



№1
2025

Proceedings of the Shevchenko Scientific Society. Medical Sciences 2025, 1 (77). <https://doi.org/10.25040/ntsh>

www.msps.org.ua

DOI: 10.25040/ntsh2025.01.16

For correspondence: Lviv Medical University, Lviv, Ukraine
E-mail: pharm_law@ukr.net

Received: 21 Mar, 2025
Accepted: 12 May, 2025
Published: 20 Jun, 2025

ORCID IDs
Oleksandr Nevzhoda:
<https://orcid.org/0009-0001-2777-7333>
Alina Osyntseva:
<https://orcid.org/0000-0003-1655-318X>
Viktoriia Shapovalova:
<https://orcid.org/0000-0003-4770-7292>
Iurii Titarenko:
<https://orcid.org/0009-0002-8664-9013>
Valentyn Shapovalov:
<https://orcid.org/0000-0002-9329-0195>
Viktoria Dovzhuk:
<https://orcid.org/0000-0002-3491-018X>
Valerii Shapovalov:
<https://orcid.org/0000-0002-6696-6380>

Conflict of Interest: The authors declared no conflict of interest.

Authors Contributions:

Conceptualization: Viktoriia Shapovalova;
Manuscript preparation: Alina Osyntseva, Viktoria Dovzhuk, Valerii Shapovalov, Yurii Tytarenko.
Review and final approval of the manuscript: Oleksandr Nevzhoda, Valentyn Shapovalov.

Ethical approval: The study was approved by the Ethics Committee for Scientific Research, Experimental Developments, and Academic Studies of the PNU "Research University of Medical and Pharmaceutical Law"

Funding: The authors did not receive any financial support for their study.



© All authors, 2025

Original research: Clinical sciences

OPTIMIZATION OF PHARMACOTHERAPY FOR CHRONIC PANCREATITIS: USE OF ABC/VED ANALYSIS IN MARKETING AND PHARMACOECONOMIC STUDIES

Oleksandr Nevzhoda¹, Alina Osyntseva², Viktoriia Shapovalova², Iurii Titarenko³, Valentyn Shapovalov³, Viktoria Dovzhuk⁴, Valerii Shapovalov²

¹Danylo Halytsky Lviv National Medical University, Lviv, Ukraine

² Lviv Medical University, Lviv, Ukraine

³Private Scientific Institution "Scientific and Research University of Medical and Pharmaceutical Law", Kyiv, Ukraine

⁴Bogomolets National Medical University, Kyiv, Ukraine

Chronic pancreatitis (CP) is a progressive inflammatory disease that leads to irreversible damage to the pancreas, causing exocrine and endocrine insufficiency. The optimization of CP pharmacotherapy is a critical issue due to the increasing prevalence of the disease and the need for cost-effective and evidence-based treatment strategies. The use of ABC/VED analysis provides an opportunity to classify and prioritize medications based on their clinical significance and economic feasibility. **Objective.** The study aimed to optimize the pharmacotherapy of chronic pancreatitis by applying ABC/VED analysis in the context of marketing and pharmacoeconomic research. **Methods.** The research included a comprehensive review of regulatory documents, clinical guidelines, and pharmacoeconomic evaluations. A multidisciplinary expert survey was conducted involving 50 healthcare professionals, including gastroenterologists, surgeons, endocrinologists, general practitioners, and pharmacists. ABC analysis was applied to classify medications based on their cost contribution, while VED analysis categorized drugs into vital (V), essential (E), and desirable (D) groups. The study also assessed the regulatory framework for CP pharmacotherapy at national and international levels. **Results.** The study identified inconsistencies between national and international regulatory documents regarding CP pharmacotherapy. Among 30 analyzed medications, five drugs (Imipenem + Cilastatin, Meropenem, Metronidazole, Cefotaxime, Ciprofloxacin) were included in all four regulatory documents. ABC analysis showed that 82.21% of total expenditures were allocated to category A drugs, 15.54% to category B, and 2.25% to category C. VED analysis revealed that 43% of drugs were classified as vital, while 57% were essential, with no drugs considered non-essential. A combined ABC/VED matrix indicated that category A/V drugs had the highest expenditure share (41.54%), highlighting their priority in CP treatment. **Conclusions.** The application of ABC/VED analysis in CP pharmacotherapy enables a structured and economically justified approach to medication selection. The study revealed regulatory discrepancies that may impact drug accessibility and treatment effectiveness. The findings provide evidence-based recommendations for optimizing CP pharmacotherapy, ensuring alignment with both international standards and national healthcare policies. Future research should focus on integrating pharmacoeconomic assessments into clinical decision-making and updating national treatment protocols accordingly.

Keywords: chronic pancreatitis, pharmacotherapy, ABC analysis, VED analysis, drug regulation, pharmacoeconomics.

Introduction

Chronic pancreatitis (CP) is a progressive inflammatory disease of the pancreas, which leads to its irreversible morphological changes and dysfunction. The main clinical manifestations of CP are abdominal pain, exocrine and endocrine insufficiency, which significantly reduces the quality of life of patients [1; 2]. The incidence of CP in industrialized countries is from 5 to 12 cases per 100,000 adult populations, with a tendency to increase worldwide [3, 4; 5]. The main etiological factors of CP are COVID-19, post-COVID-19, long-COVID-19, comorbid addictive disorders, cholelithiasis, as well as genetic and autoimmune factors [6; 7].

Despite the availability of generally accepted international clinical recommendations, the issue of optimizing pharmacotherapy for CP remains open, especially in the context of pharmacoeconomic evaluation of used drugs (medicines) [8; 9]. In modern medical practice, considerable attention is paid to the analysis of the effectiveness of pharmacotherapy using marketing and economic methods, such as ABC/VED analysis, which allows to systematize drugs by cost and clinical significance [10; 11].

The novelty of this study lies in the integrated approach to pharmacotherapy for CP, which includes an analysis of the regulatory framework, marketing assessment of drugs, as well as their pharmacoeconomic effectiveness within medical institutions. Conducting such an analysis allows to establish priority drugs for the treatment of CP, assess their compliance with international standards and develop recommendations for optimizing their use [9].

The aim of the study is to optimize pharmacotherapy for chronic pancreatitis by applying ABC/VED analysis in the marketing aspect and pharmacoeconomic studies.

Methods.

The study was conducted in several stages. At the first stage, an analysis of the regulatory framework for pharmacotherapy of chronic pancreatitis (CP) was carried out, including international and national clinical protocols, the State Formulary of Medicines, the National List of Essential Medicines, as well as licensing conditions for medical and pharmaceutical activities.

At the second stage, marketing research was conducted using the questionnaire method. 50 specialists participated in the study: gastroenterologists, surgeons, endocrinologists, family doctors and pharmacists. The drugs (drugs) used in clinical practice for treating CP were evaluated, their compliance with international and national standards, clinical protocols, and their availability in regulatory documents.

At the third stage, a pharmacoeconomic analysis was carried out using ABC/VED methods. ABC analysis allowed us to determine the distribution of drug costs, dividing them into three categories:

- A – the most expensive drugs (over 70% of total costs),
- B – medium-cost (15-20%),
- C – the least expensive (up to 10%).

VED analysis was performed to distribute drugs according to their clinical significance:

- V (vital) – vital,
- E (essential) – necessary,
- D (desirable) – secondary.

The data obtained were processed using descriptive statistics methods, with the calculation of mean values, frequency distribution, and percentages.

The study of the article is a fragment of research works of Private Scientific Institution "Scientific and Research University of Medical and Pharmaceutical Law" and Danylo Halytsky Lviv National Medical University on the topic "Diagnosis, treatment, pharmacotherapy of inflammatory, traumatic and onco-thoracic pathology using instrumental methods" (state registration number 0125U000071, implementation period 2025-2031) and "Multidisciplinary research of post-traumatic stress disorders during war among patients (primarily combatants)" (state registration number 0124U002540, implementation period 2024-2029); Lviv Medical Institute on the topic of

"Improving the system of circulation of drugs during pharmacotherapy based on evidentiary and forensic pharmacy, organization, technology, biopharmacy and pharmaceutical law" (state registration number 0120U105348, implementation period 2021-2026).

Results.

Alcohol is the cause of 70–90% of cases of chronic inflammation of the pancreas, but the exact mechanism is unknown. It most often affects men aged 40–50 years. With alcohol abuse, the risk of developing chronic inflammation of the pancreas increases with the amount and duration of alcohol consumption. CP develops in only 5–10% of people who abuse alcohol, probably due to the importance of concomitant factors, such as genetic changes, a diet high in fat and protein or low in antioxidants, and smoking. Pain in alcoholic chronic inflammation of the pancreas is probably relieved by abstinence; the disease may progress in severity despite cessation of alcohol consumption. Concomitant cirrhosis of the liver is relatively rare in patients with chronic pancreatitis [12-16].

CP in ICD-10 has codes K 86.0, K 86.1, in ICD-11 code DC32 [17; 18].

According to the unified clinical protocol of primary and specialized medical care "Chronic pancreatitis" (order of the Ministry of Health of Ukraine dated 04.07.2023 No. 1204), drugs of the following clinical and pharmacological groups are used in the pharmacotherapy of chronic pancreatitis: analgesics and antipyretics; proton pump inhibitors; nonsteroidal anti-inflammatory and antirheumatic drugs; antispasmodics; enzyme preparations; blood substitutes and perfusion solutions; non-narcotic analgesics; narcotic analgesics in short courses; antispasmodics; proton pump inhibitors; vitamins; antibiotics, etc. [19].

The regulatory and legal characteristics of drugs for the pharmacotherapy of chronic pancreatitis by international non-proprietary names (INN), considering the provisions of modern international and domestic legislation, are presented in Table 1.

Table 1– Regulatory and legal characteristics of drugs for the pharmacotherapy of chronic pancreatitis

No.	INN	International guidelines [20]	National protocol [19]	National list [21]	State formular [22]
1.	Glucose	-	+	+	+
2.	Drotaverine	-	+	+	+
3.	Esomeprazole	-	+	-	+
4.	Ergocalciferol	+	+	-	+
5.	Ibuprofen	-	+	+	+
6.	Imipenem + Cilastatin	+	+	+	+
7.	Lansoprazole	-	+	-	+
8.	Mebeverine	-	+	-	+
9.	Menadione	+	+	-	+
10.	Meropenem	+	+	+	+
11.	Metamizole sodium	-	+	+	+
12.	Metronidazole	+	+	+	+
13.	Octreotide	-	+	-	+

14.	Omeprazole	-	+	+	+
15.	Pancreatin	+	+	-	+
16.	Pantoprazole	-	+	-	+
17.	Papaverine	-	+	-	+
18.	Paracetamol	-	+	+	+
19.	Rabeprazole	-	+	-	+
20.	Retinol	+	+	-	+
21.	Albumin	-	+	-	+
22.	Sorbitol + Sodium lactate + Sodium chloride + Calcium chloride + Potassium chloride + Magnesium chloride	-	+	-	+
23.	Tocopherol	+	+	-	+
24.	Tramadol	-	+	-	+
25.	Phytomenadione	+	+	+	+
26.	Cefoperazone	+	+	-	+
27.	Cefotaxime	+	+	+	+
28.	Ceftriaxone	+	+	-	+
29.	Cefuroxime	+	+	-	+
30.	Ciprofloxacin	+	+	+	+

Among the drugs listed in Table 1, only five (Imipenem + Cilastatin, Meropenem, Metronidazole, Cefotaxime, Ciprofloxacin) were included in all 4 regulatory documents, which indicates their recognition and use both at the international and national levels. Also, in international and domestic practice, 8 drugs are used in the pharmacotherapy of chronic pancreatitis (Ergocalciferol, Cefuroxime, Cefoperazone, Ceftriaxone, Menadione, Pancreatin, Retinol, Tocopherol), which were included in 3 regulatory documents (in addition to the National List of Essential Drugs).

Separately, it should be noted the inconsistency of regulatory documents regarding the following 16 drugs (Human albumin solution, Glucose, Drotaverine, Esomeprazole, Ibuprofen, Lansoprazole, Mebeverine, Metamizole sodium, Octreotide, Omeprazole, Pantoprazole, Papaverine, Paracetamol, Rabeprazole, Sorbitol + Sodium lactate + Sodium chloride + Calcium chloride + Potassium chloride + Magnesium chloride, Tramadol), which are used in national medical practice in the pharmacotherapy of CP (Order of the Ministry of Health of Ukraine dated July 04, 2023 No. 1204) [19] and are not used in international practice – they are absent in guideline 00209 [20]. It should be noted that all drugs included in the chronic pancreatitis treatment protocol (Order of the Ministry of Health of Ukraine dated July 04, 2023 No. 1204) [19] are in the State Formulary of the fifteenth edition (Order of the Ministry of Health of Ukraine dated June 16, 2023 No. 1102) [22].

The above indicates certain contradictions and inconsistencies of domestic regulatory and legal documents with international ones regarding the pharmacotherapy of chronic pancreatitis.

The next stage of the study was a survey of a multidisciplinary committee of doctors and pharmacists to determine the awareness of specialists about drugs recommended for pharmacotherapy of chronic pancreatitis following

international and national regulatory documents, as well as to assess their availability and legal regime of circulation in Ukraine. Participants were provided with a list of drugs by international non-proprietary names, selected based on the analysis of clinical recommendations and protocols. Respondents were required to mark drugs that, in their opinion, simultaneously comply with international and national recommendations, are actively used in clinical practice, and are registered for use in Ukraine.

Doctors and pharmacists were offered a questionnaire that included all drugs for the pharmacotherapy of CP by INN, considering the provisions of modern international and domestic legislation. As a result of the analysis of the responses, 14 drugs were selected that were recognized as most fully meeting the criteria of clinical significance, regulatory compliance, and availability on the pharmaceutical market. These drugs were included in the further analysis of their availability. The WHO definition of two dimensions of availability was considered: availability (physical availability) and price (economic availability). The authors of the article expanded the substantive dimension of drug availability for patients in the format of its assessment according to three characteristics: clinical and pharmacological group, classification and legal group, and nomenclature and legal group (Table 2).

Table 2 – Characteristic indicators of registered drugs for the pharmacotherapy of chronic pancreatitis

No.	INN	Clinical and pharmacological group [25]	Classification and legal group [26]	Nomenclature and legal group [27]
1.	Ergocalciferol	Vitamin D preparations and analogues (A11C C01)	general	prescription (f-1)
2.	Imipenem + Cilastatin	Antibacterials for systemic use, Carbapenems. Imipenem and enzyme inhibitor (J01D H51)	general	prescription (f-1)
3.	Menadione	Vitamin K and other haemostatics (B02B A02)	general	prescription (f-1)
4.	Meropenem	Antimicrobials for systemic use. β -lactam antibiotics. Carbapenems (J01D H02)	general	prescription (f-1)
5.	Metronidazole	Antibacterials for systemic use. Imidazole derivatives (J01X D01)	general	prescription (f-1)
6.	Pancreatin	Digestive agents, including enzymes. Polyzyme preparations (A09A A02)	general	over-the-counter
7.	Retinol	Simple vitamin A preparation. Retinol (vitamin A) (A11C A01)	general	over-the-counter
8.	Tocopherol	Simple vitamin preparations. Tocopherol (vitamin E) (A11H A03)	general	over-the-counter
9.	Phytomenadione	K and other haemostatics, phytomenadione (B02B A01)	general	prescription (f-1)
10.	Cefoperazone	Antibacterials for systemic use. Beta-lactam antibiotics. Third-generation	general	prescription (f-1)

No.	INN	Clinical and pharmacological group [25]	Classification and legal group [26]	Nomenclature and legal group [27]
		cephalosporins (J01D D62)		
11.	Cefotaxime	Antimicrobials for systemic use. Other β -lactam antibiotics. Third-generation cephalosporins. Cefotaxime (J01D D01)	general	prescription (f-1)
12.	Ceftriaxone	Antibacterials for systemic use. Other β -lactam antibiotics. Third-generation cephalosporins. Ceftriaxone (J01D D04)	general	prescription (f-1)
13.	Cefuroxime	Antibacterials for systemic use. Second-generation cephalosporins (J01D C02)	general	prescription (f-1)
14.	Ciprofloxacin	Antibacterials for systemic use. Fluoroquinolone group. Ciprofloxacin (J01M A02)	general	prescription (f-1)

The characteristics of accessibility for patients of drugs registered in Ukraine, prescribed for the pharmacotherapy of chronic pancreatitis, according to the respondents, are important for their justified use in medical practice. In particular, these are: 1) clinical and pharmacological group according to the ATC classification (Anatomical Therapeutic Chemical Classification System); 2) classification and legal group, by which the authors mean the distribution of drugs by scope of use (general purpose, special or limited use - narcotic, psychotropic, precursors, sedatives, poisonous) according to regulatory legal acts on drug supply; 3) nomenclature and legal group, i.e. the form of release of the drug – by prescription (prescription) or without a prescription (over-the-counter). These characteristics are not a direct indicator of accessibility according to the WHO definition (which includes availability and affordability), but they make it possible to assess the legal status and potential availability of drugs within the framework of national regulation. Therefore, in the following text, instead of the term “availability”, the concept of “characteristics of medicines chosen by respondents” is used to avoid terminological confusion.

From Table 2, according to the clinical and pharmacological characteristics, drugs are divided into 4 groups by the ATC code: A09 “Replacement therapy agents used in digestive disorders, including enzymes”; A11 “Vitamins”; B02 “Antihemorrhagic agents”; J01 “Antibacterial agents for medical use”. According to the classification and legal characteristics, all drugs belong to the general group. According to the nomenclature and legal characteristics, most drugs (78.57%) belong to the prescription group of drugs, that is, they are dispensed from pharmacies and their structural divisions according to a prescription form No. 1 (f-1), which is valid for 1 month from the date of discharge, except for Pancreatin, Retinol, Tocopherol, which can be purchased at a pharmacy without a doctor's prescription.

According to the current legislation of Ukraine, the circulation of medicinal products used for pharmacotherapy of chronic pancreatitis is carried out within the framework of general requirements for business entities in the field of healthcare. Medical institutions that provide primary, outpatient or inpatient care are required to have a license to conduct economic activities in medical practice, in accordance with the Resolution of the Cabinet of Ministers of Ukraine dated March 02, 2016, No. 285 [23]. Pharmacies, in turn, carry out production, import, wholesale and retail trade in medicinal products based on a license provided for by the Resolution of the Cabinet of Ministers of Ukraine dated November 30, 2016 No. 929 [24]. Thus, there are no special or specialized licensing conditions specifically for

the pharmacotherapy of chronic pancreatitis – the circulation of the relevant medicinal products is regulated by general requirements for all types of medical and pharmaceutical activities.

The introduction of information on the availability of drugs for pharmacotherapy of chronic pancreatitis into the activities of primary health care centers and other health care institutions will ensure proper organization of the drug circulation procedure at the stages of prescribing, prescribing, storage, accounting, quality control, transportation and dispensing in accordance with the requirements of current legislation.

It was then of interest to conduct a marketing analysis of drugs for pharmacotherapy of chronic pancreatitis (Table 3).

Table 3. Marketing – analysis of drugs for pharmacotherapy of chronic pancreatitis

No.	INN	Trade name / Manufacturer	Dosage form, amount per unit	Registration Certificate, Validity Period
1.	Ergocalciferol	Ergocalciferol/ JSC "Vitamins", Ukraine	1 ml of solution contains ergocalciferol 1.25 mg	UA/5393/01/01 unlimited from 22.12.2016
2.	Imipenem + Cilastatin	Synerpen / Sun Pharmaceutical Industries Limited, India	1 vial of powder for solution for infusion contains imipenem 530.10 mg; cilastatin sodium salt 530.70 mg	UA/9191/01/01 unlimited from 04.02.2020
3.	Menadione	Vikasol-Darnitsa / PrJSC "Pharmaceutical Firm "Darnitsa", Ukraine	1 ml of solution for injection contains vikasol (menadione sodium bisulfite) 10 mg	UA/6004/01/01 unlimited from 06.04.2017
4.	Meropenem	Meropenem / Private Joint Stock Company "Lekhim- Kharkiv", Ukraine	1 vial of powder for solution for injection contains meropenem 500 mg	UA/11213/01/02 unlimited from 23.04.2020
5.	Metronidazole	Metronidazole/ Subsidiary "Pharmatrade", Ukraine	100 ml of solution for infusion contains metronidazole 0.5 g	UA/4555/01/01 unlimited from 30.12.2016
6.	Pancreatin	Pancreatin / JSC "Vitamins", Ukraine	1 tablet contains pancreatin 250 mg	UA/0337/01/03 unlimited from 01.10.2018
7.	Retinol	Retinol acetate (Vitamin A) / PrJSC "Technolog", Ukraine	1 ml of solution contains retinol acetate 34.4 mg	UA/6646/01/01 unlimited from 25.07.2017
8.	Tocopherol	Vitamin E 400- Sanofi / JSC "Saneka	1 capsule contains 400 mg of tocopherol acetate	UA/3392/01/02 unlimited from 21.03.2019

No.	INN	Trade name / Manufacturer	Dosage form, amount per unit	Registration Certificate, Validity Period
		Pharmaceuticals", Slovak Republic		
9.	Phytomenadione	Kanavit/ HBM Pharma s.r.o., Slovak Republic	1 ml of solution for injection contains phytomenadione 10 mg	UA/12630/01/01 unlimited from 08.11.2017
10.	Cefoperazone	Macrocef / NSPS Hebei Huamin Pharmaceutical Company Limited, China	1 vial of powder for solution for injection contains: cefoperazone sodium 500 mg, sulbactam sodium 500 mg	UA/8972/01/01 unlimited from 20.07.2020
11.	Cefotaxime	Cefotaxime- BHFZ/ Public Joint Stock Company "Research and Production Center "Borshchagov Chemical and Pharmaceutical Plant", Ukraine	1 vial of powder for solution for injection contains cefotaxime 500 mg	UA/4252/01/01 unlimited from 17.09.2020
12.	Ceftriaxone	Ceftriaxone / Private Joint Stock Company "Lekhim- Kharkiv", Ukraine	1 vial of powder for solution for injection contains ceftriaxone 1.0 g	UA/13240/01/01 unlimited from 04.10.2018
13.	Cefuroxime	Cefuroxime- BHFZ / Public Joint Stock Company "Research and Production Center "Borshchagov Chemical and Pharmaceutical Plant", Ukraine	1 vial of powder for solution for injection contains 750 mg cefuroxime	UA/0565/01/02 unlimited from 01.08.2018
14.	Ciprofloxacin	Cyprinol / KRKA, Slovenia	1 tablet contains 250 mg ciprofloxacin	UA/0678/02/02 unlimited from 21.04.2021

According to the results of the multidisciplinary commission survey, among the medicines used for pharmacotherapy of chronic pancreatitis, the distribution by release form was as follows: tablets and capsules –

21.42% of prescriptions; oral solutions – 14.28%; solutions for injections or infusions – 28.57%; powders for injections/infusions – 35.71%. Thus, parenteral medicines prevail, which indicates the severity of the disease and the need for intensive therapy.

100% of the studied drugs have an unlimited period of validity of registration certificates.

Ranking of manufacturers of the studied drugs: India, China, Slovenia – 7.14% each, Slovak Republic – 14.28%, Ukraine – 64.29%.

The next stage of the research was the conduct of pharmacoeconomic studies by means of ABC/VED - analysis, which involves the distribution of drugs by the costs of pharmacotherapy and assessment of the effectiveness of drug use in the conditions of a healthcare institution (Tables 4, 5).

Table 4. ABC- analysis of drugs for pharmacotherapy of CP support

No.	INN	Costs, UAH	Specific weight (%)	ABC category
1.	Cefoperazone	1081,05	40,67	A
2.	Phytomenadione	573,50	21,58	A
3.	Meropenem	297,89	11,21	A
4.	Imipenem + Cilastatin	232,91	8,76	A
	Total by category A	2185,35	82,21	
5.	Ciprofloxacin	131,94	4,96	B
6.	Tocopherol	107,66	4,05	B
7.	Menadione	74,65	2,82	B
8.	Pancreatin	46,74	1,76	B
9.	Cefuroxime	26,70	1,00	B
10.	Ceftriaxone	25,31	0,95	B
	Total by category B	413	15,54	
	Total by categories AB:	2598,35	97,75	
11.	Ergocalciferol	17,11	0,64	C
12.	Retinol	16,09	0,61	C
13.	Metronidazole	14,31	0,54	C
14.	Cefotaxime	12,30	0,46	C
	Total by category C:	59,81	2,25	
	Total by categories ABC:	2658,16	100,00	

The prices indicated in Table 4 correspond to the retail price of a package of medicines of a specific manufacturer, which were available in official sources - registration certificates and electronic catalogs of medicines registered in Ukraine (for example, the State Register of Medicines of Ukraine, PharmUnion, Tabletki.ua, liki24.com). One trade name of each INN was selected for analysis, which is presented in Table 3, since these drugs were identified by respondents as the most frequently used in clinical practice. The choice of a specific manufacturer is because this

drug had an unlimited period of validity of the registration certificate and was available on the Ukrainian pharmaceutical market at the time of the study. However, the authors of the article recognize that the use of a single trade name limits the representativeness of the pharmacoeconomic assessment. In further studies, it is advisable to expand the sample by using weighted average retail or wholesale prices. Prices are as of February 15, 2025. On this date, the US dollar exchange rate according to the NBU was 38.25 UAH/1 USD.

As the results of the ABC analysis showed, category A included drugs whose use was 82.21% of the total use; category B – 15.54%, and category C – 2.25%.

Category A included 4 INNs of drugs (Cefoperazone, Phytomenadione, Meropenem, Imipenem + Cilastatin), the cost of which is 2185.35 UAH, which is 82.21% of the total cost of patient treatment.

Category B included 6 INNs of drugs (Ciprofloxacin, Tocopherol, Menadione, Pancreatin, Cefuroxime, Ceftriaxone), the total cost of which is 413 UAH (15.54%).

Category C included 4 INNs of drugs (Ergocalciferol, Retinol, Metronidazole, Cefotaxime) with a cost of 59.81 UAH (2.25%).

For further research and VED analysis, an additional questionnaire was conducted by a multidisciplinary commission to classify drugs for pharmacotherapy of CP support into categories: V – vital; E – essential; D – desirable, secondary. Doctors of various specialties who provide pharmacotherapy of CP support participated in the questionnaire. Doctors classified drugs into categories as follows:

Table 5. VED analysis of drugs for pharmacotherapy of CP support

No.	Trade name	VED category
1.	Imipenem + Cilastatin	V
2.	Meropenem	V
3.	Metronidazole	V
4.	Phytomenadione	V
5.	Cefotaxime	V
6.	Ciprofloxacin	V
7.	Ergocalciferol	E
8.	Menadione	E
9.	Pancreatin	E
10.	Retinol	E
11.	Tocopherol	E
12.	Cefoperazone	E
13.	Ceftriaxone	E
14.	Cefuroxime	E

Discussion.

According to the results of the VED analysis, found that six INNs of drugs (Imipenem + Cilastatin, Meropenem, Metronidazole, Phytomenadione, Cefotaxime, Ciprofloxacin) belong to category V. Eight INNs of drugs belong to category E (Ergocalciferol, Menadione, Pancreatin, Retinol, Tocopherol, Cefoperazone, Ceftriaxone, Cefuroxime).

No drugs were included in category D (desirable, secondary).

The distribution according to the results of the VED analysis of the studied INNs of drugs for pharmacotherapy of CP support is shown in Fig. 1.

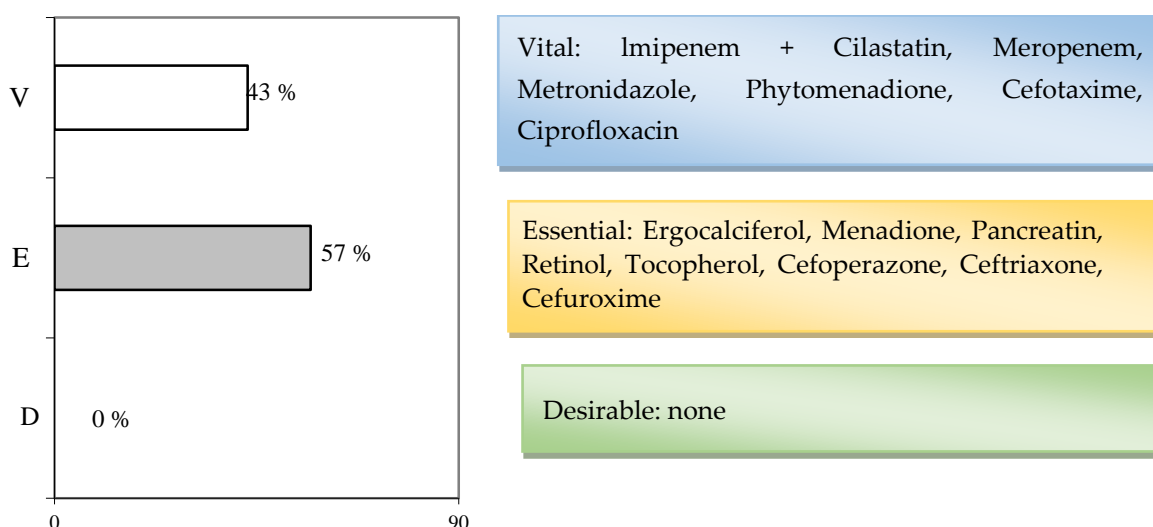


Figure 1. Distribution according to the results of VED analysis of the studied drugs for pharmacotherapy of CP support

The studied drugs are included in pharmacotherapy in 43% (Imipenem + Cilastatin, Meropenem, Metronidazole, Phytomenadione, Cefotaxime, Ciprofloxacin) as vital (category V), in 57% (Ergocalciferol, Menadione, Pancreatin, Retinol, Tocopherol, Cefoperazone, Ceftriaxone, Cefuroxime) as essential (category E).

Based on the conducted ABC/VED analysis, a matrix of the combined ABC/VED analysis was developed (Figure 2).

Category	Quantity	V		Quantity	E		Quantity	D	
		Purpose			Purpose			Purpose	
		UAH	%		UAH	%		UAH	%
A	3	1104,3	41,54	1	1081,05	40,67	-	-	-
B	1	131,94	4,96	5	281,06	10,58	-	-	-
C	2	26,61	1	2	33,2	1,25	-	-	-
Total:	6	1262,85	47,5	8	1395,10	52,5	-	-	-

Figure 2. Matrix of the combined ABC-VED analysis of drugs for the pharmacotherapy of CP support

The conducted studies show that:

INN drugs in category E accounted for the most expenses 52.5%, in category V – 47.5%, in category D – no expenses.

The share of expenses that fell on drugs: by categories: A/V (41.54%) – the largest indicator of the total indicator of drug prescription; for A/E – 40.67% and A/D – 0%. By category B/V – 4.96%; by category B/E – 10.58% and B/D – 0%.

Drugs in category C had the corresponding indicators: C/V – 1%; C/E – 1.25%; C/D – 0%.

The results of the ABC/VED analysis indicate the dominance of a certain group of drugs (in particular, category A/V), which confirms their significant place in practical use in the pharmacotherapy of chronic pancreatitis. Similar results are also presented in the study by Beyer et al. [3], where the emphasis is on the need to prioritize drugs based on clinical significance and cost.

The ratio between categories A, B, C in our analysis is typical for secondary-level medical institutions – most of the costs are concentrated on a small number of drugs. This corresponds to the general patterns described in the world pharmacoeconomic literature.

At the same time, the study has certain limitations: cost calculations were conditional, based only on the prices of one trade name for each INN, which does not allow extrapolating the results to the national level. In addition, the assessment of the clinical significance of drugs was carried out based on an expert survey, which implies subjectivity.

The results demonstrate the importance of integrating ABC/VED analysis into the drug management processes in healthcare institutions, for the development of local formularies, internal prescribing protocols, and the development of procurement strategies. Similar approaches are already being used in many countries, including Germany, the UK, and India [28-30].

Further research should focus on a full pharmacoeconomic analysis (cost-effectiveness, cost-benefit), assessment of clinical outcomes when using drugs from different categories, as well as on regional analysis of drug availability.

In conclusions:

1. Optimization of CP pharmacotherapy is possible through the comprehensive use of ABC/VED analysis, which allows rational distribution of costs and determines priority drugs.
2. A discrepancy was found between international and national regulatory approaches to the use of drugs in the treatment of CP, which requires further improvement of the regulatory framework.
3. The largest share of the total conditional cost in the analysis was occupied by drugs of category A/V (41.54%), which indicates their frequent presence among those drugs that respondents noted as clinically priority. The indicated costs are conditional and calculated based on the retail price of the package of each drug of a specific manufacturer, presented on the Ukrainian pharmaceutical market as of February 15, 2025. Thus, the results obtained are not calculations of the actual cost of treatment or course therapy, but demonstrate the ratio of the cost of individual drugs in the context of the ABC/VED analysis. In further studies, it is advisable to expand the analysis by considering the weighted average market prices and the number of doses per course of treatment.
4. The results obtained can be used to update clinical protocols, improve national recommendations, and develop strategies for financing drugs for patients with CP.

Therefore, the study showed the effectiveness of using ABC/VED analysis to improve pharmacotherapy of chronic pancreatitis. It was found that most costs fell on drugs of the A/V category (41.54%), which confirms their critical importance in treatment. The identified discrepancies between international and national regulatory documents on the pharmacotherapy of CP indicate the need to harmonize clinical recommendations to ensure consistency of approaches to the treatment of chronic pancreatitis at the national and international levels, as well as to review the regulatory framework governing the circulation of medicines to increase their availability to patients.

The results obtained are consistent with the data of modern studies, confirming the importance of pharmacoeconomic analysis for improving the effectiveness of treatment and rational use of resources. The use of ABC/VED analysis is a promising tool for determining priority drugs, which can be used in updating national protocols. Further studies should be aimed at assessing the long-term clinical and economic consequences of the proposed approaches, as well as at analyzing the availability of drugs in different regions.

Among the possible limitations of the study, it should be noted the use of a limited list of drugs, which may affect the general conclusions. In addition, the assessment of drug effectiveness was carried out based on an expert survey, which may contain a subjective component. Given these factors, further studies are needed to confirm the results obtained in the broader context of clinical practice.

Thus, the conducted ABC/VED analysis allowed us to systematize the drugs used for pharmacotherapy of chronic pancreatitis according to the criteria of cost and clinical significance, which can be used as an auxiliary tool in making managerial and pharmaceutical decisions within medical institutions.

References

1. Maev IV, Bideeva TV, Kucheryavyy YA, Andreev DN, Bueverov AO. Pharmacotherapy of chronic pancreatitis in terms of current clinical recommendations. *Ter Arkh.* 2018;90(8):81–85. <https://doi.org/10.26442/terarkh201890881-85>
2. Freeman AJ, Maqbool A, Bellin MD, Goldschneider KR, et al. Medical management of chronic pancreatitis in children: A position paper by the NASPGHAN Pancreas Committee. *J Pediatr Gastroenterol Nutr.* 2021;72(4):551–570. <https://doi.org/10.1097/MPG.0000000000003001>
3. Beyer G, Hoffmeister A, Lorenz P, Lynen P, Lerch MM, Mayerle J. Clinical practice guideline—Acute and chronic pancreatitis. *Dtsch Arztebl Int.* 2022;119(30–31):523–531. <https://doi.org/10.3238/arztebl.m2022.0223>
4. Iglesia-García D, Huang W, Szatmary P, Baston-Rey I, et al. Efficacy of pancreatic enzyme replacement therapy in chronic pancreatitis: Systematic review and meta-analysis. *Gut.* 2017;66(8):1354–1365. <https://doi.org/10.1136/gutjnl-2016-312529>
5. Cohen RZ, Freeman AJ. Pancreatitis in children. *Pediatr Clin North Am.* 2021;68(5):1007–1020. <https://doi.org/10.1016/j.pcl.2021.07.012>
6. Cohen SM, Kent TS. Etiology, diagnosis, and modern management of chronic pancreatitis: A systematic review. *JAMA Surg.* 2023;158(4):357–368. <https://doi.org/10.1001/jamasurg.2023.0367>
7. Shapovalova V. Forensic and pharmaceutical risks in the organization of pharmacotherapy of COVID, post-COVID and long-COVID disorders. *SSP Mod Pharm Med.* 2022;2(4):1–24. <https://doi.org/10.53933/ssppmpm.v2i4.69>
8. Shapovalov (Jr.) V, Gudzenko A, Komar L, Butko A, Shapovalova V, Shapovalov V. Concerning the importance of forensic and pharmaceutical researches to improve patients' accessibility to medicines. *Pharmacia.* 2017;64(2):23–29. [Internet]. Available from: Фармация, Том 64, Книжка 2, 2017 – Българско Научно Дружество по Фармация
9. Conwell DL, Lee LS, Yadav DS, et al. American pancreatic association practice guidelines in chronic pancreatitis: Evidence-based report on diagnostic guidelines. *Pancreas.* 2014;43(8):1143–1162. doi: <https://doi.org/10.1097/MPA.0000000000000237>
10. Nevzhoda O, Shapovalov V, Osyntseva A, et al. Codeines medicine: ABC/VED analysis, effectiveness and rationality of application. *Ann Mechnikov Inst.* 2024;4:29–34. <https://doi.org/10.5281/zenodo.14275098>
11. Haiduchok I. Supportive pharmacotherapy for systemic autoimmune diseases with hyperimmunocomplex syndrome (experimental research). *Georgian Med News.* 2021;9(318):159–165. PMID:34628400
12. DiMagno MJ, DiMagno EP. Chronic pancreatitis. *Curr Opin Gastroenterol.* 2013;29(5):531–536. doi:10.1097/MOG.0b013e3283639370
13. Patel V, Willingham F. The management of chronic pancreatitis. *Med Clin North Am.* 2018;102(5):895–910. <https://doi.org/10.1016/j.mcna.2018.08.012>
14. Xiang H, Yu H, Zhou Q, Wu Y, Ren J, Zhao Z, et al. Macrophages: A rising star in immunotherapy for chronic pancreatitis. *Pharmacol Res.* 2022;183:106508. <https://doi.org/10.1016/j.phrs.2022.106508>
15. DiMagno MJ, DiMagno EP. Chronic pancreatitis. *Curr Opin Gastroenterol.* 2012;28(5):523–528. <https://doi.org/10.1097/MOG.0b013e3283567dea>
16. Mergener K, Baillie J. Chronic pancreatitis. *Lancet.* 1997;350(9091):1379–1385.
17. Nevzhoda O. Modern Classification of Respiratory Diseases: Innovations in the International Classification of Diseases of the 11th Revision. *SSP Mod Pharm Med.* 2024;4(4):1–10. doi: <https://doi.org/10.53933/ssppmpm.v4i4.162>
18. World Health Organization. ICD-11: International Classification of Diseases 11th Revision [Internet]. Available from: <https://icd.who.int/browse/2025-01/mms/en#1758007371>

19. Ministry of Health of Ukraine. Order No. 1204 dated July 4, 2023: On approval of the Unified Clinical Protocol of Primary and Specialized Medical Care “Chronic Pancreatitis” [Internet]. Available from: https://www.dec.gov.ua/wp-content/uploads/2023/07/nakaz_1204_05072023.pdf
20. AWMF. S3-Leitlinie Pankreatitis. Registernummer 021-003, Version 3.1, 10.09.2021. Valid until: 30.04.2026 [Internet]. Available from: <https://register.awmf.org/de/leitlinien/detail/021-003>
21. Cabinet of Ministers of Ukraine. Resolution No. 333 dated March 25, 2009: On state regulation of prices for medicines and medical products [Internet]. Available from: <https://zakon.rada.gov.ua/laws/show/333-2009-rr>
22. Ministry of Health of Ukraine. Order No. 418 dated March 12, 2024: On approval of the 16th edition of the State Formulary of Medicines and ensuring its availability [Internet]. Available from: <https://moz.gov.ua/uk/decrees/nakaz-moz-ukraini-vid-12032024--418-pro-zatverdzhennja-shistnadcjatogo-vipusku-derzhavnogo-formuljara-likarskih-zasobiv-ta-zabezpechennja-jogo-dostupnosti>
23. Cabinet of Ministers of Ukraine. Resolution No. 285 dated March 2, 2016: On licensing conditions for medical practice [Internet]. Available from: <https://zakon.rada.gov.ua/laws/show/285-2016-rr>
24. Cabinet of Ministers of Ukraine. Resolution No. 929 dated November 30, 2016: On licensing conditions for manufacturing and trade in medicines [Internet]. Available from: <https://ips.ligazakon.net/document/KP160929>
25. WHO Collaborating Centre for Drug Statistics Methodology. ATC/DDD Index 2024 [Internet]. Available from: https://atcddd.fhi.no/atc_ddd_index/
26. Nehretskii S. Interdisciplinary Forensic and Pharmaceutical, Organizational and Legal, Clinical and Pharmacological Study of abuse of Psychoactive Substances. *SSP Mod Pharm Med.* 2023;3(1):1-18. doi: <https://doi.org/10.53933/ssppmpm.v3i1.85>
27. Gudzenko A. Substantiation of components of the national list of medicines of domestic production for pharmaceutical provision of affected persons in conditions of the special period in Ukraine. *SSP Mod Pharm Med.* 2021;1(1):1–6. doi: <https://doi.org/10.53933/ssppmpm.v1i1.15>
28. Manikandan S, Gitanjali B. Use of ABC and VED analysis in medical store inventory control. *J Acad Hosp Adm.* 2005;17(1):15–18. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3021698>
29. Devi R, Murthy AS, Rajya Lakshmi K. ABC-VED analysis of pharmaceutical inventory management in a government hospital of Vijayawada, Andhra Pradesh. *Int J Basic Clin Pharmacol.* 2018;7(4):645–648. Available from: <https://www.ijbcp.com/index.php/ijbcp/article/view/2375>
30. Shantanu K, Sharma R, Prakash R, Jain S, Agarwal D. ABC and VED analysis of the pharmacy store of a tertiary care teaching institute of India. *J Young Pharm.* 2010;2(2):201–205. PMID:23901172