## *Анотації наукових робіт*

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**RATIONALITY AND SAFETY OF PHARMACOTHERAPY ASSESSMENT IN GERIATRICS (ON THE EXAMPLE OF TRAUMATOLOGICAL PROFILE PATIENTS)**

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**The aim of the research:** comparative assessment of rationality and safety of pharmacotherapy in elderly patients' of traumatological profile by means of identification of drug-related problems (DRP).

**Materials and methods:** The study design is a comparative retrospective analysis of 53 Protocols Drug order Forms (PDOF) (25 vs 28) patients' of traumatological profile of 2 in-patient establishments of Ukraine Health Care *(hospital-1 and hospital-2)*, which were discharged in a satisfactory condition, to assess the rationality and safety of NSAIDs and other drugs prescribed in schemes pharmacotherapy. Information resources for analysis included: patients' PDOF, drug's instructions for medical use; State drugs Formulary (4th edition); clinical protocols approved by the Health Care Ministry of Ukraine as a standard of good practice prescribing pharmacotherapy; data of evidence-based medicine; drug interaction checker. The following methods were used: system analysis; modern information search; analytical, comparative; clinical and pharmaceutical; clinical and pharmacological; statistical. During the research conflicts of interests were not present.

**Results:** The obtained results proved the potential negative impact on the safety and rational pharmacotherapy of the examined elderly patients, since the following aspects were detected: polypharmacy (100% of cases), failure to comply with instructions for medical use (88%), prescribing of several drugs from the same pharmacotherapeutical group (6%), neglect of comorbidity and age pharmacokinetic changes in patients (6%).

**Conclusions:**

1. In the analyzed 25 and 28 patients of 2 inpatient settings, 4 identical main rubrics of DRP were identified, with the largest being drug-drug interactions– 62% and 57%, respectively; technical problems – 16% vs 18%; drugs selection problems– by 16% and drugs dosage problems– 6% vs 8%.
2. Total number of DRP analyzed in hospital-1 and hospital-2 was 280 vs 336, respectively. Thus, we can assume the existence of identical systemic DRP in prescribing pharmacotherapy for elderly patients' in other inpatient settings of Ukraine.
3. However, in 25 patients of hospital-1 a significantly higher number of severe drug-drug interactions was found in comparison with 28 patients of hospital-2 ($p=0,01$), and there is a problem «excessive frequency of drug use» in contrast to hospital-2, where this rubric is absent. However, in patients of hospital-2 the problem «no indications for drug's use» was found, which is absent in patients of hospital-1. It is revealed that the problem of excessive duration of drug use is more characteristic for the hospital-2 in comparison with the hospital-1 ($p<0,001$). It is proved that combination of problems of excessive duration of drug use and drugs duplication is in 5.5 times more often observed in patients of hospital-2 than of hospital-1 ($p<0,01$).
4. We believe that it is reasonable and indispensable to inform physicians about common mistakes in prescribing, in particular, according to the conducted study results. It will improve the life quality, enhance efficiency and safety of pharmacotherapy of elderly patients and prevent and/or minimize the risk of DRP complications. The involvement of a clinical pharmacist in the process of identification, analysis and development of adequate measures for prevention and avoidance of DRP in geriatrics, including by means of creation of a database «Systemic DRP», may be, in our opinion, a perspective direction of professional activity of this specialist.

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## EFFICACY OF PARENTERAL APPLICATION OF PROGESTERONE IN NONCARRYING OF PREGNANCY IN PATIENTS WITH ENDOCRINE INFERTILITY IN ANAMNESIS

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**The aim of the research:** Investigation of efficacy and endurance of progesterone parenteral application in noncarrying of pregnancy in patients with endocrine infertility in anamnesis.
**Materials and methods:** clinical, immunoenzymatic, immunochemoluminescentic methods, dopplerometry, ultrasound investigation, statistical method.
**Results:** It has been shown in the course of treatment of noncarrying of pregnancy in patients with endocrine infertility in anamnesis, that the application of parenterals progesterone reduced the hypoprogesteronemia and features of threatened abortion. Pain syndrome disappeared in 3–4 days from the beginning of the treatment and bleeding was reduced in 2–3 days and stopped during 5–6 days of therapy. As a result of conducted treatment the pregnancy has been saved in 97% of patients with noncarrying of pregnancy with endocrine infertility in anamnesis.
**Conclusions:** Preserving effect of parenteral progesterone is associated with immunological properties and it causes the high efficacy in therapy of noncarrying of pregnancy in patients with endocrine infertility. High efficacy, good endurance, economic availability and patients' satisfaction have been noted during the course of treatment with 2,5% solution of progesterone. The research results enable to recommend this medicine for administration in noncarrying of pregnancy in patients with endocrine infertility in anamnesis.

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## CHRONIC MORBIDITY RATE IN MEDICAL STUDENTS DUE TO RESULTS OF CLINICAL EXAMINATION

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**The aim of the research:** Scientific substantiation of chronic morbidity rate in medical students for elaboration of preventive health care programs.
**Materials and methods:** The object of study: 2594 medical charts (form 131) of students of medical faculty 1 and 2 of Danylo Halytsky Lviv National Medical University in 2012-2013 academic years. Used methods: medical statistics, structural and logical methods with regard to principles of systematic and comparative analysis.
**Results:** it is found that 11,3% of medical students belong to 3rd dispensary group – patients with chronic diseases who need treatment. Medical students are the most commonly diagnosed with diseases of the nervous system (23,9±2,9 cases per 1000 students), digestive system (20,0±2,8 cases per 1000 students), endocrine system, nutrition and metabolic disturbances (15,4±2,4 cases per 1000 students).
**Conclusions:** Results of the conducted study prove that:

- there is a larger share of females among all patients with chronic nosology, which is primarily attributed to larger number of women in higher medical educational establishments. However, morbidity rate on chronic pathology in male students in all, except third, years of studying, is higher compared to the same rate in female students;
- there is necessity in elaboration and implementation of organizational and functional model of prevention of health risk factors for medical students as the basis for health care for future physicians.

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**HEALTH CARE LEVEL OF INSTITUTIONS OF THE STATE CRIMINAL EXECUTIVE SERVICE OF UKRAINE AND ITS INFLUENCE ON THE HEALTH OF PENITENTIARY POPULATION**

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**The aim of the research:** To study the level of health care in establishments of the State Penitentiary Service in Ukraine and its influence on health of penitentiary population.

**Materials and methods:** The study design is retro-epidemiological study by means of sanitary-statistical methods. Object of study is the penitentiary population of Ukraine. The method of observation is continuous, that is it covers all the medical establishments and penal institutions of Ukraine.

**Results:** The level of health care based on the indicators of provision of prisons and penal institutions with physicians, nurses and hospital beds have been studied in dynamics (during 2006-2011). The provision level of prison medical facilities with physicians and nurses, a share of qualified doctors, the impact of health care on morbidity and mortality of prison and penal institutions contingent have been investigated.

**Conclusion:**

1. It was found that the overall level of health care for prison population of Ukraine in the last five years was up to standard and not worse, but better in comparison with the entire population of Ukraine.
2. The level of health care for pretrial detention centers and penal institutions is not significantly different. However, very low level of health care was observed in penal institutions of Vinnytsia, Zhytomyr, Zaporizhia, Donetsk and Kharkiv regions, in pretrial detention centers of Lviv and Kharkiv regions.
3. It was found that inpatient care for penal population has deteriorated recently. It is proved by the negative dynamics of in-hospital mortality, which increased to 62% from 2006 to 2011.
4. Taking into account the fact that other risk factors for prison populations are approximately at the same level and their contribution to the development of health indicators is the same, we study medical factor, its effectiveness, the major health risk factor for the prison population.

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**THE ROLE OF BRANCH STANDARDS IN THE HEALTH CARE SECTOR FOR ENSURING THE PRINCIPLES OF RATIONAL PHARMACOTHERAPY**

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**The aim of the research:** to assess the effectiveness of formulary system as a component of standardization system on the example of study of arterial hypertension pharmacotherapy in Ternopil region cardiology clinic before implementation of State Drugs Formulary and unified clinical protocol for arterial hypertension treatment, which was developed on the principles of evidence-based medicine.

**Materials and methods:** The primary data obtained from 156 medical records and Drugs Order Forms of inpatients treated in 2005, and 205 corresponding primary medical records of patients treated in 2012. The comparative and analytical, experts, statistical methods of analysis have been used in investigation.

**Results:** It is determined that in 2012 physicians commonly used group of drugs recommended by current medical and engineering documents, developed on the basis of evidence-based medicine – State Drug Formulary harmonized with the protocol of standardized medical care in hypertension. It is proved by change in range and scope of medical drugs in comparison with 2005. However, studies have shown that there are still problems in treatment of hypertensive patients, namely – insufficient use of drugs that affect blood clotting, and statins.

**Conclusions:** The results confirmed the validity of the formulary system, approved in Ukraine in 2009 at the state level and can serve as an information base for decision making for improving the quality of treatment for hypertension.

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## THYROID CANCER: OPTIMIZATION OF THE SURGICAL TREATMENT

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**The aim of the research:** elaboration of techniques for improvement of thyroid cancer surgical treatment standards due to the analysis of modern information sources and our investigation results.

**Materials and methods:** 308 patients with differentiated thyroid cancer treated traditionally (Group D1, n=149) and patients treated with radical surgical tactics (Group D2, n=159); patients with medullar cancer (n=84) were divided in two groups, radically treated during primary surgery (Group M1) and during secondary surgery (Group M2).

**Results:** The standard of thyroid surgery is thyroidectomy. Traditional surgery provides lymphatic dissection performed on basis of presurgical detection of lymphatic metastases. The proposed method provides obligatory central and lateral lymphatic dissection by means of diagnostic dissection. Prophylactic surgery is essential problem nowadays.

**Conclusions:**

1. The application of modern approaches to the diagnostics and surgical treatment of thyroid cancer in combination with suppressive hormone therapy and radiation therapy can improve quality of health care and thus the quality of life of patients with a tumour of the thyroid gland.
2. Analysis of existing clinical protocols for treatment of thyroid cancer, contemporary adequate information sources, clinical experience of Lviv State Regional Cancer Diagnostic and Treatment Center confirm the necessity of reviewing corresponding universal clinical protocols, bringing them in line with modern requirements to medical and technological standards and the possibility of creating on their basis the real ones for applying local clinical protocols.

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## RESEARCH METHODOLOGY ON THE HISTORY OF REMEDIOLOGY IN UKRAINE REVISITED

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**The aim of the research:** to outline methodological problems of scientific researches on the history of pharmacy on the example of analyzing modern researches and those published in the USSR concerning the history of national pharmacopeias creation; to elaborate a model for searching, processing, reconstruction and systematization of bibliographical literature.

**Materials and methods:** The object of the research was completeness and reliability of materials on the history of Russian and the USSR pharmacopeias in literature and electronic informational flows. The following approaches were used: systemic and historical, bibliographical and biographical, bibliosemantic, historical, cognitive, empirical and logical methods; and method of conceptual modeling for the substantiation of conclusions.

**Results:** The issues of reliability of factual material, its analysis and interpretation on the basis of evidence is a significant methodological basis of modern researches on the history of remediology, medicine and pharmacy. The results of this research have proved problems in methodology of historical remediology.

**Conclusions:**

1. The available information on the history of Ukrainian remediology, in our opinion, is incomplete and controversial. Literature sources on the history of medicine and pharmacy of the soviet period and some medical and historical researches of modern Ukraine are mainly compilation-based, biased and even politically engaged.
2. We believe that the methodological basis of researches and objective reconstruction of national remediology development involves, first of all, searching, collection, systematization and primary objective analysis of the factual material from the information sources of medical and non-medical character, profound knowledge of sources and biographical research on the history of medicine and pharmacy, the study of other tangible and intangible cultural memories on the lands of modern Ukraine and neighbouring countries.
3. Results of the analysis of historiographical sources prove that the first Russian state pharmacopeia, thus Ukrainian, was «Pharmacopoea Rossica». Therefore, chronology and national numbering of pharmacopeia, in our opinion, should be conducted from Karpyns'ky and Leontovich pharmacopeia (1798–1802), and the current Ukrainian Pharmacopoeia should be listed as the State Ukrainian Pharmacopoeia, 13-th edition.

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## FEATURES OF COMLIANCE IN THE SYSTEM «DOCTOR – PARENTS – PATIENT» IN THE TREATMENT CHILDREN WITH CYSTIC FIBROSIS. PART I

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**The aim of research:** to estimate different aspects of treatment compliance concerning parents of children with cystic fibosis (CF) due to socio-demographic factors and their correlations.

**Materials and methods:** 58 parents whose children suffer from CF were surveyed. The survey was conducted by interviewing, with using of questionnaire which includes 31 questions divided into blocks: passport data, physiotherapy, pancreatic enzymes, vitamins and general questions about therapy. Statistical analysis was carried out in the environment for statistical computing R 3.0.1. Fisher's exact test has been used to evaluate statistical significance and a polychoric correlation coefficient – to show the strength of possible relationships between the answers of respondents on different questionnaires and different socio-demographic characteristics.

**Results:** The study has showed that low compliance in urban residents occurs less frequently than in rural residents. Moreover, the longer the period of observation, the less compliance can be observed. With increasing age of parents the proportion of children who never missed drug intake decreases. The satisfaction with prescribed treatment is related to parents' education: 82% of those with secondary education are completely satisfied with the prescribed treatment, but only 38% of parents with higher education are completely satisfied and 58% are almost completely satisfied. If the duration of the observation of a child is less than two years, almost all parents always follow recommendations, whereas with increasing time of observation their following of recommendations is «almost always». The frequency of proper physiotherapy is statistically significantly associated

with a percentage of the required physiotherapy (φ=0,604, p=0,00048), because the more a child performs physiotherapy, the highest score is provided by parents concerning adequacy of these treatments.

**Conclusions:** There are about 250 factors that influence patient attitudes to the therapy regimen described in the literature. Here we exemplified the most significant ones that may be important for patients with CF. The questionnaire and the results of its application will help practitioners to find answers on various questions about the collaboration with patients and to understand the behaviour of families where a child with CF lives.

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## COMPARISON OF DRUG PRESCRIPTION DOCUMENTATION AT INPATIENT HEALTHCARE INSTITUTIONS OF UKRAINE AND GREAT BRITAIN (UK)

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**The aim of the research:** comparison of Inpatient Prescription and Administration Record (IP&AR) of *St. George Hospital* (London, UK) with medical treatment sheet (form № 003-4/a) (Ukraine) for its future application as a prototype for clinical pharmacist's medical documentation development at inpatient hospitals of Ukraine.

**Materials and methods:** Subject of the research: medical documentation of a clinical pharmacist. Objects of the research: medical treatment sheet form (№ 003-4/a) (Ukraine), Inpatient Prescription and Administration Record form (IP&AR) of *St. George Hospital* (London, UK), medical treatment sheets filled in at in-patient departments of the same specialization of 2 different Lviv hospitals (n1 = 35, n2 = 55), Ministry of Healthcare of Ukraine orders № 531 from 24.07.2009 and №184 from 26.07.1999. The systemic approach, bibliography, estimating and analytical-comparative analysis methods were applied in the research.

**Results:** A comparative analysis of medical treatment sheet form (№ 003-4/a) (Ukraine) and Inpatient Prescription and Administration Record form of *St. George Hospital* (London, UK) was conducted. The comparison of medical treatment sheets of inpatient departments of the same specialization of 2 different Lviv hospitals ($n_1$=35, $n_2$=55) showed that in all cases these documents weren't completely filled though, in our opinion, missing data are necessary for optimization of both physician's and clinical pharmacist's activity. The exigency of clinical pharmacist's medical documentation development in Ukraine was grounded.

**Conclusions:**

1. The results of the carried out analysis of 2 documents showed that the Inpatient Prescription and Administration Record (IP&AR) used in *St. George Hospital* (London, UK) and medical treatment sheet (form № 003-4/a) (Ukraine) are similar to each other according to their purpose, but differ significantly by the form of data presentation and its amount. Obviously, information specified by the physician in the form № 003-4/a is not enough for the detailed assessment of pharmacotherapy quality according to medical treatment sheet.
2. In our opinion, it would be reasonable to develop and implement the documentation of a clinical pharmacist at inpatient hospitals of Ukraine in order to optimize his activity there. It should contain the information on patient's condition, circuit peculiarities which are to be taken into account during pharmacotherapy and care delivery, pharmacotherapeutical anamnesis data (drug history including phytotherapy, OTC medications, homeopathic remedies, biological additives etc.) and pharmaceutical care of the patient which has been already provided (the list of activities towards compliance and concordance improvement, in particular).
3. We consider that the analyzed Inpatient Prescription and Administration Record of *St. George Hospital* (London, UK) should be used in the capacity of prototype for clinical pharmacist's medical documentation development, especially such its parts as allergies, sensitivities and adverse drug reactions, patient details, anthropometric measurement details (weight, height), medications history, infusion prescriptions, and the way of data presentation concerning separate regular non-infusion prescriptions. All mentioned above should be complemented with personalized pharmaceutical care plan. Keeping such documentation in the form of pharmacotherapy record chart by clinical pharmacists along with personalized pharmaceutical care plan will, in our opinion, facilitate pharmacotherapy rationalization as well as drug safety and efficacy monitoring at inpatient hospitals of Ukraine.

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## PREDICTION OF COST REIMBURSEMENT OF PHARMACEUTICAL CARE FOR PATIENTS WITH INFLUENZA

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**The aim of the research:** the development of methodologies for improving pharmaceutical service for patients with influenza by predicting reimbursement cost for antiviral therapy.

**Materials and methods:** The analysis results of influenza spread in 26 regions of Ukraine in dynamics (during 2000-2012 years), research of Ukrainian market of antiviral drugs, data of clinical and economic analysis of drug use in patients with influenza and the results of expert evaluation have been used in investigation. Mathematic and statistical, analytical methods are used in research.

**Results:** The technique of improving pharmaceutical care for patients with influenza was elaborated by predicting reimbursement cost of antiviral therapy. The proposed methodology consists of the following steps: determining the prescribing frequency of antivirals; prescribing intensity factor calculation; calculating the cost of pharmacotherapy with antivirals due to treatment protocols; calculating the annual demand for antiviral drugs recommended by clinical treatment protocols and the National Drug Formulary; predicting the number of influenza patients in administrative and territorial regions and prognostication of necessary insurance compensation for antiviral therapy for patients with the flu taking into account the inflation rate for the prognosticated period.

**Conclusions:**

1. The prognostication methodology for reimbursment of antiviral therapy cost for patients with influenza has been offered.
2. The prognosticated value of the reimbursement of antiviral medicines cost due to average influenza spread rate in Ukraine in 2014 is 2291050 UAH, that in terms on one patient with influenza corresponds to 65,57 UAH or 8,20$.
3. It was determined that in predictable compensation cost for antiviral drugs the largest part of reimbursement corresponds to oseltamivir (2014 – 89,38%) and the lowest to zanamivir (2014 – 0,30%).
4. Due to the analysis of prognosticated compensation cost for antiviral drugs in the regions of Ukraine it is established that the largest parameter is observed in Dnipropetrovk region 373174 UAH), and the lowest – in Zakarpattya region (1967 UAH).

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**OBTAINING OF SHIKONIN AND ITS ESTERS FROM THE ROOTS AND CALLUS CULTURE OF *LITHOSPERMUM OFFICINALE ERYTHRORHIZON***

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**The aim of research:** to obtain the shikonin and its ethers from natural raw materials and from callus culture of *Lithospermum officinale.*

**Materials and methods:** the seed and root of European gromwellg (*Lithospermum officinale E.*) from natural populations (Crimea) harvest in 2011 was investigated. The experiments were conducted by standard methods application using reagents of companies «Sigma-Aldrich» (Missouri, USA) and «Merck» (Darmstadt, Germany). The composition and structure of shikonin and its esters were confirmed by elemental analysis, thin layer chromatography, $^1$H NMR, UV and IR spectroscopy.

**Results:** Research of shikonin containing in the roots of *Lithospermum officinale E.* was carried out. The presence of shikonin in the amount of 0,17% by weight of dry product was established. The technique of the obtaining callus culture of plants and shikonin allocation from it was developed. The possibility of the obtaining of shikonin from the roots of intact plants and of cultivated phytomass *in vitro* was proved.

**Conclusions:**

1. The extractions of roots of *Lithospermum officinale E.* have been performed. It was determined and calculated that the quantitative value of shikonin and its esters in account of free shikonin in roots of *Lithospermum officinale E.* makes 0,17% of the weight of the dry product.
2. The method of introduction into in vitro culture *Lithospermum officinale E.* has been developed. The primary kalus have been obtained from roots of seedlings with using *Linsmayer-Skoog* medium, elaborated for plant culture of tissue-super producer.
3. The increasing of weight of dry kalus (28 g per 1 liter of culture medium) and shikonin content in dry kalus, which consists 5,2 g/l of free shikonin free was established

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**COMPARATIVE ESTIMATION OF EFFICIENCY OF BUPROPION ISOLATION ON TWO TYPES COLUMNS FOR SOLID-PHASE EXTRACTION**

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**The aim of the research:** optimal techniques of Bupropion isolation from liver; purification of acidic extracts by solid phase extraction on two columns: Isolute and H-klinoptilolite, and establishing optimal conditions for identification and quantification of Bupropion by gas-chromatography with mass-selective detection, which can be suitable in toxicological and forensic-chemical investigation.

**Materials and methods:** 0.1 N HCl solution was applied for bupropion isolation from liver. Obtained extracts were purified on two types SPE columns: reverse-phase *Isolute* and ion-exchange *H-klinoptilolite*. Conditions of H-klinoptilolite preparation for SPE columns making and optimal method for the extracts purification at pH 6-7 was elaborated. For estimation of isolation, concentration and purification efficiency with H-klinoptilolite was applied gas-chromatography hyphenated mass-spectroscopy.

**Results:** Calibration plot of bupropion quantification is $Y=1.44\times10^5X-1.53\times10^4$ (r=0.9991) in concentration range from 1 to 25 μg/ml. Isolute columns allow to isolate 80.8–87.3% of bupropion and H-klinoptilolite – 76.9–

87.6% on the first day of sample preparation. On the second day were found 75.8–82.9% and 74.8–86.2% of bupropion on Isolute and H-klinoptilolite columns respectively. Limit of bupropion quantification is 0.3 μg per 1 g of liver. Inner-serial error is not more 4.7% and 11,3% on the first day on consequent columns; on the second day – 6.5% and 8.4% respectively.

**Conclusions:**

1. Conditions of extracts from liver purification using SPE technique on Isolute and H-klinoptilolite columns were established. Isolute columns allow to isolate 75,8–87.3% of bupropion and H-klinoptilolite – 74,8–87.6%.
2. Degree of purification on H-klinoptilolite columns allows effectively identify the bupropion with mass-spectra.
3. GC-MS method of bupropion determination on HP-1 column was elaborated.
4. Limit of bupropion quantification is 0.3 μg per 1 g of liver.

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