRS is persistently ≥ 2 at 24 hrs., manage patient as severe.
- 24-72 hours post arrival
  - Fluid management:
    - 1.5 mL/kg/hr or all PO, as tolerated.
  - Diet/nutrition:
    - Start with clear liquids, soft, and low fat food.
    - Early oral feeding; advance as tolerated.
  - Antibiotics:
    - Not routinely indicated.
  - Consults:
    - Gastroenterology for questions regarding management.
    - Outpatient referral is recommended for patients not evaluated by GI during the hospitalization.

**Moderate/Severe AP**

- BISAP ≥ 3 or ≥ 1 Atlanta criteria.
- 12-24 hours post arrival
  - Ensure fluid management goals are met:
    - Urine output > 0.5 mL/kg/hr.
    - Decrease in HCT and BUN from admission.
  - 3.0 mL/kg/hr LR, decrease to 1.5 mL/kg/hr once goals are met.
- 24-72 hours post arrival
  - Fluid management:
    - 3.0 mL/kg/hr, decrease to 1.5 mL/kg/hr once goals are met.
  - Diet/nutrition:
    - Consider NG or NJ if unable to take PO 48 hrs. after arrival.
    - Parenteral should be avoided, unless no alternatives.
  - Antibiotics:
    - Prophylactic antibiotics are **NOT** required.*
    - Consider empiric antibiotics for suspected infection with clinical decompensation.
  - Consults:
    - Gastroenterology
    - Hepatobiliary and Pancreatic Surgery (HPB).
    - Consult Nutrition if placing feeding tube
  - Management of complications:
    - There is no utility in monitoring serial serum amylase or lipase after admission.
    - If there is no improvement by 72 hrs., consider CT scan with IV contrast.
    - Asymptomatic fluid collections do not require intervention regardless of size, location, or extension.
    - If there is evidence of infected necrosis:
      - **Start antibiotics:** high dose cephalosporin, or carbapenem, or cipro and flagyl.
      - Defer drainage 4-6 weeks to allow minimally invasive approach.*

* Recommendation is based on high quality evidence.
Indications for Imaging

- **RUQ US**
  - Recommend as the initial imaging test for all patients to assess for gallstones.

- **CT (IV contrast, PO unnecessary)**
  - Only on admission if diagnosis is uncertain and no alternative diagnosis is more likely.
  - After 48–72hrs, CT with IV contrast can demonstrate local complications, including necrosis.
    - CT within 2–3 days may underestimate severity and may not detect necrosis.

- **MRI with contrast and MRCP**
  - At 48–72hrs, can be used to evaluate for retained common bile duct stone.
  - Permits characterization of peripancreatic fluid collections.
  - Not indicated in mild AP.

- **EUS**
  - Can evaluate for stones or ampullary mass.
  - EUS is most helpful during the outpatient evaluation.

- **ERCP**
  - Emergent: for ascending cholangitis.
  - Urgent: for treatment of choledocholithiasis.

Local Complications/Fluid Collections

- The management of peripancreatic fluid collections is beyond the scope of these guidelines. Due to the complexity of these clinical scenarios, treatment plans should be developed by a multidisciplinary team.

- **Acute peripancreatic fluid collection**
  - Occur early in mild, interstitial acute pancreatitis.
  - Typically sterile.
  - Do not have a well-defined wall.

- **Pancreatic pseudocyst**
  - Large peripancreatic fluid collections can develop after 4–6 weeks.
  - Typically sterile.
  - Have a well-defined wall and contain essentially pure fluid.
  - Do not require intervention unless patient is symptomatic.

- **Acute necrotic collection**
  - Occur early in severe acute pancreatitis with necrosis of the pancreatic or extrapancreatic tissue.
  - Heterogenous appearance and do not have a well-defined wall.

- **Walled off pancreatic necrosis**
  - Acute necrotic collection can progress into this after 4–6 weeks.
  - Have a well-defined wall and contains variable amounts of debris.
    - Solid components are best seen on MRI.
  - Intervention is reserved for symptomatic patients.

Potential Etiologies

- **Gallstones (40–70%):**
  - Strongly consider diagnosis if ALT is ≥ 3x ULN (PPV 95%).
  - For mild gallstones/pancreatitis:
    - Recommend same admission cholecystectomy.
  - For severe gallstone pancreatitis including necrosis:
    - Delay cholecystectomy for 4 weeks and consider sphincterotomy if patient is a poor surgical candidate.

- **Alcohol (25–35%):**
  - Requires heavy, chronic alcohol use.
  - Follow CIWA protocol and provide supportive care.
    - OSUWMC Alcohol Withdrawal guideline.

- **Metabolic (1–4%):**
  - Hypertriglyceridemia:
    - Check TG on admission and if > 1,000 mg/dL, then consider diagnosis.
    - Consider Endocrinology consultation.
  - Hypercalcemia:
    - Avoid LR resuscitation (contains Ca++).
    - Workup underlying cause.
    - Consider Endocrinology consultation.

- **Idiopathic:**
  - Diagnosis of exclusion.
  - Requires follow-up in Pancreas Clinic.

- **Autoimmune:**
  - This is a rare etiology.
  - No need to check IgG4 levels as an inpatient.
  - Requires follow-up in Pancreas Clinic.

+ Recommendation is based on high quality evidence.
Discharge Planning

**All Patients:**
- Adequate nutritional intake (PO or other arrangements).
- Alcohol and tobacco free indefinitely.
- Control of GI symptoms:
  - Consider exocrine insufficiency (steatorrhea).
  - Consider endocrine insufficiency (diabetes).

**By Etiology:**
- **Gallstones:**
  - Same admission cholecystectomy is recommended for mild gallstone pancreatitis. See gallstone section (p. 3) for other scenarios.
- **ETOH:**
  - Social work consult.
  - Plan for sobriety.
  - Very high recurrence of AP with continued ETOH abuse, especially when combined with smoking.
- **Elevated TG:**
  - Endocrine and PCP follow-up.
  - Recommend starting anti-cholesterol regimen prior to discharge.
- **Drug-induced Pancreatitis:**
  - Stop offending medications.
  - If pharmacologic support is still required, replace old medications with those less likely to cause pancreatitis.
- **Idiopathic:**
  - Follow-up in Pancreas Clinic for additional testing.

**References**


**Quality Measures**

- Patients with an abdominal CT within 0-6 hours of arrival, 6-12 hours, and > 12 hours
- Patients with an ultrasound within first 72 hours of admission.
- Length of stay.
- Patients readmitted within 30 days.
- Mortality rate.
- Number of days patient is NPO.

**Order Sets**

- Admission Acute Pancreatitis [5769]

**Guideline Authors**

- Philip Hart, MD
- Mitchell Ramsey, MD
- Darwin Conwell, MD
- Zarine Shah, MD
- Andrei Manilchuk, MD

**Guideline Approved**


**Disclaimer:** Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC’s guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.