International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

Scholarly Publisher
RS Global Sp. z O.O.
ISNI: 0000 0004 8495 2390

Dolna 17, Warsaw,
Poland 00-773
+48 226 0 227 03
editorial_office@rsglobal.pl

ARTICLE TITLE	A MULTIDISCIPLINARY APPROACH TO THE TREATMENT OF CHRONIC PANCREATITIS
DOI	https://doi.org/10.31435/ijitss.3(47).2025.3806
RECEIVED	30 July 2025
ACCEPTED	20 September 2025
PUBLISHED	29 September 2025
LICENSE	The article is licensed under a **Creative Commons Attribution 4.0 International License.**

A MULTIDISCIPLINARY APPROACH TO THE TREATMENT OF CHRONIC PANCREATITIS

Julia Czerwik *(Corresponding Author, Email: julia.czerwik26@gmail.com)*
The National Medical Institute of the Ministry of Interior and Administration, Warsaw, Poland
ORCID ID: 0000-0001-7241-194X

Katarzyna Krzemińska
Medical University of Lublin, Lublin, Poland
ORCID ID: 0009-0004-4988-7295

Maria Kubas
Medical University of Lublin, Lublin, Poland
ORCID ID: 0009-0005-1306-9132

Julia Kuszneruk
Medical University of Lublin, Lublin, Poland
ORCID ID: 0009-0001-5508-5027

Joanna Dmochowska
The University Clinical Centre, Gdańsk, Poland
ORCID ID: 0000-0003-0396-2363

Marta Czubala
Holy Spirit Specialist Hospital, Sandomierz, Poland
ORCID ID: 0000-0001-8978-1867

Aleksandra Kaźmierczyk
1st Military Clinical Hospital with the Outpatient Clinic, Lublin, Poland
ORCID ID: 0009-0007-7283-2518

Jędrzej Kęsik
1st Military Clinical Hospital with the Outpatient Clinic, Lublin, Poland
ORCID ID: 0000-0001-8317-0213

Patrycja Felisiak
Medical University of Lublin, Lublin, Poland
ORCID ID: 0009-0004-4968-0331

Karol Kanon
The University Clinical Centre, Gdańsk, Poland
ORCID ID: 0000-0001-6705-1302

ABSTRACT

Chronic pancreatitis (CP) is a progressive inflammatory disease of the pancreas that leads to irreversible structural damage, abdominal pain, and exocrine and endocrine insufficiency. Its etiology is multifactorial, with alcohol consumption and cigarette smoking representing the most significant modifiable risk factors, while genetic, autoimmune, and metabolic mechanisms are increasingly recognized. The aim of this review was to summarize current knowledge on the pathogenesis, diagnosis, and management of CP, with particular emphasis on the importance of an interdisciplinary approach. A comprehensive literature focused on original studies, clinical guidelines, and meta-analyses published in the last 15 years. Effective management of CP requires a stepwise strategy, beginning with lifestyle modification, pain control, pancreatic enzyme replacement therapy, and management of diabetes. Endoscopic and surgical procedures are reserved for patients with refractory symptoms, with duodenum-preserving techniques demonstrating favorable outcomes in pain relief, pancreatic function preservation, and quality of life. In advanced disease, surgical management provides superior long-term results compared with endoscopy. In addition, psychological care has emerged as an integral part of management, addressing the burden of chronic pain, comorbid depression, and addictive behaviors. Nutritional support, including adequate enzyme supplementation and correction of fat-soluble vitamin deficiencies, remains essential to prevent malnutrition and osteoporosis. In conclusion, CP is a complex disorder requiring multidisciplinary care. Early recognition of risk factors, combined with individualized therapeutic strategies and integration of medical, surgical, and psychosocial interventions, is fundamental to improving patient prognosis and quality of life.

KEYWORDS

Abdominal Pain, Chronic Pancreatitis, Exocrine Pancreatic Insufficiency, Pancreatic Diabetes, Pancreatic Enzymes

CITATION

Julia Czerwik, Katarzyna Krzemińska, Maria Kubas, Julia Kuszneruk, Joanna Dmochowska, Marta Czubala, Aleksandra Kaźmierczyk, Jędrzej Kęsik, Patrycja Felisiak, Karol Kanon. (2025) A Multidisciplinary Approach to the Treatment of Chronic Pancreatitis. *International Journal of Innovative Technologies in Social Science*. 3(47). doi: 10.31435/ijitss.3(47).2025.3806

Introduction

Chronic pancreatitis is a debilitating disease in which a chronic inflammatory process leads to irreversible replacement of the organ parenchyma by connective fibrous tissue. It is accompanied by abdominal pain and progressive failure of the extra- and endocrine pancreatic function. Chronic pancreatitis is a rare disease. Due to the rather diverse diagnostic criteria for CP, reliable epidemiological data are scarce. It is estimated that the incidence and prevalence rates are approximately 25/100,000 and 92/100,000, respectively. The pathogenesis of the disease has not been fully explained. We distinguish risk groups, organised in the TIGARO classification, that may interact to produce pancreatic disease: toxic-metabolic, idiopathic, genetic, autoimmune, recurrent and severe acute pancreatitis - associated CP, and obstructive etiologic factors. It should be noted that in a single patient, several factors simultaneously usually contribute to the development of the disease. Among toxic-metabolic factors, alcohol and smoking play the most significant role. It is believed that alcohol sensitises the pancreas to damage rather than directly causing CP, but it also influences the progression of the disease. Approximately 60-85% of cases are related to alcohol consumption. The type of alcohol consumed is not important, but the amount and frequency of consumption do play a role. It is assumed that patients must have 4-5 alcoholic drinks a day for more than 5 years to be at risk. On the other hand, less than 5 percent of alcohol abusers suffer from chronic pancreatitis, which confirms that more than one factor contributes to the development of this disease. The latest results of clinical control studies suggest that smoking is an independent risk factor for the development of acute (AP) and chronic (CP) pancreatitis. It is estimated that as many as 46% of all cases of this disease can be attributed to cigarette smoking. Recent reports indicate that the harmful effects of smoking are associated with the induction of interleukin-22 (IL-22) in response to the presence of aromatic hydrocarbons, which promote pancreatic fibrosis. Furthermore, it should be noted that smoking cigarettes increases the risk of pancreatic cancer. Other toxic-metabolic factors include hypercalcaemia, hypertriglyceridemia and medications. Although chronic pancreatitis has traditionally been

classified as alcoholic or idiopathic, a genetic basis is now being identified in an increasing number of patients. Strong associations with chronic pancreatitis have been found in genetic variants in the PRSS1 (cationic trypsinogen) SPINK1 (serine protease inhibitor Kazal type 1) and CFTR (cystic fibrosis transmembrane conductance regulator) genes, and to a lesser extent also in CTRC (chymotrypsin C) and CASR (calcium-sensing receptor) genes. So-called hereditary pancreatitis, associated with a mutation in the PRSS1 gene, is inherited in an autosomal dominant manner and is characterised by high penetration (~80%), although it is worth noting that in some patients the mutation may appear de novo. A separate mention should be made of autoimmune pancreatitis (AIP), which accounts for approximately 5-6% of all CP cases. We distinguish two subtypes: type 1 AIP (lymphoplasmacytic sclerosing pancreatitis) and type 2 AIP (idiopathic ductcentric pancreatitis). Due to the mechanism of disease development in this case, causal treatment is possible, but it will not be discussed in detail in this paper. Therapeutic management of CP focuses on symptomatic treatment, including pain management, pancreatic enzyme replacement therapy, correction of carbohydrate metabolism disorders, prevention of malnutrition, and treatment of complications. In some cases, invasive treatment, both endoscopic and surgical, is necessary. (1, 2, 3, 4, 5)

Methodology

A narrative review of the literature was performed through searches of PubMed, Scopus, and Web of Science. The search included original studies, randomized controlled trials, clinical guidelines, and systematic reviews on chronic pancreatitis, with emphasis on pain management, pancreatic insufficiency, nutritional aspects, and surgical and endoscopic interventions. Publications from **2011 to 2025** were prioritized, while earlier landmark randomized trials were selectively included to provide historical context. Only peer-reviewed articles in English were considered.

Management of Chronic Pancreatitis

1 Lifestyle changes and psychological care

In patients with chronic pancreatitis (CP), appropriate lifestyle changes and a properly balanced diet are crucial in order to reduce the symptoms of the disease, improve nutritional status and prevent complications such as malnutrition, diabetes and osteoporosis. One of the most important recommendations is to completely stop drinking alcohol, regardless of the amount and type, as even small doses can exacerbate pancreatic damage. It is equally important to stop smoking, which reduces the likelihood of developing pancreatic cancer. The effect of these changes on pain is variable; some patients experience some pain relief after stopping alcohol consumption and smoking. The diet in CP should be easily digestible, nutritious and individually tailored to the patient's condition and the possible presence of exocrine pancreatic insufficiency (EPI) or diabetes. It is recommended to eat 5-6 smaller meals a day, which promotes better digestion and reduces the burden on the pancreas. The amount of fat consumed should not be limited, but the dose of pancreatic enzymes should be adjusted to prevent fatty diarrhoea. However, if severe steatorrhoea persists despite proper enzyme therapy, a reduction in fat intake should be considered. People taking pancreatic enzymes as part of replacement therapy should also avoid fibre-rich foods, as fibre can weaken the effect of the enzymes. In patients with insulin-dependent pancreatic insufficiency, a healthy lifestyle, limiting the consumption of foods with a high glycaemic index, physical activity, abstinence from alcohol and quitting smoking can improve glycaemic control and reduce the risk of hypoglycaemia. (6,7)

In chronic pancreatitis, psychological care is also recommended due to chronic pain, reduced quality of life, frequent co-occurrence of depression and anxiety, as well as possible addictions (e.g. to alcohol). Psychological support helps patients cope better with the disease, adhere to therapeutic recommendations, and improve their overall mental and social functioning.(8)

2 Pain management

Chronic abdominal pain can affect up to 80% of patients.The pain associated with chronic pancreatitis has complex causes and results from both inflammatory processes and neuropathic components. In the past, the prevailing view was that the main source of pain was obstruction of the pancreatic duct caused by its narrowing or the presence of deposits, leading to increased pressure and local ischaemia. However, numerous studies have shown no clear correlation between pain and the presence of strictures or duct dilation. Another possible cause of pain is complications of CP, such as pseudocysts, compression of the bile ducts or duodenum, and the development of secondary pancreatic cancer. In addition, recent scientific reports emphasise the important role of neuropathy as the third mechanism underlying pain. Hyperalgesia and allodynia may also

develop. Long-term pain has serious consequences for health, causing sleep and appetite disorders, a noticeable reduction in quality of life and mental disorders, including depression and anxiety. In patients with CP the aim of therapy is to reduce and control pain rather than eliminate it completely. Treatment methods should be introduced gradually, starting with lifestyle changes and general recommendations, through painkillers, to invasive methods. This section will describe pharmacological methods. (9, 10)

Paracetamol is recommended as a first-line analgesic for managing mild to moderate pain associated with chronic pancreatitis. While it is considered safe for use in these patients, it usually does not provide adequate pain relief when used alone. The best results are typically achieved when it is combined with other analgesic agents. On the other hand, nonsteroidal anti-inflammatory drugs (NSAIDs) should generally be avoided, as patients with chronic pancreatitis are at increased risk of developing gastric and duodenal ulcers. Opioid analgesics are also used to treat pain, but due to the risk of addiction, they should be used with caution, especially in patients addicted to alcohol. The opioid of choice is tramadol, which is initially administered in doses ranging from 200 to 400 mg. Co-analgesics, which include pregabalin, gabapentin and antidepressants, especially serotonin and noradrenaline reuptake inhibitors (SNRI), are also used in the treatment of pain. A randomised, controlled clinical trial showed that patients receiving pregabalin (up to 300 mg twice daily) experienced less pain than those receiving placebo and were also able to reduce their use of opioid medications. In selected patients, pancreatic enzyme supplementation may provide relief from pain associated with diarrhoea and abdominal cramps resulting from exocrine pancreatic insufficiency. Other methods used in the treatment of CP-induced pain include antioxidant therapy. However, the results of studies on the outcomes of such treatment are unclear. (11, 12)

In a 2014 meta-analysis of nine randomised trials, antioxidants showed pain-relieving effects, but their effect was relatively small. A combination of vitamin E (200 international units [IU]), vitamin C (500 mg), beta-carotene (5000 IU), selenium (500 mcg) and methionine (1000 mg) is typically used. (13)

3 Exocrine pancreatic insufficiency

There are two components to the treatment of exocrine pancreatic insufficiency (EPI): pancreatic enzyme replacement therapy and supplementation of fat-soluble vitamin deficiencies. In people with mild exocrine pancreatic insufficiency, symptoms may not occur or may be limited to mild abdominal discomfort and bloating with normal bowel movements. In advanced insufficiency, there are disturbances in the digestion of fats and proteins, overt steatorrhea and weight loss. EPI is a late complication, because of the pancreas's functional reserve, it develops approximately 10 years after the onset of the disease and the loss of 90% of the gland's function. Ultimately, over 70% of people with chronic pancreatitis develop exocrine pancreatic insufficiency during their lifetime. A reduced fat absorption coefficient (CFA) is widely recognised as the gold standard in the diagnosis of exocrine pancreatic insufficiency. However, despite its high accuracy in detecting fat malabsorption, this test is rarely used in everyday clinical practice due to the difficulty of collecting stool samples over a 72-hour period. Currently, the most popular test used to assess EPI is the measurement of elastase in faeces. Pancreatic enzyme replacement therapy (PERT) is recommended in cases of clinical symptoms of malabsorption syndrome (progressive weight loss, fatty diarrhoea, bloating) or anthropometric and/or biochemical signs of malnutrition (low serum concentrations of fat-soluble vitamins, prealbumin, retinol-binding protein and magnesium), preferably together with abnormal pancreatic function test results. The use of lipase is of utmost importance. Initially, a dose of 25,000–50,000 (500 units of lipase per kg body weight per meal) lipase units is used during meals, as well as 50% of the dose during meals in the case of snacks. It is recommended to use preparations in the form of microspheres or minimicrospheres with a diameter of <2 mm, coated with a gastric juice-resistant coating, releasing their contents in the duodenum. The capsules should be administered during meals (not before or after) for best results. In severe cases of exocrine pancreatic insufficiency, the maximum recommended doses of pancreatic enzymes are used – up to 2,500 lipase units per kilogram of body weight per meal or a maximum of 10,000 lipase units per kilogram of body weight per day. It is worth considering adding drugs that inhibit gastric acid secretion to the treatment – proton pump inhibitors or H2 blockers. The most important indicator of treatment effectiveness is clinical improvement and resolution of symptoms. In the case of EPI, supplementation may be required for fat-soluble vitamins (A, D, E and K), as well as deficiencies in calcium, magnesium, zinc, thiamine and folic acid. Particular attention should be paid to the risk of osteoporosis, which is three times higher in patients with CP than in the general population. (14, 15, 16, 17, 18)

4 Pancreatic endocrine insufficiency

Diabetes occurs in CP due to the loss of the total mass of pancreatic islet cells, not only beta cells, and is considered a secondary complication of various pancreatic disorders.Diabetes associated with chronic pancreatitis (CP-DM) is the most common form of pancreatic diabetes, also known as type 3c diabetes.After many years of illness, it occurs in up to 80% of patients. Due to the high risk of developing the disease, annual screening for diabetes is recommended. Diabetes associated with CP is diagnosed according to the same general criteria as for other forms of the condition. Proper pancreatic enzyme supplementation plays an important role in treatment. In cases of mild hyperglycemia, when insulin resistance is present or suspected, the first-line drug of choice – unless contraindicated – is metformin. There are indications that metformin may reduce the risk of developing secondary pancreatic cancer. However, some patients will require insulin treatment. It should be remembered that in the case of CP-DM, lower doses of insulin are used due to low demand and a higher risk of hypoglycaemia. Glucagon-like peptide-1 receptor agonists (GLP-1 analogues) and dipeptidyl peptidase-4 inhibitor (DPP-4 inhibitors) have not been thoroughly tested in patients with chronic pancreatitis and are usually avoided due to the potential danger of inducing acute pancreatitis. (19, 20)

5 Endoscopic treatment

Endoscopic methods used in CP include removal of deposits from the pancreatic duct, insertion of a stent into the pancreatic duct, sphincterotomy of the major (and possibly minor) duodenal papilla, treatment of common bile duct strictures, and treatment of pseudocysts. It is crucial to select patients who are suitable for this treatment method. Patients who achieve the best results have clear signs of duct obstruction, such as dilation of the main pancreatic duct and the presence of a stricture or stone in the head of the pancreas, located close enough to the end of the endoscope to allow for effective treatment. Blocked deposits require treatment with extracorporeal or intraductal lithotripsy. The most commonly used and most readily available method is intraductal lithotripsy, performed using endoscopic retrograde cholangiopancreatography (ERCP). A large study involving eight highly specialised clinical centres showed that approximately 25% of patients ultimately required surgical treatment due to the ineffectiveness of endoscopic therapy in relieving pain, while approximately two-thirds of patients experienced improvement in pain symptoms in an analysis consistent with the intention to treat. (21, 22, 23, 24)

It is also possible to perform a celiac plexus block, which alleviates pain for 3–6 months, but only allows for a reduction in the dose of pain medication. This procedure should be considered in patients for whom other methods of pain management are ineffective. The celiac plexus block can be performed under computed tomography (CT) or endoscopic ultrasound (EUS) guidance, with EUS being considered safer and more effective. However, the efficacy and benefits of EUS-guided celiac plexus block in the treatment of chronic pancreatitis have not yet been thoroughly evaluated. Celiac plexus neurolysis is not generally used in CP. (25)

6 Surgical treatment

Surgical treatment is mainly used in cases of chronic, persistent pain that cannot be reduced by conservative and endoscopic methods. In the context of CP, there is a wide range of surgical procedures, including resection, drainage and hybrid procedures. Among the resection techniques, we distinguish pancreaticoduodenectomy (PD), pylorus-preserving pancreaticoduodenectomy (PPPD), Beger procedure - resection of the pancreatic head with preservation of the duodenum, total pancreatectomy with islet autotransplantation (TPIAT). Drainage procedures include the Puestow procedure - cutting and clearing the dilated pancreatic duct and connecting it along its length to a loop of the small intestine, Partington and Rochelle modification - involves the same longitudinal pancreaticojejunostomy, but without resection of the pancreatic tail, Izbicki procedure - a longitudinal V-shaped incision on the anterior surface of the pancreas, covering the second and third order ducts, followed by lateral pancreaticojejunostomy. Hybrid procedures include Frey procedure - a procedure combining partial resection of the pancreatic head with longitudinal pancreaticojejunostomy, Berne modification - resection of the pancreatic head with less mobilisation of the duodenum, the Hamburg modification – a combination of elements of the Frey and Beger procedures – a greater extent of resection within the head of the pancreas with a longitudinal duct incision and anastomosis. Surgeries in which the head of the pancreas is removed but the duodenum is not resected are collectively referred to as Duodenum-Preserving Pancreatic Head Resection (DPPHR). In order to select the appropriate method, the dilated or non-dilated pancreatic duct, the presence or absence of inflammatory changes in the pancreas, and the presence or absence of changes suspected to be malignant are assessed before surgery. The critical triangle for resection is limited by the common bile duct, the Wirsung duct and the portal vein. From

the latest studies comparing various surgical techniques used in the treatment of chronic pancreatitis, we can draw the following conclusions. Both PD and DPPHR provided effective pain control, but DPPHR showed better results in terms of pancreatic endocrine function. Other studies have demonstrated that DPPHR was superior to PPPD in terms of pain control, weight gain, preservation of pancreatic reserve, operating time, complications, length of hospital stay, and quality of life. Both methods were effective in alleviating pain. Further conclusions from scientific reports provide information that after 15 years, overall survival is better in the PPPD group, but physical condition is better in the Frey group. Both methods are effective in pain relief. A comparison of the Frey and Beger methods confirmed the long-term equivalence of both techniques. However, the Berne modification was more advantageous in terms of operation time and length of hospitalisation than the Beger method, but the quality of life was similar in both groups. In advanced CP, the long-term effectiveness of surgical procedures is greater than that of endoscopic procedures. (26, 27, 28, 29)

Results

The review of the literature highlights that chronic pancreatitis (CP) is a multifactorial disease with alcohol consumption and smoking as the leading modifiable risk factors, while genetic, autoimmune, and metabolic factors play an increasingly recognized role. Symptomatic management, including lifestyle modification, pain control, enzyme replacement therapy, and glycemic management, is effective in the majority of patients. Endoscopic interventions are beneficial for selected cases with ductal obstruction, but approximately 25% of patients eventually require surgical treatment. Duodenum-preserving pancreatic head resections and other hybrid procedures demonstrate favorable outcomes in terms of long-term pain relief, preservation of pancreatic function, and quality of life. Psychological support and nutritional optimization, including supplementation of fat-soluble vitamins, are consistently reported as important adjuncts in improving overall patient well-being. Across the studies, the integration of a multidisciplinary approach consistently correlates with better clinical outcomes.

Discussion

The findings underscore the complexity of CP and the necessity of individualized, multidisciplinary management. While conservative measures remain the cornerstone of therapy, invasive interventions, including endoscopic and surgical techniques, provide durable symptom relief in refractory cases. The evidence supports duodenum-preserving and hybrid surgical procedures as particularly effective in maintaining pancreatic function and quality of life. Additionally, addressing psychosocial and nutritional aspects is crucial for mitigating the chronic burden of pain, preventing malnutrition, and reducing the risk of secondary complications such as osteoporosis and diabetes. These results highlight that comprehensive patient care, rather than isolated interventions, is essential for optimal long-term outcomes and improving the overall prognosis of patients with CP.

Conclusions

Chronic pancreatitis is a disease that significantly reduces the quality of life of patients due to chronic pain and progressive pancreatic insufficiency. The disease has complex causes, including both environmental and genetic factors. A key element of treatment is a comprehensive approach that includes lifestyle changes, particularly cessation of alcohol consumption and smoking, which can slow the progression of the disease and reduce the risk of complications, including pancreatic cancer. Pharmacological treatment focuses on pain relief and replenishing pancreatic enzyme deficiencies, and in patients with metabolic disorders, on controlling diabetes. In cases where conservative methods fail, endoscopic or surgical interventions are used to improve prognosis and quality of life. Psychological support plays an important role in coping with chronic pain and the limitations resulting from the disease. Comprehensive patient care is essential to reduce symptoms and slow the progression of the disease.

Authors contributions:

Julia Czerwik, Katarzyna Krzemińska, Maria Kubas: Conceptualization, Writing - rough preparation, Methodology, Investigation, Project administration

Julia Kuszneruk, Joanna Dmochowska: Formal Analysis, Visualisation

Karol Kanon, Patrycja Felisiak: Software, Resources

Aleksandra Kaźmierczyk, Jędrzej Kęsik: Writing – review and editing

Marta Czubala: Supervision, Data curation

All authors have read and agreed with the published version of the manuscript.

Conflict of Interest Statement: All authors declare that they have no conflicts of interest.

REFERENCES

1. Han, C., Lv, Y. W., & Hu, L. H. (2024). Management of chronic pancreatitis: recent advances and future prospects. *Therapeutic advances in gastroenterology*, *17*, 17562848241234480. https://doi.org/10.1177/17562848241234480
2. Yadav, D., Palermo, T. M., Phillips, A. E., Bellin, M. D., & Conwell, D. L. (2021). Painful chronic pancreatitis - new approaches for evaluation and management. *Current opinion in gastroenterology*, *37*(5), 504–511. https://doi.org/10.1097/MOG.0000000000000769
3. Pham, A., & Forsmark, C. (2018). Chronic pancreatitis: review and update of etiology, risk factors, and management. *F1000Research*, *7*, F1000 Faculty Rev-607. https://doi.org/10.12688/f1000research.12852.1
4. Majumder, S., & Chari, S. T. (2016). Chronic pancreatitis. *Lancet (London, England)*, *387*(10031), 1957–1966. https://doi.org/10.1016/S0140-6736(16)00097-0
5. Hart, P. A., & Conwell, D. L. (2020). Chronic Pancreatitis: Managing a Difficult Disease. *The American journal of gastroenterology*, *115*(1), 49–55. https://doi.org/10.14309/ajg.0000000000000421
6. Cañamares-Orbís, P., García-Rayado, G., & Alfaro-Almajano, E. (2022). Nutritional Support in Pancreatic Diseases. *Nutrients*, *14*(21), 4570. https://doi.org/10.3390/nu14214570
7. Shimizu, K., Ito, T., Irisawa, A., Ohtsuka, T., Ohara, H., Kanno, A., Kida, M., Sakagami, J., Sata, N., Takeyama, Y., Tahara, J., Hirota, M., Fujimori, N., Masamune, A., Mochida, S., Enomoto, N., Shimosegawa, T., & Koike, K. (2022). Evidence-based clinical practice guidelines for chronic pancreatitis 2021. *Journal of gastroenterology*, *57*(10), 709–724. https://doi.org/10.1007/s00535-022-01911-6
8. Williams, A. C. C., Fisher, E., Hearn, L., & Eccleston, C. (2020). Psychological therapies for the management of chronic pain (excluding headache) in adults. *The Cochrane database of systematic reviews*, *8*(8), CD007407. https://doi.org/10.1002/14651858.CD007407.pub4
9. Anderson, M. A., Akshintala, V., Albers, K. M., Amann, S. T., Belfer, I., Brand, R., Chari, S., Cote, G., Davis, B. M., Frulloni, L., Gelrud, A., Guda, N., Humar, A., Liddle, R. A., Slivka, A., Gupta, R. S., Szigethy, E., Talluri, J., Wassef, W., Wilcox, C. M., … Whitcomb, D. C. (2016). Mechanism, assessment and management of pain in chronic pancreatitis: Recommendations of a multidisciplinary study group. *Pancreatology : official journal of the International Association of Pancreatology (IAP) ... [et al.]*, *16*(1), 83–94. https://doi.org/10.1016/j.pan.2015.10.015
10. Nag, D. S., Swain, B. P., Anand, R., Barman, T. K., & Vatsala (2024). Pain management in chronic pancreatitis. *World journal of clinical cases*, *12*(12), 2016–2022. https://doi.org/10.12998/wjcc.v12.i12.2016
11. Olesen, S. S., Bouwense, S. A., Wilder-Smith, O. H., van Goor, H., & Drewes, A. M. (2011). Pregabalin reduces pain in patients with chronic pancreatitis in a randomized, controlled trial. *Gastroenterology*, *141*(2), 536–543. https://doi.org/10.1053/j.gastro.2011.04.003
12. van Zeggeren, L., Boelens Nabbi, R., Kallewaard, J. W., Steegers, M., Cohen, S. P., Kapural, L., van Santvoort, H., & Wolff, A. (2025). 16. Pain in chronic pancreatitis. *Pain practice : the official journal of World Institute of Pain*, *25*(4), e70030. https://doi.org/10.1111/papr.70030
13. Drewes, A. M., Bouwense, S. A. W., Campbell, C. M., Ceyhan, G. O., Delhaye, M., Demir, I. E., Garg, P. K., van Goor, H., Halloran, C., Isaji, S., Neoptolemos, J. P., Olesen, S. S., Palermo, T., Pasricha, P. J., Sheel, A., Shimosegawa, T., Szigethy, E., Whitcomb, D. C., Yadav, D., & Working group for the International (IAP – APA – JPS – EPC) Consensus Guidelines for Chronic Pancreatitis (2017). Guidelines for the understanding and management of pain in chronic pancreatitis. *Pancreatology : official journal of the International Association of Pancreatology (IAP) ... [et al.]*, *17*(5), 720–731. https://doi.org/10.1016/j.pan.2017.07.006
14. Whitcomb, D. C., Buchner, A. M., & Forsmark, C. E. (2023). AGA Clinical Practice Update on the Epidemiology, Evaluation, and Management of Exocrine Pancreatic Insufficiency: Expert Review. *Gastroenterology*, *165*(5), 1292–1301. https://doi.org/10.1053/j.gastro.2023.07.007

15. Capurso, G., Traini, M., Piciucchi, M., Signoretti, M., & Arcidiacono, P. G. (2019). Exocrine pancreatic insufficiency: prevalence, diagnosis, and management. *Clinical and experimental gastroenterology*, *12*, 129–139. https://doi.org/10.2147/CEG.S168266
16. Phillips, M. E., Hopper, A. D., Leeds, J. S., Roberts, K. J., McGeeney, L., Duggan, S. N., & Kumar, R. (2021). Consensus for the management of pancreatic exocrine insufficiency: UK practical guidelines. *BMJ open gastroenterology*, *8*(1), e000643. https://doi.org/10.1136/bmjgast-2021-000643
17. de la Iglesia-García, D., Huang, W., Szatmary, P., Baston-Rey, I., Gonzalez-Lopez, J., Prada-Ramallal, G., Mukherjee, R., Nunes, Q. M., Domínguez-Muñoz, J. E., Sutton, R., & NIHR Pancreas Biomedical Research Unit Patient Advisory Group (2017). Efficacy of pancreatic enzyme replacement therapy in chronic pancreatitis: systematic review and meta-analysis. *Gut*, *66*(8), 1354–1355. https://doi.org/10.1136/gutjnl-2016-312529
18. Forsmark, C. E., Tang, G., Xu, H., Tuft, M., Hughes, S. J., & Yadav, D. (2020). The use of pancreatic enzyme replacement therapy in patients with a diagnosis of chronic pancreatitis and pancreatic cancer in the US is infrequent and inconsistent. *Alimentary pharmacology & therapeutics*, *51*(10), 958–967. https://doi.org/10.1111/apt.15698
19. Hart, P. A., Bellin, M. D., Andersen, D. K., Bradley, D., Cruz-Monserrate, Z., Forsmark, C. E., Goodarzi, M. O., Habtezion, A., Korc, M., Kudva, Y. C., Pandol, S. J., Yadav, D., Chari, S. T., & Consortium for the Study of Chronic Pancreatitis, Diabetes, and Pancreatic Cancer(CPDPC) (2016). Type 3c (pancreatogenic) diabetes mellitus secondary to chronic pancreatitis and pancreatic cancer. *The lancet. Gastroenterology & hepatology*, *1*(3), 226–237. https://doi.org/10.1016/S2468-1253(16)30106-6
20. Rickels, M. R., Bellin, M., Toledo, F. G., Robertson, R. P., Andersen, D. K., Chari, S. T., Brand, R., Frulloni, L., Anderson, M. A., Whitcomb, D. C., & PancreasFest Recommendation Conference Participants (2013). Detection, evaluation and treatment of diabetes mellitus in chronic pancreatitis: recommendations from PancreasFest 2012. *Pancreatology : official journal of the International Association of Pancreatology (IAP) ... [et al.]*, *13*(4), 336–342. https://doi.org/10.1016/j.pan.2013.05.002
21. Dumonceau, J. M., Delhaye, M., Tringali, A., Arvanitakis, M., Sanchez-Yague, A., Vaysse, T., Aithal, G. P., Anderloni, A., Bruno, M., Cantú, P., Devière, J., Domínguez-Muñoz, J. E., Lekkerkerker, S., Poley, J. W., Ramchandani, M., Reddy, N., & van Hooft, J. E. (2019). Endoscopic treatment of chronic pancreatitis: European Society of Gastrointestinal Endoscopy (ESGE) Guideline - Updated August 2018. *Endoscopy*, *51*(2), 179–193. https://doi.org/10.1055/a-0822-0832
22. Waldthaler, A., Valente, R., Arnelo, U., & Löhr, J. M. (2019). Endoscopic and Conservative Management of Chronic Pancreatitis and Its Complications. *Visceral medicine*, *35*(2), 98–108. https://doi.org/10.1159/000499611
23. Vila, J. J., & Bolado, F. (2021). Endoscopic management of local complications of chronic pancreatitis. *Revista espanola de enfermedades digestivas*, *113*(8), 602–609. https://doi.org/10.17235/reed.2020.7372/2020
24. Strand, D. S., Law, R. J., Yang, D., & Elmunzer, B. J. (2022). AGA Clinical Practice Update on the Endoscopic Approach to Recurrent Acute and Chronic Pancreatitis: Expert Review. *Gastroenterology*, *163*(4), 1107–1114. https://doi.org/10.1053/j.gastro.2022.07.079
25. Wilcox, C. M., Bang, J. Y., Buxbaum, J., Gardner, T. B., Hawes, R., Kedia, P., Mardini, S. H., Muniraj, T., Navaneethan, U., Oza, V. M., Tarnasky, P., Thakkar, S., Waxman, I., Varadarajulu, S., & US Pancreatic Disease Study Group (2024). Effect of endoscopic ultrasound guided celiac plexus block on the palliation of pain in chronic pancreatitis (EPOCH Trial): study protocol for a randomized multicenter sham-controlled trial {1}. *Trials*, *25*(1), 676. https://doi.org/10.1186/s13063-024-08478-y
26. Dankha, R., Sparrelid, E., Gilg, S., Löhr, J. M., & Ghorbani, P. (2025). Surgical management of chronic pancreatitis: A narrative review. *United European gastroenterology journal*, *13*(1), 44–54. https://doi.org/10.1002/ueg2.12694
27. Izbicki, J. R., Bloechle, C., Broering, D. C., Knoefel, W. T., Kuechler, T., & Broelsch, C. E. (1998). Extended drainage versus resection in surgery for chronic pancreatitis: a prospective randomized trial comparing the longitudinal pancreaticojejunostomy combined with local pancreatic head excision with the pylorus-preserving pancreatoduodenectomy. *Annals of surgery*, *228*(6), 771–779. https://doi.org/10.1097/00000658-199812000-00008
28. Klempa, I., Spatny, M., Menzel, J., Baca, I., Nustede, R., Stöckmann, F., & Arnold, W. (1995). Pankreasfunktion und Lebensqualität nach Pankreaskopfresektion bei der chronischen Pankreatitis. Eine prospektive, randomisierte Vergleichsstudie nach duodenumerhaltender Pankreaskopfresektion versus Whipple'scher Operation [Pancreatic function and quality of life after resection of the head of the pancreas in chronic pancreatitis. A prospective, randomized comparative study after duodenum preserving resection of the head of the pancreas versus Whipple's operation]. *Der Chirurg; Zeitschrift fur alle Gebiete der operativen Medizen*, *66*(4), 350–359.
29. Büchler, M. W., Friess, H., Müller, M. W., Wheatley, A. M., & Beger, H. G. (1995). Randomized trial of duodenum-preserving pancreatic head resection versus pylorus-preserving Whipple in chronic pancreatitis. *American journal of surgery*, *169*(1), 65–70. https://doi.org/10.1016/s0002-9610(99)80111-1