Building a Quality Practice in Chronic Pancreatitis

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Abstract: Chronic pancreatitis (CP) is a fibroinflammatory disorder that results in irreversible scarring to pancreatic parenchyma and presents with a myriad of symptoms including abdominal pain, nausea, weight loss, steatorrhea, and diabetes. Furthermore, patients with CP often have comorbid chemical dependencies to alcohol and tobacco, which can further complicate the management of CP. Recent literature proposes guidelines on how best to care for patients with CP and establishes requirements for centers of excellence. Here, we review the available data on endoscopic therapies, pain management, chemical dependency, and nutrition for patients with CP and propose quality metrics that may be used to establish a quality practice.

Key Words: chronic pancreatitis, quality metrics, multidisciplinary care

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Chronic pancreatitis (CP) is a progressive inflammatory disease that results in irreversible damage to acinar, islet, and ductal cells. Clinically, patients present with unrelenting abdominal pain, nausea, vomiting, steatorrhea, and diabetes.[1] In some cases, patients may progress to pancreatic cancer leading to death within a few months of diagnosis. Patients with CP often have comorbid conditions including obesity, coronary disease, mental health disorders, and chemical dependencies, which further complicate the care they require. Furthermore, as a result of their underlying pancreatic disease, patients can develop significant nutritional deficiencies and bone disease, which also require close monitoring.[2]

Together, these complex issues pose a challenge when attending to patients with CP and require the coordinated effort of multiple specialties to provide comprehensive care (Fig. 1). These challenges have also led to the establishment of academic centers of excellence and clinical guidelines aimed to optimize care for patients with CP.[3–6] In this review, we highlight the key components of designing and implementing a practice focused in delivering high-quality care for patients with CP with a particular focus on patient-centered care. In discussing this design model, we conclude this review with proposing quality metrics aimed to focus practices on optimized care for patients with CP.

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INITIAL STRATEGY

As the care for patients with CP is dependent on the expertise from multiple disciplines, a crucial step in developing a quality practice must include assembling a group of key stakeholders. As depicted in Figure 1, this often includes finding colleagues in gastroenterology (both medical pancreatologists and advanced endoscopists), primary care, surgeons with experience in pancreatic disease, pain management providers, behavioral health providers with experience in chemical dependency and comorbid mental health diagnoses, endocrinology (for both diabetes and bone disease), abdominal radiologists, and dieticians. Once the team is set, this group will serve as the main resources for the quality practice.

Diagnosis of CP

Abdominal pain is the predominant manifestation for CP and can be unrelenting, debilitating, and difficult to treat. Hence, it is important to confirm the diagnosis, especially if there remains a strong clinical suspicion for the diagnosis of CP, despite the normal standard cross-sectional imaging. In this situation, experts recommend a combination of advanced tests such as endoscopic ultrasonography, secretin-enhanced magnetic resonance cholangiopancreatography (S-MRCP), and pancreatic function testing.

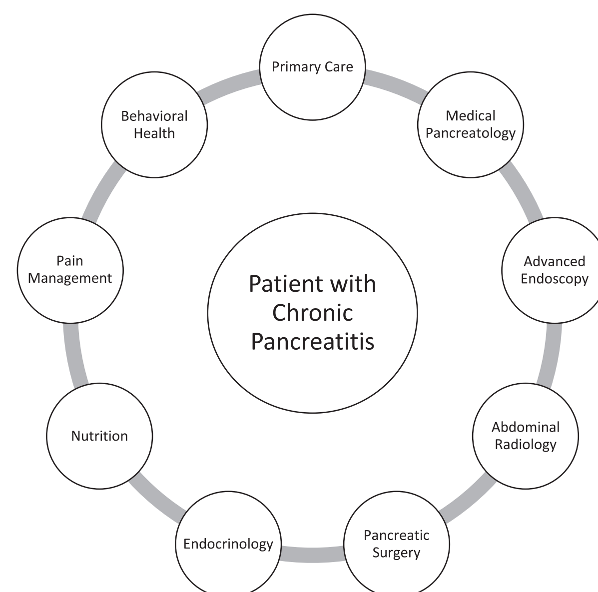

FIGURE 1. Multidisciplinary care model for patients with chronic pancreatitis.

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Endoscopic ultrasound is a mainstay in the algorithm for the diagnosis of CP and is often used when cross-sectional imaging does not provide a diagnosis of CP; however, there is still high clinical suspicion. Because of the high sensitivity of this examination, centers will often use either minimal standard terminology or the Rosemont criteria to diagnose CP. Furthermore, endoscopic ultrasound provides an additional advantage of need biopsy if it is needed. Because of the invasive nature and risk of pancreatitis, this is often used when there is a high suspicion for adenocarcinoma. In S-MRCP, administration of secretin releases bicarbonate and water from ductal cells and flushes pancreatic juice into the duodenum. This allows for visualization of the pancreatic ducts and quantification of duodenal filling, defining the morphology and function of the pancreas. The diameter of the main PD and volume of duodenal fluid are the 2 best studied features in CP. The biggest advantage of S-MRCP is that it is noninvasive, without radiation, and safe in patients with contrast allergy.[5] Although useful, S-MRCP is a specialized examination that requires the expertise of skilled radiologists to provide accurate interpretation. Lastly, secretin pancreatic function testing utilizes pancreatic physiology to determine ductal function by measuring duodenal bicarbonate concentration. Peak values that are > 80 mEq/L have a 97% negative predictive value in ruling out CP. This test, only offered in specialized centers, is used when findings from other diagnostic testing are indeterminate for CP.

Pain Management

Although the pathophysiology pain is not entirely understood, it is believed to be the result of pancreatic inflammation, pancreatic duct obstruction and destruction, and nerve sensitization.[7,8] Three different pain patterns have been described. Type A, in which patient has intermittent severe episodes, but is pain free in between episodes. Type B when there is persistent pain in between intermittent severe episodes, and type C is when there are no intermittent flares, but instead there is constant severe pain.[9] Constant pain compared with intermittent pain is the most important from a patient perspective, as it is an independent predictor of poor quality of life, higher disability, increased admissions, and more opioid use.[10] Clinically, in addition to characterizing type and intensity, pain should be assessed by the traditional visual analogue scale or a numeric rating scale. Response to analgesia and improvement in pain scores should be recorded as part of the interval history at each office visit. More accurate pain assessment may be performed by using pancreatic quantitative sensory testing, which utilizes cold pressor test, repetitive pinprick stimuli, and upper abdominal pressure stimulation to classify patients into distinct pain phenotypes. Furthermore, there are promising questionnaires in development aimed to more accurately qualify pain perceptions. The latter 2 methods are currently used for research purposes.[11]

Thus, approaches to pain management often require a multidisciplinary approach. Initially, high-quality imaging and conferring with radiology will identify whether patients may be candidates for endoscopic or surgical procedures to treat pancreatic duct obstructions.[12] Randomized controlled trials, including 2020 Dutch trial, demonstrate that early surgery is superior to in achieving pain control compared with endoscopic treatment with or without extracorporeal shock wave lithotripsy.[13] In the 2020 Dutch trial, the early surgery group had significantly lower pain scores and number of interventions. Although not statistically significant, there was a higher proportion of patients with partial or complete pain relief in the surgical group. There was no difference in the complications, mortality, admissions, pancreatic function, or quality of life. Follow-up analysis showed that surgery was more cost-effective than endoscopic therapy in this trial. However, in clinical practice, a step-up approach utilizing endoscopic therapy before surgical therapy is more common.

Patients should be referred to an advanced endoscopy team for endoscopic therapy with or without extracorporeal shock wave lithotripsy in patients with uncomplicated painful CP with an obstructed main pancreatic duct, symptomatic pseudocysts, and biliary strictures with jaundice or liver function test abnormalities.[5,14] The European Society for Gastrointestinal Endoscopy recommends specific approaches for different clinical situations, which are outlined in Table 1.[14] Referral for surgery should be made when endoscopic options are exhausted or unsuccessful, especially in patients with intractable pain, local complications,

TABLE 1. Endoscopic Management of Pain in Chronic Pancreatitis (CP)

Clinical condition	Intervention	Evidence
1. Painful uncomplicated CP with obstructed main pancreatic duct in head/body	Endoscopic therapy with or without ESWL	Weak recommendation with low-quality evidence
2. Clearance of pancreatic duct stones	ESWL is recommended first for radiopaque stone > 5 mm in head/body of MPD ERCP for translucent or < 5 mm stone in MPD	Strong recommendation with moderate quality of evidence
3. No spontaneous clearance of stone after adequate fragmentation	Restrict ERCP to after ESWL is performed first	Weak recommendation with moderate-quality evidence
4. Painful main pancreatic duct strictures	Single 10 French plastic stent for 1 y-change in 6 mo or for stent dysfunction Surgery/multiple stents if stricture persists after 1 y	Weak recommendation with low-quality evidence
5. Uncomplicated symptomatic pseudocysts secondary to CP	Endoscopic therapy with plastic or metal stents should be performed before percutaneous treatment or surgery	Strong recommendation with low quality of evidence
6. Benign biliary strictures secondary to CP	Placement of multiple plastic stents or a fully covered metal stent	Strong recommendation with low quality of evidence

Adapted from Dumonceau et al.[14] Adaptations are themselves works protected by copyright. So in order to publish this adaptation, authorization must be obtained both from the owner of the copyright in the original work and from the owner of copyright in the translation or adaptation.

ERCP indicates Endoscopic Retrograde Cholangiopancreatography; ESWL, extracorporeal shock wave lithotripsy; MPD, main pancreatic duct.

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suspicion for malignancy, and when the head of the pancreas is abnormal with a dilated main pancreatic duct.[15] Referral for total pancreatectomy with or without islet cell autotransplantation should be made in case of hereditary CP to decrease the risk of pancreatic cancer and to preserve islet cell function before fibrosis sets in.[16] However, when patients either do not have targets for therapy or are not procedural candidates, medical therapy becomes the mainstay of therapy.

Traditionally, patients with CP will receive acetaminophen for the initial pain management; however, when this fails, nearly two thirds of patient will receive opioids.[17,18] Although effective at treating the symptom, opioids do not treat the underlying cause for pain. Furthermore, as opioid use disorder contributes to significant deaths in the United States yearly, close monitoring is necessary to ensure its proper use.[19] Screening tools, often utilized by pain management providers, can provide predictive data on misuse and has been used in patients with nonalcoholic CP.[20] In addition to screening tools, state and federal monitoring platforms allow providers to close track opioid prescriptions to further mitigate the risk of overuse.[21] Lastly, providers can often use urine drug screens to ensure proper use of the opioid and screen for concurrent chemical dependencies.[22] In treating patient's pain, engaging pain management early can provide critical support in managing pain both safely and adequately. Moreover, pain management providers can also provide guidance on non-narcotic therapy, including tricyclic antidepressants and gabapentoids, which guidelines recommend over the use of opioids.[5] Thus, a key measure in building a quality metric should include referrals to pain management at the outset of evaluation.

Chemical Dependency and Mental Health

Alcohol and tobacco use are important toxic factors to consider when managing patients with CP. It is well established that patients who engage in heavy alcohol use are at higher risk of developing CP.[23] Although there is limited data on whether alcohol cessation alters the natural history of CP, studies including some randomized trials demonstrate that cessation reduces hospitalizations and improves pain.[24,25] Thus, most guidelines recommend alcohol cessation.

Similarly, tobacco use is an established risk factor for the development of CP and importantly also increases the risk of progression to pancreatic cancer by nearly 2 times.[17,26–28] Cessation seems to reduce the progression of calcific CP as documented in one case series and also reduces the risk of pancreatic cancer.[28,29] As with alcohol, tobacco cessation also remains an important intervention for patients with CP.

It is recognized that patients with chemical dependency require intensive attention to have sustained success. Behavioral health specialists are invaluable in these settings, as they have the expertise to deploy strategies in aiding patients in remaining sober from toxic ingestion. Thus, a quality program should have access to behavioral health specialists and/or cessation programs to serve as resources for patients with CP who have concurrent chemical dependency.

Nutrition and Exocrine Pancreatic Insufficiency

As patients with CP progress, acinar cell destruction can lead to insufficiency in pancreatic enzymes resulting in critical maldigestion, steatorrhea, and malnutrition. Often, this can manifest in myriad symptoms including nausea, bloating, early satiety, malodorous gas, weight loss, fatigue, and bone fractures. In addition, patients can develop severe micronutrient deficiencies, which can hinder critical bodily processes. Guidelines recommend for these reasons to screen patients for exocrine pancreatic insufficiency (EPI) along with other nutritional deficiencies.[5] When CP patients are seen in follow-up, laboratory testing should include complete blood count, metabolic profile, liver function tests, international normalized ratio, vitamin D, B_{12}, and albumin levels, if indicated. Baseline and subsequent nutritional evaluation should be recorded, including weight, body mass index, and hand grip testing for muscle wasting (sarcopenia).[4] For patients who develop EPI, pancreatic enzyme replacement therapy (PERT) is essential to reverse the effects of malabsorption and to improve the quality of life.[30] Trained gastroenterologists with dieticians are key in the management of EPI to provide guidance on PERT dosing and meal preparation.[15] The normal pancreas produces 90,000 USP units of lipase with each meal.

Therefore, the starting dose of PERT should be at least 40 to 50,000 units of lipase with each meal and half the amount with snacks. Up to 70% of patients may still have some degree of steatorrhea. If there is lack of response, one should increase the dosage of PERT, check compliance, add acid inhibitor, add extra enzymes toward the end of the meal, and rule out contributing factors, such as small intestinal bacterial overgrowth, which may be present in up to 40% of patients with CP. In addition to PERT and diet management, patients with EPI require periodic monitoring for vitamin deficiencies and associated downstream effects of these deficiencies, namely bone disease. Thus, baseline bone scans are recommended and engagement with endocrinology can help mitigate the risks of bone fractures.

Summary of Proposed Quality Metrics for Patients With Chronic Pancreatitis

Patients with CP with complex care requirements are best served with a multidisciplinary team who focuses on symptom reduction and risk mitigation. Thus, we propose the following quality metrics for centers to measure in an effort to improve the quality of care delivered.

(1) Patients with CP who present with pain are referred to pain management for comprehensive evaluation before the use of sustained opioids.
(2) Patients with CP who have a history of chemical dependency are referred to behavior health and/or cessation programs.
(3) Patients with CP and EPI undergo screening for nutritional deficiencies and a baseline bone density and be referred to nutrition and endocrinology if needed.

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