# Interdisciplinary Legal, Forensic and Pharmaceutical, Forensic and Chemical, Forensic and Narcological, Forensic and Toxicological, Criminal and Legal Study of the Illegal Trafficking of Amphetamine

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**Abstract.** Noted that the illegal circulation of amphetamine in the world is growing. A legal, forensic and pharmaceutical, forensic and chemical, forensic and narcological, forensic and toxicological, forensic and psychiatric, criminal and legal study of the illegal circulation and distribution of amphetamine and its derivatives in an interdisciplinary context was conducted. The classification and legal group of amphetamine has been established. The experience of the international anti-narcotic association on the impact of amphetamine on life, the state of the body, and side effects was studied. Forensic and pharmaceutical analysis of criminal offenses was conducted. The results of a European online survey on the circulation of prohibited psychoactive substances in 21 EU countries, 9 non-EU countries, including Ukraine, were studied. Types of illegal amphetamines were analyzed. Drugs with amphetamine for the pharmacotherapy of narcolepsy were given. Forensic and pharmaceutical practice was summarized. Amendments and additions to Part 3 of Art. 307 of the Criminal Code of Ukraine regarding the strengthening of criminal liability for illegal trafficking of amphetamine were proposed. The peculiarities of the toxicology of amphetamine in the human body were given. The algorithm of pharmacotherapy of amphetamine addiction was summarized.

**Keywords:** amphetamine, illegal trafficking, pharmaceutical law, medical law, forensic pharmacy, organization of pharmaceutical business, forensic chemistry, criminal law.

**Introduction.** Amphetamine first entered Canada as an ingredient in over-the-counter medicines. For the treatment of diseases (narcolepsy, attention deficit hyperactivity disorder, depression). Amphetamine was banned when it was found to be addictive. Prohibited amphetamine derivatives are included in the Controlled Drugs and Substances Act in Canada. The court system can impose up to seven years in prison for habitual possession of amphetamines. Common pharmacy brand names of prescription amphetamines include Adderall, Dextrostat, Desoxyn, and ProCentra [1].

According to the Canadian Center on Substance Abuse and Addiction [2], amphetamine, methamphetamine was found in 33% of overdose deaths in British Columbia during 2016-2019.

Previously, amphetamine was brought to Ukraine from abroad. In recent years, members of organized criminal drug gangs have established illegal production in Ukraine with the involvement of specialists. Amphetamine and its derivatives have become the second most criminal psychotropic substance [3]. United Nations experts state that the number of criminal drug laboratories discovered by law enforcement agencies in Ukraine has significantly increased. In 2019, 17 laboratories were liquidated (5 produced amphetamine); in 2020 – 79 laboratories were liquidated (67 produced amphetamines) [4, 5].

Studies show that among all latent users of psychoactive substances, 18% use amphetamine. Among young people between the ages of 18 and 24, a third of all respondents said that they have people in their environment who abuse amphetamine [6]. Until now, there were no interdisciplinary context in the research of prohibited psychoactive substances in Ukraine and the world, which made the work relevant.

**The purpose of the study** was to conduct an interdisciplinary legal, forensic and pharmaceutical, forensic and chemical, forensic and narcological, forensic and toxicological, forensic and psychiatric, criminal and legal study of the illegal circulation and distribution of amphetamine and its derivatives.

**Materials and methods.** A study of mandatory materials accumulated at the Department of Medical and Pharmaceutical Law, General and Clinical Pharmacy of the Kharkiv Medical Academy of Postgraduate Education was conducted during cooperation with the investigative department of the Ministry of Internal Affairs of Ukraine in the Kharkiv Region and the Department of Health Protection of the Kharkiv Regional State Administration. Accusative conclusions were studied, systematized and analyzed; conclusions of forensic and medical, forensic and narcological, forensic and psychiatric, forensic and pharmaceutical, forensic examinations; judgments of courts in criminal cases; examples from forensic pharmaceutical practice regarding the use of psychoactive substances.

Research methods were regulatory, documentary, bibliographic, semantic, statistical, descriptive modeling, systemic approach, retrospective, comparative, systematic, tabular graphic, forensic-pharmaceutical.

The research of the article is a fragment of research works of Kharkiv Medical Academy of Postgraduate Education on "Improving the organizational and legal procedure for providing patients with drugs from the standpoint of forensic pharmacy, organization and management of pharmacy" (state registration number 0116U003137, terms 2016-2020) and "Pharmaceutical and medical law: integrated approaches to the system of drug circulation from the standpoint of forensic pharmacy and organization of pharmaceutical business" (state registration number 0121U000031, terms 2021-2026); Petro Mohyla Black Sea National University on the topic "Conceptual interdisciplinary approaches to the drug circulation system, taking into account organizational and legal, technological, biopharmaceutical, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmacoeconomic, pharmacotherapeutic aspects" (state registration number 0123U100468, implementation period 2023-2028); Luhansk State Medical University "Conceptual interdisciplinary approaches to pharmaceutical and availability of drugs, taking into account organizational and legal, technological, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmacoeconomic, marketing, social and economic competencies" (state registration number 0123U101632 , terms 2023-2027).

**Results and discussion.** Amphetamine and its derivatives are included in Table II, List No. 2 "Psychotropic substances, the circulation of which is restricted" of the List of narcotic drugs, psychotropic substances and precursors [7]. According to the classification and legal classification of psychoactive substances, amphetamine is a psychotropic substance.

Experts of the International Anti-Narcotics Association note the impact of amphetamine on a person's life [8]:

- cheerfulness, the person does not feel the need for sleep and rest;
- sharply elevated mood, not always to the appropriate situation;
- increased sociability, friendliness and openness;
- loss of feeling of hunger, pain and fatigue;
- decrease in the level of fear, anxiety and safety.

This is what contributes to the popularity of the psychoactive substance among those who have problems with adaptation in society, who have a lot of work or a nocturnal lifestyle. The effect of the high after taking the substance lasts from 2 to 48 hours, depending on the accompanying factors and the characteristics of the body.

Side effects of amphetamine abuse:

- anxious and depressive states;
- weakness, sleep more than 12 hours;
- weakness, lethargy, nausea;
- feeling cold symptoms, sore throat, cough, etc.

The side effects encourage you to use amphetamine again and again and again and again. The dose is increased by 2-5 times. In the future, it is monitored:

- spontaneous, unsystematic, uncontrolled abuse, "amphetamine marathon";
- excessive activity (superactivity) for several days, which ends with a complete or sharp decline in strength and exhaustion, unawakened sleep for more than a day;
- the psychoneurological system and physical condition of the person are destroyed;

- abuse of amphetamine in large doses forms a mental and physical addiction, disrupts the functioning of the body and its individual organs (sight, memory, movement, hearing, cardiovascular system).

First psychological aid consists of the five steps: "Recognize - Acknowledge - React - Redirect - Track" [9]. The pan-European analysis for 2022 assessed the wastewater of approximately 54 million people in more than 100 European cities that participated in the program. The use of 5 prohibited psychoactive substances was monitored: cocaine, amphetamine, methamphetamine, MDMA (ecstasy), cannabis. Ketamine was also included in the analysis [10]. Traces of consumed psychoactive substances will enter the sewage network (in unchanged form or in the form of a mixture of metabolites). Metabolites, end products of metabolism, are substances that are formed when the body breaks down drugs, agents and substances. Wastewater analysis was based on the urinary excretion of traces of almost everything a person consumes, including banned psychoactive substances. The target residue of narcotic drugs and psychotropic substances is what remains in wastewater after removal and is used to quantify the consumption of prohibited psychoactive substances by the population of a city, bar, street, school, etc. In the future, analytical chemists (analytical pharmacists) look for urinary biomarkers (measurable characteristics for calculating the use of narcotic drugs and psychotropic substances by the population) in wastewater samples, which can be the original psychoactive drug (i.e., the main substance) or its metabolites in urine. The process by which researchers calculate the population's consumption of banned psychoactive substances is based on the amount of target residues of psychoactive substances that enter treatment facilities. Tandem mass spectrometry is an analytical method that is most often used to quantify drug residues in wastewater. Chromatography is a method of analytical chemistry that combines the separation methods of liquid chromatography with the analysis capabilities of mass spectrometry. Given the complexity and low concentrations expected in wastewater. The combination of spectrometry and chromatography is one of the most powerful techniques for this analysis because of its sensitivity, specificity, and selectivity. The study included 75 cities in 23 countries of the European Union, Norway and Turkey [11]. Certain cities, which in the past showed a high level of consumption of prohibited psychoactive substances (London, Reykjavik) decided not to participate in the study. Experts tested cocaine, marijuana, amphetamine, methamphetamine and MDMA, better known as the party drug ecstasy, measuring residues in milligrams per 1,000 people per day. The results of the research were made public by The European Monitoring Center for Drugs and Drug Addiction (EMCDDA). Monitoring of wastewater showed a peak of amphetamines in Brussels at the beginning of the working week [10, 12].

**Table 1.** Forensic-pharmaceutical analysis of criminal offenses related to the drug and alcohol situation in Ukraine [38].

| **Criminal offenses registered against persons according to the Report on the drug and alcohol situation in Ukraine for 2022 (according to 2021 data)** | **Convicted persons according to the Report on the drug and alcohol situation in Ukraine for 2022 (according to 2021 data)** |
|---|---|
| In 2021, 29,587 (100.0%) criminal offenses were registered in the sphere of trafficking of narcotic drugs, psychotropic substances, their analogues or precursors, of which 11,579 citizens were served with a notice of suspicion of 21,949 detected offenses (crimes). | From the total number of convicts in 2021 under Art. 305-320 of the Criminal Code of Ukraine 8,737 citizens (proportion of served notices of suspicion of 2,021 offenses (75.4%). |

The experience of specialists from the United Nations Organization, Canada, and the countries of the European Union regarding the level of combating narcotization of the population is being studied in Ukraine. Scientific works of scientists Stefanov A.V., Trachtenberg I.M., Danylenko V.S., Sosin I.K., Chumak V.T., Gubskii Yu.I., Chuiev Yu.F., Shapovalova V.O., Linskii I.V., Shapovalov V.V., Gudzenko A.O., Osyntseva A.O., Nehretskii S.M., Bondarenko V.V., Malinina N.G. and others

devoted to the issues of improving the regulatory framework for the circulation of psychoactive substances, pharmacotherapy schemes for patients, the availability of medicines for all contingents on the basis of evidence-based medicine and pharmacy based on the principles of medical and pharmaceutical law, taking into account pharmaceutical and medical ethics and deontology [5, 13-37]. Forensic and pharmaceutical analysis of criminal offenses according to the report on the drug and alcohol situation in Ukraine for 2022 is given in the Table 1 [38].

The courts of Ukraine convicted 7,145 people (81.8% of the total number of those convicted in 2021 for illegal drug trafficking) for non-resonant crimes related to the possession of narcotic drugs and psychotropic substances for personal use (Art. 309 of the Criminal Code of Ukraine) (Fig. 1).

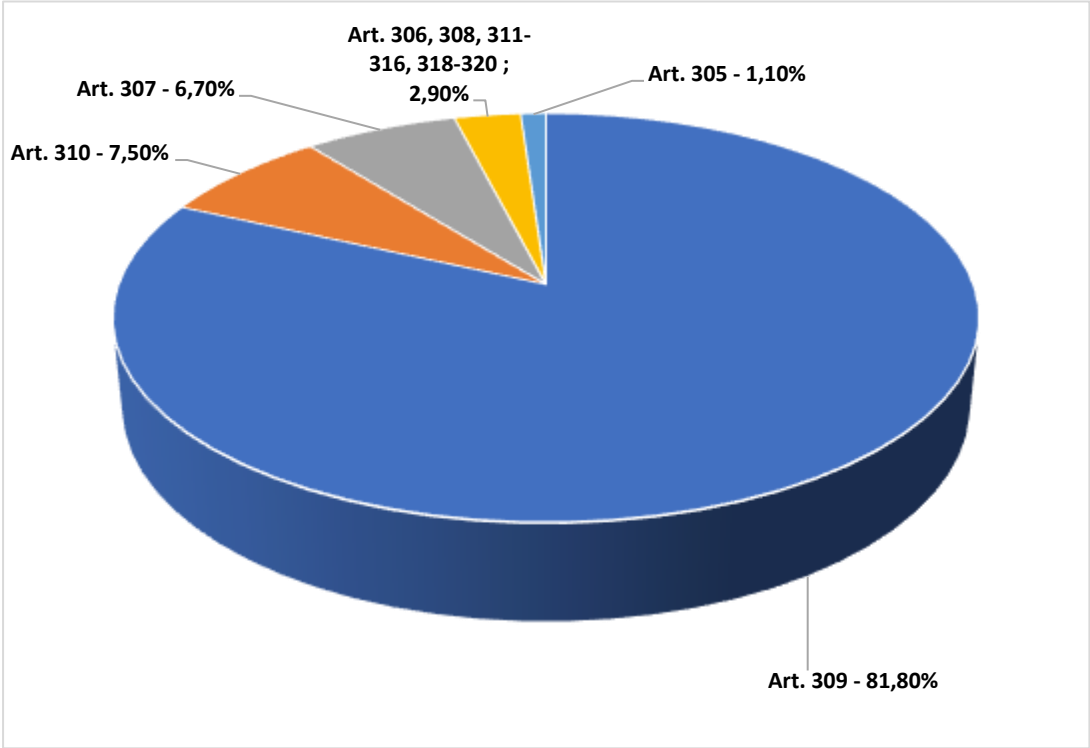


**Fig. 1.** Forensic and pharmaceutical characteristics of persons convicted of illegal trafficking of psychoactive substances under articles of the Criminal Code of Ukraine.

The European online survey on trafficking in illicit psychoactive substances collected data between March and May 2021 among persons aged 18 and over in 21 countries of the European Union and 9 countries outside the European Union, including Ukraine [39, 40]. According to the analysis, the majority of respondents reported that they used psychoactive substances during the last 12 months (Fig. 2): cannabis – 93%; alcoholic beverages – 92%; tobacco products – 89%; MDMA/ecstasy – 59.0%; amphetamine – 51.0%; LSD – 36%; cocaine – 21%; methamphetamine – 20%; opioids (except heroin) – 15%. Medicinal products containing opioids (91%). Powdered opioids obtained from illicit sources (43%). Home-made preparations containing opioids (32%); ketamine – 14%; heroin – 4%. Amphetamine and its derivatives occupy 71%.

Suggested that the Ministry of Internal Affairs of Ukraine formulate a new Strategy for 2020-2030 in the field of drug and psychoactive substance trafficking [41] in Ukraine:

- ✓ a big problem of the use of narcotic drugs and psychoactive substances in adolescence;
- ✓ abusing narcotics for non-medical purposes is a direct path to HIV/AIDS and worsening the criminal situation;
- ✓ more than 2 million people suffer from drug addiction;
- ✓ there is no legal norm that would consider such persons to be sick and not criminals, which prevents normal rehabilitation and resocialization and deprives them of specialized medical care;

- ✓ combating drug crime is based on the prevention of addictions, expanding the network of state centers to help drug addicts;
- ✓ development of new programs of pharmacotherapy and rehabilitation of drug patients.

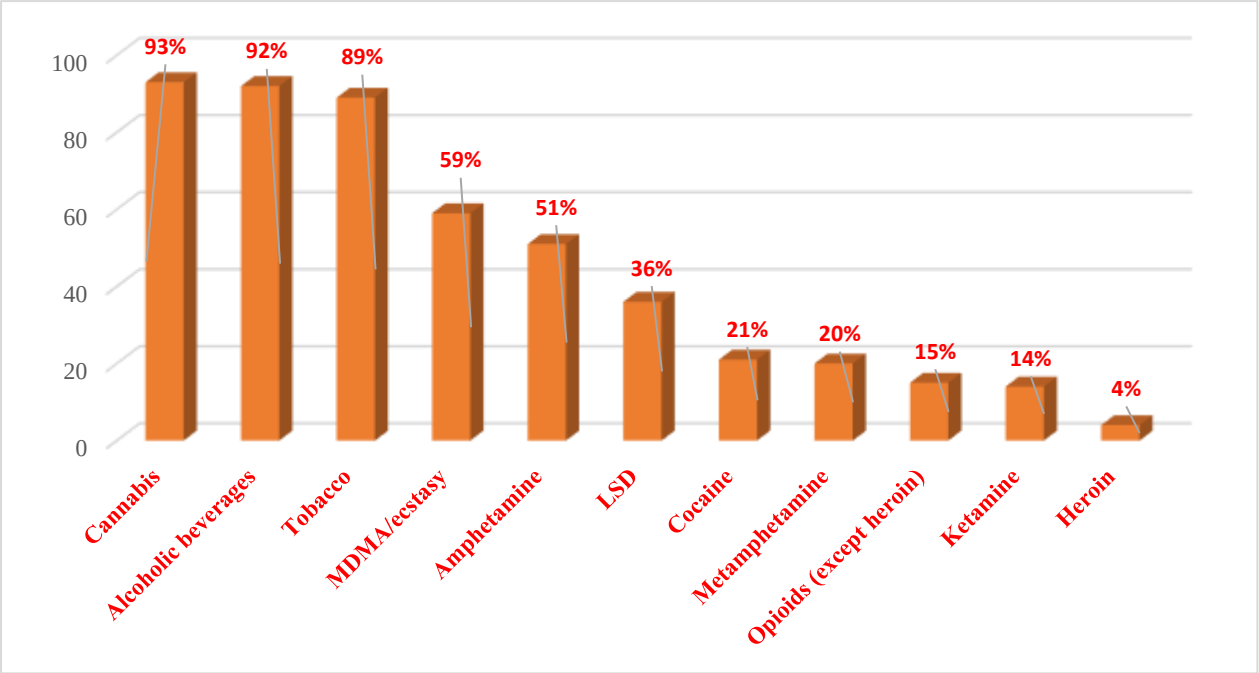


**Fig. 2.** The pattern of abuse of prohibited psychoactive substances and psychoactive drugs [39, 40].

On the other hand, as the lawyers of the Ukrainian Helsinki Union for Human Rights note, the system of combating drugs in Ukraine is very expensive. It needs to be reformed [42]. Today in Ukraine, more than half of all criminal cases related to the cessation of illegal circulation of prohibited psychoactive substances are brought under Art. 309 of the Criminal Code of Ukraine, which actually recognizes criminal punishment for individual consumption of psychoactive substances. Thanks to the existing drug policy, a huge number of citizens are detained in places of deprivation of liberty for crimes that do not cause real harm to society, which are not serious. Life has proven the effectiveness of countering the spread of drug addiction through the implementation of harm reduction programs: exchange of syringes; replacement maintenance therapy programs; rehabilitation programs. The problem requires a comprehensive approach – changes in the attitude towards drug addicts-citizens, as sick persons who need to be provided with vital medicines. An effective system of preventing the spread of drug addiction and socio-economic rehabilitation of people of different age groups can resist the drug trade and reduce the number of drug addicts.

Amphetamines are stimulants. Available in the form of tablets or powder. Common prescription names for amphetamines include Adderall® and Dexedrine®. They are used to treat narcolepsy [43-45]. The US classifies amphetamines as Schedule II drugs with a high potential for abuse. US federal laws set strict conditions for prescribing Schedule II drugs. Prescriptions for Schedule II drugs require written authorization, electronic prescriptions are prohibited. Taking Schedule II drugs (Adderall®) without a doctor's prescription carries a criminal charge.

Types of illegal amphetamines [46]:

- ❖ Amphetamine (street name: sticky whistle, speed, whiz, appers, louee, goey, speed);
- ❖ Methamphetamine in the form of solid crystals (street slang: base, wax, pure, whiz, d-meth, crystal, ice, glass, speed, meth, fast);
- ❖ Methamphetamine in liquid form (street slang: leopard blood, red speed, bull blood);
- ❖ Dextroamphetamine (street slang: pep pills, kiddie-speed, uppers);
- ❖ Ecstasy (street slang: MMDA, molly).

Amphetamine available to legal consumers in the following forms:

- Liquid;
- Crystal;
- Capsules, tablets;
- Paste, powder.

Below there are summarized examples from forensic and pharmaceutical practice (No. 1-6). Systematized facts from organized criminal drug gangs, which established the production of amphetamines in drug laboratories, sales through an extensive wholesale and retail network. The condition of drug addicts during the forensic medical examination is carried out in accordance with the rules of forensic determination of the severity of bodily injuries in accordance with the Order of the Ministry of Health of Ukraine dated 17 January, 1995 No. 6 "On the development and improvement of the forensic medical service of Ukraine" (Registered in the Ministry of Justice of Ukraine July 26, 1995 under No. 248/784) [47].

*Example from forensic and pharmaceutical practice No. 1.* Investigators of the National Police in Kyiv, under the procedural leadership of the prosecutor of the Kyiv City Prosecutor's Office, opened a criminal case, exposed and detained 4 people who set up two drug laboratories and carried out the manufacture and sale of the psychotropic substance amphetamine in particularly large quantities for part 2 and part 3 of Art. 307 of the Criminal Code of Ukraine [48]. During the pre-trial investigation, established that on March 13, 2023, operatives of the National Security Service of Ukraine detained four members of an organized criminal drug gang operating in the city of Kyiv and the Kyiv region who organized the production of amphetamine. Amphetamine was sold to trusted persons "from hand to hand", as well as through mail. Law enforcement officers seized: 1.1 kg of amphetamine, which is a psychotropic substance; ecstasy in pills; cannabis, a particularly dangerous drug; precursors; laboratory equipment; chemical reagents; electronic scales; cash; computer equipment; means of communication with sales channels. The estimated value of the seized materials is about 500,000 hryvnias. Monthly drug profits amounted to about 2 million hryvnias. The criminals were detained in accordance with Art. 208 of the Criminal Procedure Code of Ukraine, 4 members were notified of the suspicion and the court chose preventive measures – detention.

*Example from forensic and pharmaceutical practice No. 2.* Investigators of the National Police in Khmelnytskyi region, under the procedural guidance of the prosecutor's office of Khmelnytskyi region, detained four main members of an organized criminal drug gang, who were charged with suspicion under Part 2 and Part 3 of Art. 307 of the Criminal Code of Ukraine [49]. The production and sale of psychoactive substances was organized. The defendants specially rented an apartment to manufacture amphetamine. The goods were sold to buyers personally or by the method of "bookmarks" in separate places. According to the prices of the "black market", the equipment of the "store" reached more than half a million hryvnias every month. Every day, criminals sold about 50 doses of amphetamine to citizens. The police seized from illegal circulation: amphetamine; more than 3 kg of cannabis; precursors; equipment for the production of amphetamine; electronic scales; Mobile Phones; money obtained by crime. The criminals were detained in accordance with Art. 208 of the Criminal Procedure Code of Ukraine, 4, the suspicion was reported and the court chose preventive measures – detention. After receiving the results of forensic pharmaceutical and other forensic examinations, the issue of additional qualifications for the criminal activity of the intruders will be decided. The pre-trial investigation is ongoing.

*Example from forensic and pharmaceutical practice No. 3.* Investigator of the National Police in Vinnytsia region from the procedural management of the prosecutor's office of the Vinnytsia region notified 5 residents of the regional center (four men and one woman, aged from 36 to 58 years old), who were members of an organized criminal drug group, on suspicion of committing a crime, provided for in Part 2 of Art. 307 of the Criminal Code of Ukraine [50]. During the pre-trial investigation, established that on April 21, 2023 in Vinnytsia, the KORD special unit with the participation of operatives of the Criminal Investigation Department detained five criminals who, during 2022-2023, created an extensive network of sales of psychotropic substances and narcotic drugs. Worked according to clearly assigned roles and developed schemes. They had their own responsibilities, which included packaging and direct sales of prohibited psychoactive substances,

searching for new customers. Worked with small "clients" and wholesale suppliers. During court-sanctioned searches by investigators, in the presence of witnesses, the following were found and seized at the criminals' residences: more than 0.25 kg of amphetamine; 2 kg of hemp, which is a narcotic drug; electronic scales; zip-packs; Mobile Phones; bank cards; money obtained by criminal means. The organized criminal group earned up to 500,000 hryvnias per month from the sale of amphetamine. The criminals were detained in accordance with Art. 208 of the CPC of Ukraine. Suspicion reported. The court chose preventive measures in the form of detention. After receiving the results of forensic pharmaceutical and other examinations, the issue of additional qualifications for the criminal activity of the perpetrators will be decided. The pre-trial investigation is ongoing.

*Example from forensic pharmaceutical practice No. 4.* Investigator of the territorial unit of the Stryi National Police in Lviv region under the procedural guidance of the Stryi District Prosecutor's Office informed the perpetrators (a 40-year-old man and a 36-year-old woman) of the suspicion of committing a criminal offense, provided for in Part 2 Article 307 of the Criminal Code of Ukraine [51]. During the pre-trial investigation, it was established that on March 1, 2023, two residents of the district center, who were selling psychotropic substances to residents of the district, were detained by operatives of the criminal police in the Stryi district of the Lviv region. During court-sanctioned searches, investigators in the presence of witnesses found and seized: 0.1 kg of amphetamine in a package at the residences of the suspects; means for packing substances; funds received from illegal activities; other physical evidence. Physical evidence is sent for forensic examination. The court chose a preventive measure for the suspect – detention with the possibility of posting bail. The pre-trial investigation is ongoing.

*Example from forensic pharmaceutical practice No. 5.* Investigator of the Police Department of the Uzhhorod district administration of the State Public Health Service in the Transcarpathian region. Criminal proceedings have been opened under Part 2 of Art. 307 of the Criminal Code of Ukraine [52]. During the pre-trial investigation, it was established that on June 15, 2023, in the city of Chop, employees of the police department No. 1 of the Uzhgorod district administration of the National Security Service of Ukraine in Zakarpattia region conducted a series of secret measures, as a result of which they managed to stop the criminal activities of a 36-year-old woman who sold amphetamine to citizens. The police arrested the suspect on one of the streets of the city of Chop, during another sale of amphetamine to a customer, and it was recorded how the criminal passed a package with a psychotropic substance "from hand to hand" and received cash in return. In accordance with Article 208 of the Criminal Code of Ukraine, the suspect was placed in a temporary detention center. The court is considering the issue of selecting a preventive measure – detention. Investigative activities are ongoing, investigative measures are being taken to establish the location of the laboratory and all participants.

*Example from forensic pharmaceutical practice No. 6.* Under the procedural leadership of the district prosecutor's office, a criminal proceeding was opened by the investigator of the Lutsk district police department in Volyn region under Part 3 of Art. 311 of the Criminal Code of Ukraine [53]. It was established that on August 8, 2022, in the city of Lutsk, employees of the Department of Strategic Investigations in the Volyn Region found a package with a yellow powdery substance, which is used for the synthesis of amphetamine, in the possession of a 38-year-old resident of Lutsk. The investigative and operative group of the Lutsk District Police Department arrived at the scene of the incident. An inspection of the scene was carried out by recording the fact of the offense committed by a 38-year-old man from Lucknow and seizing material evidence from him in the presence of witnesses. The substance was sent for forensic pharmaceutical research to the Volyn scientific-research expert forensic center of the Ministry of Internal Affairs of Ukraine. A pre-trial investigation is ongoing.

The experience of the criminal legal and judicial system of the Kingdom of Saudi Arabia regarding the effective work of law enforcement and judicial bodies in detecting crimes related to the illegal circulation of amphetamine is given in the example of forensic pharmaceutical practice No. 7.

*Example from forensic pharmaceutical practice No. 7.* On Jule 13, 2023, the Criminal Court in the city of Abha decided to sentence a citizen of the Kingdom of Saudi Arabia to 25 years in prison

and deprivation of liberty. For the second time, he was found guilty of selling 25 prohibited psychotropic amphetamine tablets [54]. In addition to imprisoning the citizen for 25 years, the court also prohibited him from leaving Saudi Arabia for 25 years after the end of his prison term.

Examples from forensic and pharmaceutical practice indicate that the problem of illegal amphetamine trafficking is acute.

Important to take into account the experience of the USA, where the law recognizes as a crime the possession and sale/sale of amphetamine without a doctor's prescription [55]. Criminal liability depends on whether a person is prosecuted under state or federal law. According to federal law (21 USC §844 (2022) for actions related to the illegal possession of amphetamines, the following penalties are imposed: first offense - up to one year in prison, up to $1,000 in fines, or both; second offense – from 15 days to 2 years in prison, a fine of up to $2,500, or both; third or subsequent offense – 90 days to 3 years in prison, a fine of up to $5,000, or both.

The experience of Saudi Arabia deserves attention [56]. In April 2021, more than five million white amphetamine tablets hidden in pomegranate fruits were found and seized in the Saudi port of Jeddah. In November 2021, 2.3 million captagon tablets were seized at the Al-Hadith crossing on the border with Jordan. In August 2022, 46,916,480 amphetamine tablets were found and seized at the port of Riyadh. In 2021, 5 million captagon tablets were seized from a shipment of grenades delivered from Beirut, Lebanon.

The experience of Jordan shows the fight against organized criminal drug gangs [57, 58]. Since the beginning of 2022, more than 17 thousand packages of hashish and 17 million captagon tablets have been intercepted. In all of 2021, 15.5 million captagon tablets were seized. In 2020, 1.4 million captagon tablets were seized. In January 2022, 27 drug smugglers supported by "armed groups" were killed. In the city of collision, the military found a large number of narcotics.

The world trade in captagon is growing rapidly [56, 59]. According to the United Nations Office on Drugs and Crime (UNODC), between 2015 and 2019, 44% of captagon seizures were made in the Middle East, 26% of which were in Saudi Arabia.

Saudi Arabia is the largest market for amphetamine and pills with the captagon logo [60]. Captagon is a mix of amphetamine, caffeine and various fillers. It is one of the most popular drugs among wealthy youth in the Persian Gulf. Improves mood, silences fear, gives a feeling of euphoria, relieves boredom and social restrictions, but causes long-term health hazards.

The experience of the countries of the world in combating the illegal circulation of amphetamine is important for Ukraine as well [61-63]. Amendments and additions to Part 3 of Art. 307 of the Criminal Code of Ukraine regarding the strengthening of criminal liability:

The actions provided for in parts one or two of this article were committed by an organized group, as well as if the subject of such actions were narcotic drugs, psychotropic substances or their analogues in particularly large quantities, or were committed with the involvement of a minor, a minor or a pregnant woman or in relation to a minor or a pregnant woman or if they caused the death of a person or other serious consequences, - shall be punished by imprisonment for a term of twelve to 25 years or life imprisonment, a fine of 100,000 to 500,000 of the tax-free minimum income of citizens. with confiscation of property.

The publication of Kozlov S.V. deserves special attention. in co-authorship [63]. The materials of 58 forensic medical studies, which died from the abuse of amphetamines, are given. All the deceased were men, the average age was 28.8 ± 6.7 years.

Anesthesiologist Onipchenko B.P. notes that drug intoxication with pronounced symptoms – vegetative-vascular reaction, motor and mental disorders – lasts only a few hours [64]. Traces of amphetamines can be detected during forensic medical, forensic toxicological, forensic histological, forensic pharmaceutical or forensic drug examinations. After consumption, the psychoactive substance enters the bloodstream, where it begins to disintegrate after a few hours. Most often, blood tests reveal the breakdown products, metabolites. Antibodies to amphetamines are produced in the blood, which can be detected even after several months (quarterly test). Amphetamines and their metabolites are detected in the urine longer than in the blood, after complete excretion by the kidneys. Without a special course of detoxification, it is impossible to completely cleanse the body of the

breakdown products of amphetamines. Amphetamines can be deposited in adipose tissue. During physical exertion, which is accompanied by fat burning, microdoses enter the bloodstream. Even after a single use, traces of amphetamines can be detected in nails, hair, saliva and urine after several times, days or months.

The term of withdrawal of amphetamine and the combination of coffee+alcohol+amphetamine from the human body, according to doctor Adamchenko C. from the "Ukrainian Center for the Treatment of Addiction", depends on [65]: age and general state of health of the person; the state of the liver, kidneys, circulatory system, cardiovascular system; Amphetamine, LSD, heroin, morphine break down and are removed from the blood the fastest; marijuana and its products stay in the body the longest; quality and degree of purification (thoroughly purified drug is excreted faster, low-grade drug –slower); the period of elimination of amphetamine is directly proportional to its amount; with one-time use, amphetamine is excreted faster, with regular use - slowly; experience of use (the longer a person uses amphetamine, the more metabolites and antibodies accumulate in the body (blood, urine, saliva, tear fluid, hair, nail plates), the more time is needed for complete cleansing of the body (fat tissues, blood flow, cardiovascular organs, liver, kidney) [66, 67].

Treatment of drug addicts in the conditions of primary medical care will allow to significantly increase the level of their coverage and socialization [68].

The algorithm of pharmacotherapy of amphetamine addiction is carried out according to the following stages [69]:

- interruption of withdrawal syndrome;
- detoxification pharmacotherapy;
- symptomatic pharmacotherapy;
- psychotherapy;
- rehabilitation course;
- control during the recovery period.

Pharmacotherapy of amphetamine addiction in the clinic is carried out according to individual programs, which are made taking into account the severity, duration of use and psychotype of the patient. On the first day of the patient's admission, a detailed diagnosis and assessment of the condition is carried out. Pharmacotherapy begins with detoxification and administration of drugs that block amphetamine and its breakdown products. Clinical and pharmacological groups: tranquilizers – sibazone, diazepam, lorazepam, parsicol; antipsychotics – aminazine, halopril, haloperidol, sonapax, triphtazine; adrenoblockers – propranolol, cardacet. A set of motivational measures to change the patient's thinking and encourage him to voluntarily get rid of amphetamine addiction is a mandatory addition to the course of treatment. There are programs of medical detoxification in hospital conditions [70-73]:

- 1st stage – medicinal detoxification with the use of extracorporeal methods of rehabilitation and purification (membrane plasmapheresis, laser therapy, sorption therapy, infusion correction, strengthening, hepatoprotective and antidepressant medical intervention);
- 2nd stage – psychotherapeutic assistance;
- 3rd stage – rehabilitation in the conditions of a therapeutic community;
- 4th stage – blocking pharmacotherapy with modern drug prolongers of the class.

These procedures can be performed only in the conditions of a clinic, that is, a hospital. It may take up to 20 days for the body to be completely cleansed from the effects of psychoactive substances, during which the patient is under the constant supervision of medical personnel, the patient may be given emergency aid, resuscitation measures or a corrected pharmacotherapy plan at any time.

**Conclusions.** A legal, forensic and pharmaceutical, forensic and chemical, forensic and narcological, forensic and toxicological, forensic and psychiatric, criminal and legal study of the illegal circulation and distribution of amphetamine and its derivatives in an interdisciplinary context was conducted. The history of the origin and circulation of amphetamine in the world has been studied. The classification and legal sign of amphetamine was established. The experience of the international anti-narcotic association on the impact of amphetamine on life, the state of the body, and side effects was studied. The literature data on the evaluation of wastewater for monitoring the

use of amphetamine in 23 EU countries, Norway, and Turkey were analyzed. A forensic and pharmaceutical analysis of criminal offenses was conducted. The results of a European online survey on the circulation of prohibited psychoactive substances in 21 EU countries, 9 non-EU countries, including Ukraine, were studied. Types of illegal amphetamines were analyzed. Drugs with amphetamine for the pharmacotherapy of narcolepsy were given. Forensic and pharmaceutical practice was summarized. Amendments and additions to Part 3 of Art. 307 of the Criminal Code of Ukraine regarding the strengthening of criminal liability for illegal trafficking of amphetamine were proposed. The peculiarities of the toxicology of amphetamine in the human body were given. The algorithm of pharmacotherapy of amphetamine addiction was summarized.

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