ANNUAL REPORT
OF THE NATIONAL POISON CONTROL CENTRE

MILITARY MEDICAL ACADEMY, BELGRADE

2016

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Contents

Review of tables, figures and graphs

Republic of Serbia

According to data of the Statistical Office of the Republic of Serbia (01.01.2017.), Republic of Serbia had 7.040.272 inhabitants (without a data for AP Kosovo and Metohija). Administratively, the teritory of the Republic is divided into 30 districts (Figure 1), with Regional Health Centres in each of them. However, with the exception of the Clinics and the Clinical hospital centers, in a significant extent, they are not adequately staffed and technically qualified for a complete diagnostic and finale care of cases of severe poisoning by chemical substances in humans.

Figure 1 - Republic of Serbia, layout, administrative division

NATIONAL POISON CONTROL CENTRE

National Poison Control Centre (NPCC) is referent institution which provides medical prevention and treatment services for acute poisonings, detection of chemical substances in biological materials, water, soil and air, education in the fields of clinical toxicology and toxicological chemistry, as well as scientific research in the fields of toxicology and pharmacology.

In the Former Federal Republic of Yougoslavia, by relevant normative acts, in the 1997, NPCC was established as a state institution with the task „to organize and provide preventive care measures for poisoning, provide information on the effects of poisons, medical help measures in case of poisoning and eliminate the effects of poisoning“. Also, the National protection and rescue strategy in the emergency situations at the Republic of Serbia (2011) in the field of defining the tasks of the third level of health institutions states: "Based on the tasks of the National Poison Control Centre in the Field of disposal of acutely poisoned and exposed citizens in the case of a chemical accident or possible chemical terrorist attack, the Government has designated the National Poison Control Centre of the Military Medical Academy in the field of health and social care for a economic society, another legal entity of special importance for the defense of the Republic of Serbia".

The Center is created by integrating clinical and laboratory facilities of the former Clinic for Toxicology of the Military Medical Academy and Department for Medical Care of the Military Technical Institute. Since its inception, the Centre has grown in one of the most prestigious institutions of its kind in Europe in term of its results and capacities.

National Poison Control Center of the Military Medical Academy (NPCC MMA) today has Clinic for Emergency and Clinical Toxicology and Institute for Toxicology and Pharmacology and in its composition is Mobile toxicological-chemical team, which is activated in the case of larger chemical accidents. In the aforementioned strategic document of the Republic of Serbia, at the chapter about the Effects of Hazardous Substances states: "The National Poison Control Centre has a Mobile toxicological-chemical team that which is activated from the Center in the situation of massive chemical accidents. The main role of the mobile team would be the organization of medical care for those injured at the site of a chemical accident in which there is with a possibility or proven human casualties and harmed people".

In addition to the treatment of acute poisoning and providing information related to the toxicity of chemical substances, both for medical stuff and for the general public, permanent task of the NPCC is in the field of toxicovigilance. It involves monitoring the incidences of poisoning, seasonal variations in the incidence of poisoning, evaluation of efficacy and safety of antidotes, storage and supply of antidotes. It further involves reporting other health institutions on the necessary measures.

Picture 1 - Head of the National Poison Control Centre Prof. Slavica Vučinić MD PhD

More than half of the employees possess a university degree of various profiles (doctors, pharmacists, veterinarians, chemists), while the nursing staff is specially profiled for the specific requirements in the treatment and care of poisoned patients. The best evidence of the academic potential of this institution is the fact that the various departments of the Faculty of Medicine of the Military Medical Academy employ 3 full professors, 1 associate professor, 1 assistant professor and 3 assistants from the Center.

Abstract

Introduction: This is the seventh published Annual report of National Poison Control Center of the Military Medical Academy. In it, all available data are elaborated from the Department of resuscitation and triage, Clinic for Emergency and Clinical Toxicology and Department of Toxicological Chemistry PCC MMA. They also contain information about acute intoxications from those health institutions on the territory of the Republic of Serbia, whose reports are timely submitted to the Center.

Methodology: Data of the essential characteristics of patients and types of poisoning, the analytical procedures used to confirm the poisoning, as well as all other relevant indicators, are presented in tables and graphs in the Results chapter. At the end of report, short summary of all poison-related fatalities is presented on page 40. These data are analyzed by a team that consists of three had experienced clinical toxicologists from the Clinic for Emergency and Clinical Toxicology and a toxicological chemistry specialist from the Department of Toxicological Chemistry NCCP MMA. Their work is based on 6-graded RCF (Relative Contribution to Fatality) classification (Section List of Abbreviations and explanations).

Results: During 2016, the Department for reanimation and triage of Poison Control Centre registered 4747 cases. The largest number of them 2392; (52.2%) were patients registered due to the effects of ethyl alcohol from alcoholic beverages. Abuse of medicaments (1256; 27.4%) was the second and drugs of abuse (354; 7.7%) the third. The highest percentage of cases (over 79.0%) belongs to the working population. After health examination, 662 patients of the total number of patients, were addmited to Clinic for Emergency and Clinical toxicology of the Military Medical Academy. The leading causes of poisoning in hospitalized patients were medicaments, corrosive substances and drugs (72.1%; 8.6%; 4.8%). The lethal outcome was registered in 32 cases, of which 2 patients died during the treatment in DRT, the rest (30) during treatment at the Clinic.

Conclusion: Acute poisoning by chemical substances, continues to represent one of the major factors of morbidity and mortality in the Republic of Serbia. PCC has, therefore, a great importance in the structure of health services in Serbia. Furthermore, better material and staff support could additionally improve the quality of this institution's work in the future.

THE NATIONAL POISON CONTROL CENTRE OF THE MILITARY MEDICAL ACADEMY

In the National Poison Control Center of the Military Medical Academy, medical services for prevention and treatment of poisoning by chemical substances are provided, and in modernly equipped laboratory, detection and quantification of numerous chemical substances in biological materials, water, land and air are available. Scientific research in the fields of pharmacology, analitical and clinical toxicology is also performed.

National Poison Control Centre consists of:

- **Clinic for Emergency and Clinical Toxicology**
- **Institute for Toxicology and Pharmacology**

A detailed overview of the organizational structure of the NPCC MMA is shown in Figure 2.

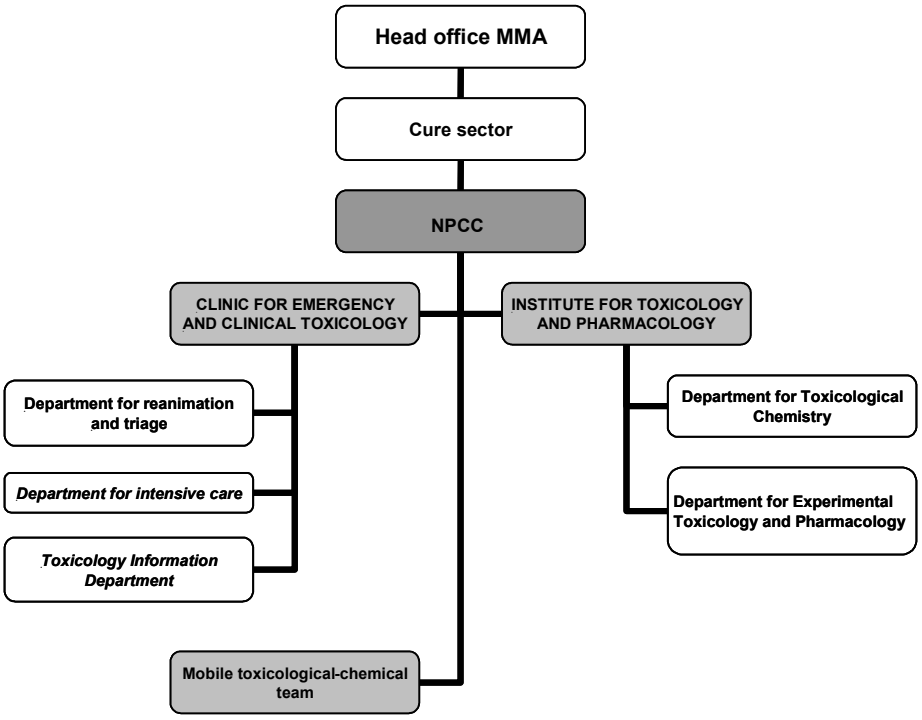


Figure 2 - Organizational structure of NPCC MMA

Clinic for Emergency and Clinical toxicology

The Clinic for Emergency and Clinical toxicology, the only specialized clinical institution for acute poisoning treatment in the country, consists of:

- *Department for reanimation and triage*
- *Department for intensive care*
- *Toxicology Information Department*

Working time of the Clinic is 24 hours, 7 days a week. Clinic`s capacity consists of 24 beds with the possibility of increasing the number of patients, if necessary. At the Clinic, patients with acute medicaments, pesticides, corrosives, gases, mushrooms, industrial chemicals and other toxic agents poisonings are treated. The clinic is also responsible for the definitely hospital care and management of acutely poisoned patients in mass chemical accidents. Diagnostic and management of acutely poisoned patients is performed according to clearly formulated protocols, which are in full compliance with the protocols of toxicological centres in the world.

In the previous five-year period, the average annual number of hospitalizations at the Clinic amounted to about 720, with a gradual decline in this number, due to the large scale of definitive treatment at the DRT.

At the Clinic for Emergency and Clinical Toxicology, undergraduate studies (elective course „Clinical toxicology“, Faculty of Medicine of MMA) and postgraduate education within subspecialisation of clinical toxicology are performed.

Department for reanimation and triage

Department for reanimation and triage (DRT), popularly called the Toxicology Ambulance, is located in the Emergency Centre of the Military Medical Academy.

The Department has 6 standard beds intended for the accommodation of patients for outpatient observation. The Department is equipped with 4 vital signs monitors, ECG, defibrillator, aspirator, portable respirator and other necessary equipment, medical supplies and medications. At the DRT medical technicians and clinical toxicologist, are constantly on duty, 24 hours a day performing activities of admission, diagnosis and treatment of patients referred to the Center for Poison Control MMA. Such material and technical equipment, as well as staff training, allow adequate implementation of a number of urgent medical procedures, including procedures of cardiopulmonary resuscitation (CPR).

In the last decade, the annual average number of medical examinations in DRT was around 4200, and in the last 5 years, a trend of steady increase was noted (2012-4176; 2013-4199; 2014-4413; 2015-4747), until this year's 4584.

Pictures 2 and 3 - Department for reanimation and triage

At the DRT, because of suspicion of acute poisoning, patients are usually transported by car to the emergency service, from public places as well as the different levels of health facilities from the territory of the Republic of Serbia and the region, primarily in the Republic of Srpska. A number of them, come directly into personal arrangement, without any prior contact with health services. In all these cases, the first examination is performed timely, as well as appropriate diagnostic and therapy.

If mild poisoning occures or in the cases of the exclusion of acute intoxication, (about 85% of the total), at the DRT, after completion of diagnostic and therapeutic protocols and observations, definitive medical treatment will be finished in 6, rarely 12 hours. In about 15% of cases, hospitalization in the Clinic for Emergency and Clinical Toxicology, was indicated, due to severe or moderately severe clinical picture of intoxication.

At the DRT, patients are sent for the toxicological examination without any positive toxicological history, with severely impaired state of health, when rapid differential diagnosis is necessary, to prove or exclude toxicological etiology. Therefore, consultative reviews of other specialists such as ORL, gastroenterologist (endoscopy), neurologists, neurosurgeons, psychiatrists and others are necessary. In that manner in a certain number of cases, toxicological etiology is excluded, other nontoxicological disease is proved, for which patients are sent to other services within or outside VMA, for definitive medical care.

Department for intensive care

Department for intensive care is intended for treatment of patients with moderate to severe acute poisoning, who require medical treatment level of intensive care units.

Out of 24 beds in the Clinic for Emergency and Clinical Toxicology, 8 are in the Department for intensive care, but if necessary all capacities can be activated for intensive treatment and care of patients.

These standard 8 bed positions are equipped with vital functions monitors associated with the central control unit, with the additional possibility of using portable pulse oximeters.

Pictures 4 and 5 - Patients Care in the Intensive Care Department

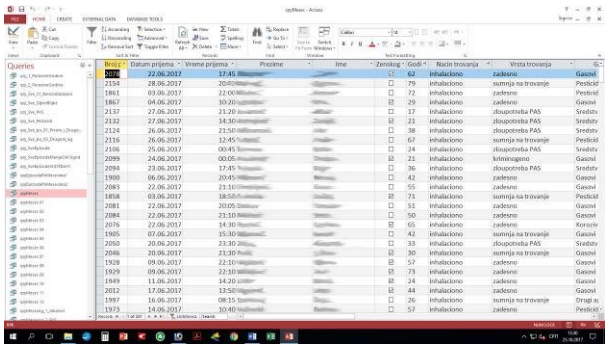
Constantly available devices for mechanical ventilation, aspirators, defibrillators, EKG, enable the implementation of all necessary emergency diagnostic and therapeutic procedures, including those in the context of cardiopulmonary resuscitation.Spatial and technical conditions, permit the uninterrupted performance of "bedside" additional non-invasive and invasive examinations and interventions, such as echosonography, ORL examination, endoscopy, paracentesis with possible drainage and other procedures.

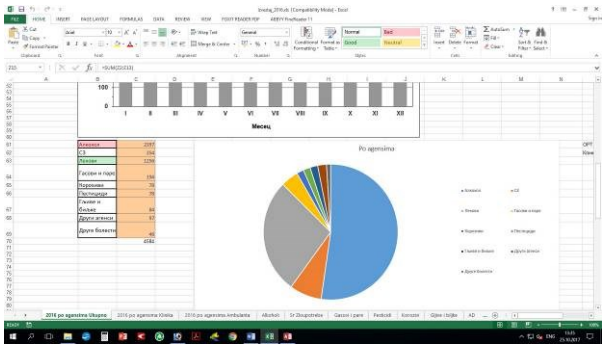
Within the Clinic, there is a blood gas analyzer, used, if necessary for diagnostics of gas and acid-base status in patients stationed in other units of the MMA, during the non-working hours, weekends and holidays.

Toxicology Information Department

The Section is equipped with "online" computer data-base made by the Sector staff, which contains information about:

- Toxic substances and preparations on the market
- Manufacturers and distributors of chemical substances including places of manufacture and storage in the Republic of Serbia
- Cases of acute self-poisoning, occupational and accidental poisoning, which are registered in the Republic of Serbia, presented to the Centre for a one-year period.





Pictures 6 and 7 - Database and statistical data processing in the Toxicology Information Department

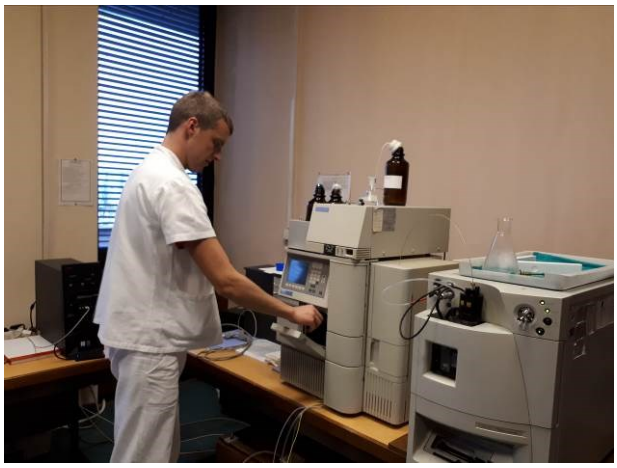
Institute for Toxicology and Pharmacology

The Institute covers numerous preclinical and clinical areas of toxicology and pharmacology which are important in solving toxicological problems in clinical practice.
The Institute consists of two organizational units:

- *Department for toxicological chemistry*
- *Department for experimental toxicology and pharmacology*

Department for Toxicological Chemistry

The main task of the Department for Toxicological Chemistry is performing toxicological-chemical analyses, aiming rapid, sensitive and reliable detection, identification and quantification of toxic agents in different types of samples (biological material, air, water, soil, food, general use products, industrial products, etc.).
Urgent toxicological-chemical analysis of biological samples of patients admitted for treatment at the Clinic for Emergency and Clinical Toxicology of MMA are of particular importance.
Department for Toxicological Chemistry provides services under the urgent toxicological-chemistry service duty, 24 hours a day. In the case of chemical accidents, the Department participates in the reconnaissance and analytical tasks of Mobile toxicological-chemical team.
Laboratory equipment allows the application of the following analytical methods: physicochemical, chemical, immunochemical, enzymatic, chromatographic (HPLC, GC, UPLC) and spectrometric (UV, VIS, ICP MS).

Pictures 8 and 9 - Perform toxicological analyzes at the Department of Toxicological Chemistry

Department for Experimental Toxicology and Pharmacology

Human resources and equipment of the Department, enable testing of certain pharmacodynamic and toxicodynamic effects of medicaments or poisons in experimental animals. In cooperation with other organizational units of the Institute for toxicology and pharmacology of MMA, as well as, clinics and institutes of MMA, the production of complex preclinical projects is possible.

Structure of human resources potential of NPCC is shown in Table 1.

Table 1 - The Personnel structure NPCC of MMA

Groups	n	%
Doctors	11	16.4
Medical technicians	24	35.8
Specialists of toxicological chemistry	9	13.4
Veterinarians, biologists	4	6.0
Laboratory technicians	11	16.4
Administrative staff	3	4.5
Support staff	5	7.5
Total	67	100.0

In the event of increased needs of individual organisational units of the NPCC, the necessary personnel are temporarily engaged.

Mobile toxicological-chemical team

Mobile toxicological-chemical team (MTC) is not an independent organisational unit; it consists of the personnel from all PCC organizational units. MTC team is activated in the case of larger chemical accidents, with the primary task of implementing medical procedures at the scene, in coordination with other relevant departments.

In order to realise these basic purposes, the MTE is equipped and trained to implement a number of activities, among which the most important are:

- Sampling, detection, identification and quantification of chemicals in water, land, air, as well as in biological materials in the field;
- First aid and emergency treatment in field conditions at the location of chemical accidents;
- Organization of medical aspects of triage, evacuation, care and treatment of poisoned victims;
- Consultations about hospital treatment of patients from chemical accidents, admitted to the regional health institution;
- Implementation of specific and nonspecific therapy of poisoned patients during transport to PCC (severe poisoning cases).

Regular activities of members of the Mobile toxicological team that are planned and carried out during the year, are in the function of the preparation and training for the above tasks. These include participation in training courses, demonstration exercises and control activities related to highly toxic chemicals. These activities are carried out by members of the MTE in cooperation with other departments of the Ministry of Defence (MD) and the Serbian Armed Forces (SAF), some civil structures such as the Ministry of Internal Affairs of the Republic of Serbia (MIA RS). In this context, of great importance is a perennial and very meaningful international cooperation, especially with the Organization for the Prohibition of Chemical Weapons (OPCW), whose administrative headquarters is in The Hague.

RESULTS

Basic (incomplete) data on the number of registered cases of poisoning and their frequency in relation to the total number of inhabitants of Republic of Serbia is shown in Table 2. The number of registered cases of poisoning, shown in the table, represents the total number of acute poisoning in the Republic of Serbia based on the data registered in the NPCC (4584) and the available data from 16 regional health care centers in Republic of Serbia (2265).

Table 2 - Population in the Republic of Serbia and the number of registered poisoning in 2016

Year	Number of inhabitants	Number of registered cases	Number of cases per 1.000 inhabitants
2016.*	7 040 272	6849	0.97

*Available data, web site of the Republic Institute for Statistics, Statistical Annual Report of Serbia, July, 2017.

Toxicology Information Department

During 2016 in the Toxicology Information Department numerous calls from citizens and medical workers of different profiles are registered. The structure of the calls, in relation to the presumed cause of poisoning is shown in Table 3.

Table 3 - Structure of the calls (intoxications of adults and children)

Agents	Adults		Children	
	Calls from the doctors	Calls from the citizens	Calls from the pediatrician	Calls from the citizens
Medicaments	124	17	114	30
Pesticides	91	16	28	4
Corrosives	40	10	36	5
Mushroom and plants	14	4	18	10
Gases	22	15	5	1
Alcohol	7	3	7	3
Drugs of abuse	11	5	3	1
Other	19	30	50	1
Total	328	100	261	55

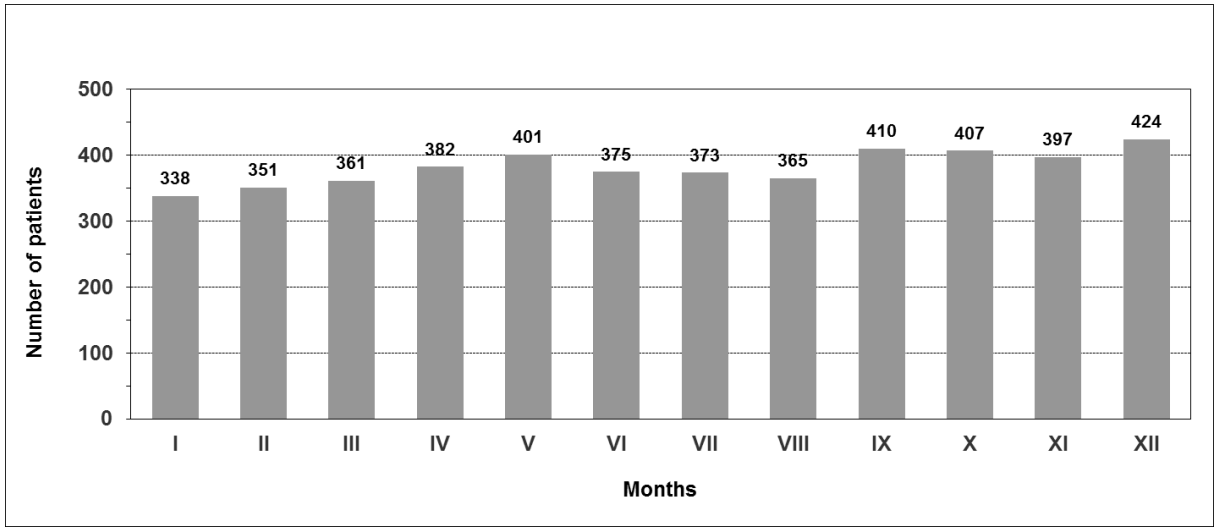
In a one-year period a total of 744 calls were received, 428 calls were related to the presumed poisoning in adults, and 316 in children. Calls from citizens were relatively less represented (115; 20.8% of the total) in relation to the number of received calls from the doctors. In both cases medicaments as a possible etiologic agents predominate and the character of intentions are suspected as accidental intoxication, especially in children.

Department for Reanimation and Triage of the Clinic for Emergency and Clinical Toxicology

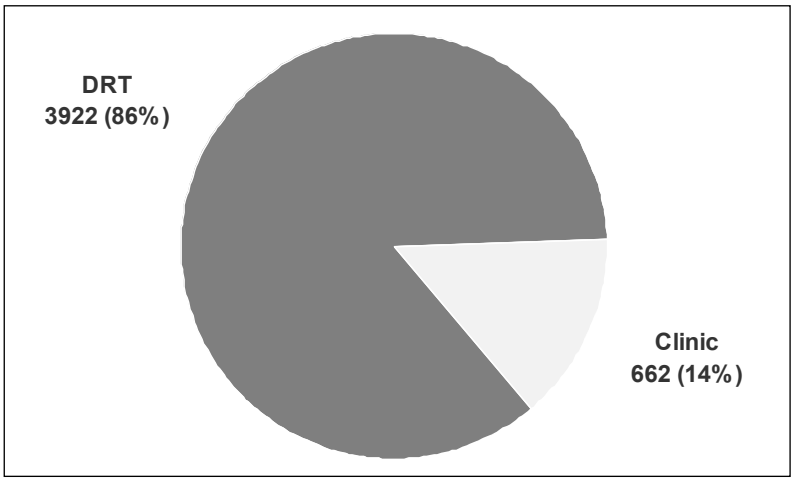
During 2016, in the Department for reanimation and triage of NPCC a total of 4584 patients were examined by a physician, and 662 (14.4%) of them were admitted for hospital treatment in the Clinic for Emergency and Clinical toxicology.

The specified number of outpatient medical examinations, as noted in the introductory section of this Yearbook, confirms the long-term tendency of increasing the volume of activity in the DRT NPCC. As an illustration, data from 2010 can be cited whwn the number was 3996, than in 2012 – 4176 and in 2014 – 4415 patients.

Distribution of patients examined by months, is shown in Graph 1, and the relationship of examined (discharged to home) and hospitalized patients in the Graph 2.

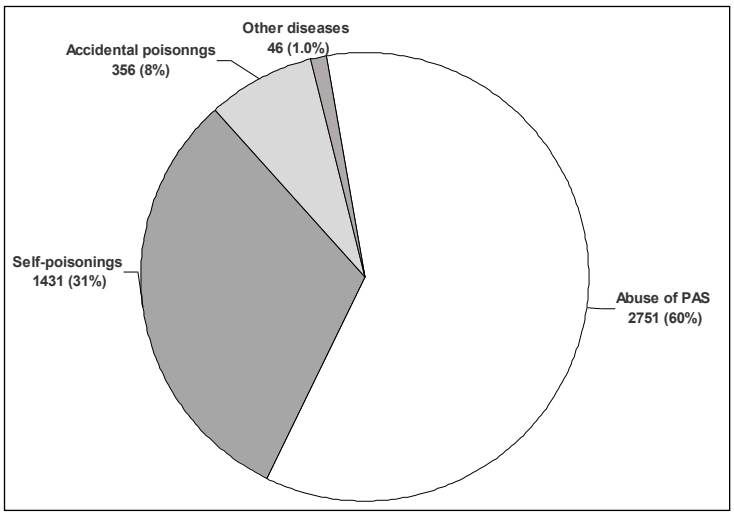


Graph 1 - Total Number of patients examined in DRT, by months



Graph 2 - Number and percentage of examined outpatient definitely care of and hospitalized patients

The most common reason for arriving at the DRT was the suspicion of psychoactive substances abuse – PAS (alcohol and drugs of abuse) and self-poisoning by medicaments, corrosive agents and pesticides (over 90% of all cases). A less common reason for arriving was accidental exposure and intoxication (Graph 3).



Graph 3 - Basic Distribution of reasons to arriving DRT on intentions characters

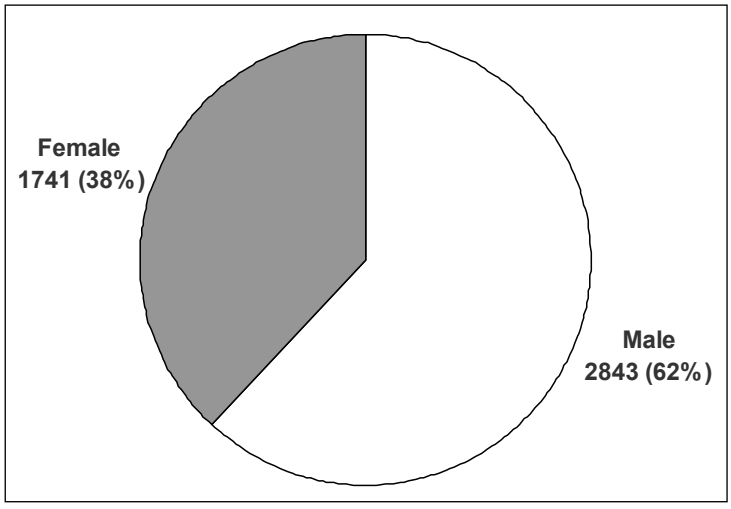
The most common causes for observatioan and treatment in the DRT NPCC were alcohols with 2397 examinations in total, 52.3% of the total number of examinations. Of this number, there were 5 cases of poisoning with ethylene glycol and methyl alcohol. Agents that followed were medicaments with 1256 examination (27.4%), substances of abuse - 354 patients (7.7%), gases – 194 patients (4.2%), mushrooms and plants in 84 patients (1.8%), corrosives – 78 patients (1.7%), pesticides – 78 patients (1.7%), other agents in 97 patients (2.1 %). In 46 patients were without acute exposure and intoxication (1%), Table 4.

Table 4 - The frequency of the dominant causes of piosoning in examined outpatient and hospitalized patients and the distribution of agents in hospitalized patients in relation to single agent

Dominant cause	DRT	Clinic	
	n	n	%
Alcohols	2397	9	0.4
Drug of abuse	354	32	9.0
Medicaments	1256	477	38.0
Psychoactive	1008	392	38.9
Other drug	248	85	34.3
Gases	194	17	8.8
Corrosive	78	57	73.1
Pesticides	78	26	33.3
Mushrooms and plants	84	19	22.6
Other agents	97	6	6.2
Other diseases	46	19	41.3
Total	4584	662	

From Table 4 (right column), we may conclude the following: analyzed by etiological groups, the highest percentage of indications for hospitalization in relation to the number of examination in the DRT NPCC, registered in corrosive compounds, followed by drugs, pesticides, mushroom (plants). It also suggests that these groups of toxic agents usually cause a clinical picture that required hospitalization of patients. In contrast, a large discrepancy between the number of outpatient examination on one side, and a small percentage of admissions from the other (0.4% and 9.0%) was noted in patients with alcohol and substance of abuse.

Of the total number of examined patients, there were 2843 (62%) males and 1741 (38%) females (Graph 4).



Graph 4 - Distribution of patients by gender (DRT NPCC)

The majority of examined patients, 1927 of them, were in the 19-40 years group (42%), followed by 1698 (37%) in the range of 41-65 years. These two age groups (together as much as 79%) belong to working population (Table 5).

Table 5 - Distribution of patients by age (total examination number at the DRT NPCC)

Age groups (years)	n	%
To 18	433	9.5
19 - 40	1927	42.0
41 - 65	1698	37.0
More than 65	461	10.1
Unknown	65	1.4
Total	4584	100.0

Poisonings are ranked by severity based on PSS (Poisoning Severity Score), shown in Table 6 with results relating to outpatient, non-hospitalized patients.

Table 6 - Poisoning severity expressed by PSS (definitely care of at the DRT NPCC)

Poisoning severity	N	%
PSS 0	651	16.6
PSS 1	2379	60.7
PSS 2	387	9.9
PSS 3	89	2.3
PSS 4	2	0.05
Other	414	10.5
Total	3922	100.0

Without any clinically significant signs of poisoning (PSS 0) were 651 (16.6%) people. This data from the table, shows a large number of patients who had anamnestic suspicion of acute poisoning, which was not proven by clinical and additional outpatient diagnostics. The most important reasons for this, lies in the unjustifiably frequent bypassing medical services of primary and secondary rank by patients (accompanied or alone, patients come directly to PCC MMA which is a tertiary institution). This often happens after a phone call to the public emergency services for advise, without prior medical examination, and without consulting a toxicologist who is available on phone (**+381 11 36 08 440**), **24 h daily**.

Mild poisoning (PSS 1) was registered in 2379 (60.7%) of the total examined and treated patients, moderate (PSS 2) in 387 (9.9%) patients, and severe poisoning in (PSS 3) in 89 (2.3%) patients. Lethal outcome (PSS 4) was registered in 2 cases (0.05%).

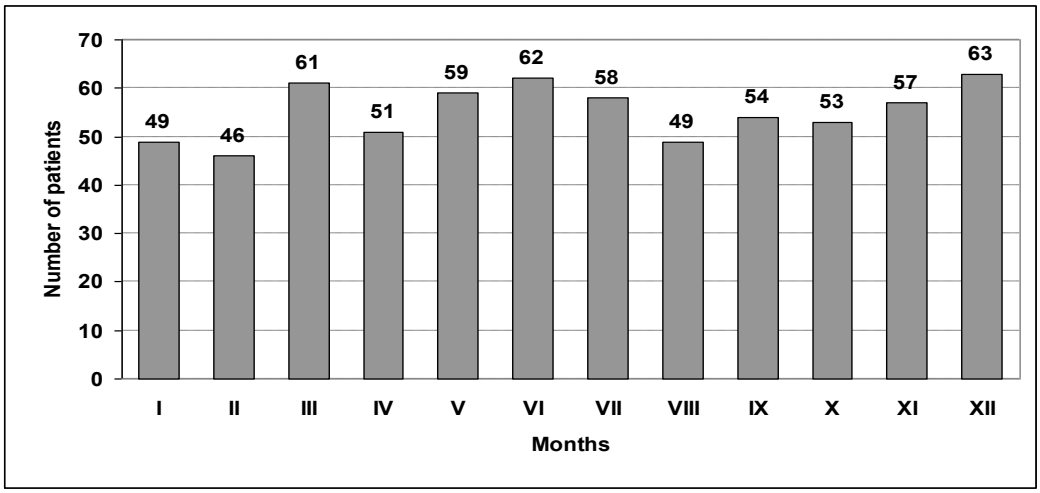
The first one was severe poisoning with cardiologic drugs (verapamil) and psychoactive drugs (chlorpromazine and bromazepam), while in the second case was a serious intoxication with ethyl alcohol. In both cases, respiratory and cardiocirculatory insufficiency was initially registered, and the resuscitation procedure was carried out in DRT but without success.

In 414 patients (10.5 %) no exposure to toxic agents was present. The statement about it often requires not only safe exclusion of acute poisoning, but also in no small number of cases, diagnosis or reasonable suspicion of others nontoxicological diseases or conditions.

Clinic for Emergency and Clinical toxicology

In the Clinic for emergency and clinical toxicology 662 patients were hospitalized.

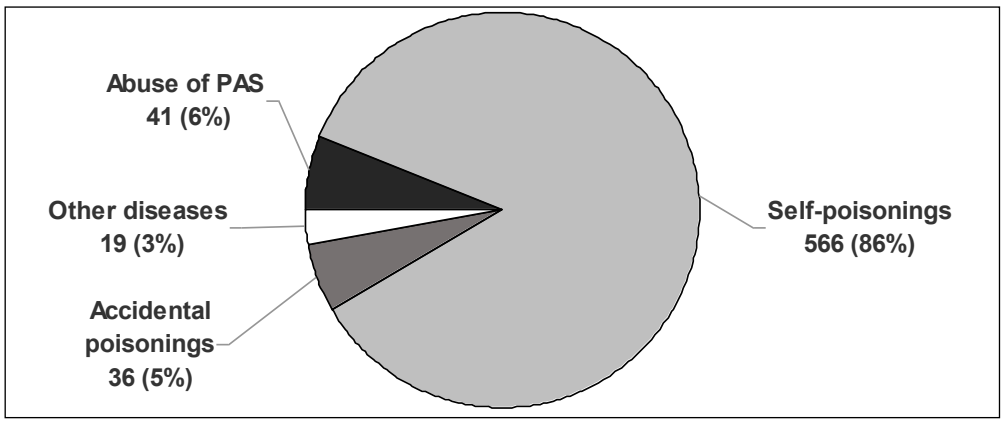
Time dynamics (by months) of admissions to the Clinic for Emergency and Clinical Toxicology shown in the Graph 5.



Graph 5 - The number of hospitalized patients in the Clinic for emergency and clinical toxicology, by months

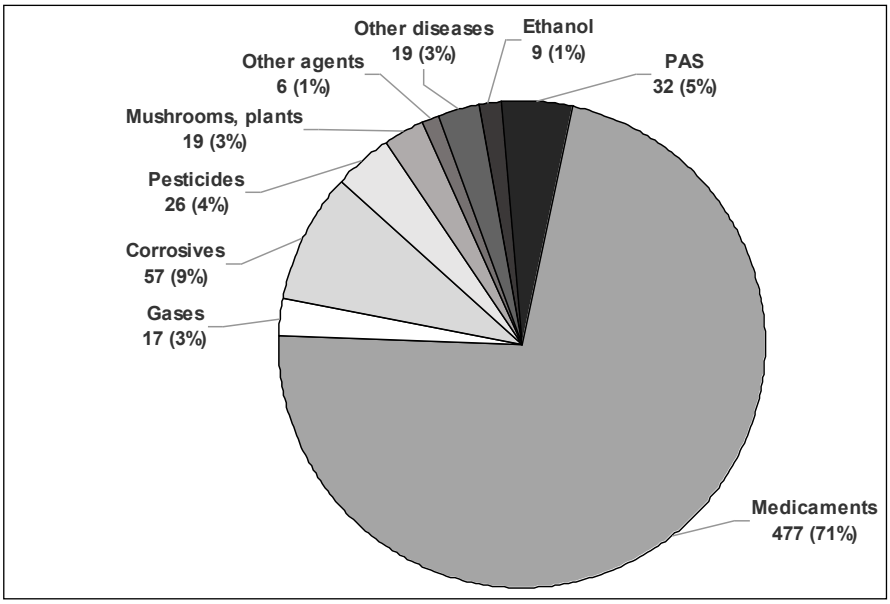
In the previous section, it has already been pointed out, that this number of hospitalized patients, represents 14.4% of the total number of people examined at the DRT and that percentage continues the long-term decrease trend: in 2010 it amounted to 20.5% and in 2014 to 16%. This is undoubtedly one of the indicators of increasing the efficiency and quality of work at the Centre and in full compliance with current intentions of the organization of health services in the developed world.

The most common reason for hospitalization was self-poisoning by medicaments, corrosive substances and pesticides (566 in total; 85.5 % cases). On the other side, psychoactive substances of abuse - PAS (alcohol and narcotics) as well as accidental poisoning appeared in only 41 ie 36 patients respectively (by 6.2%, ie 5.4% for each group), as shown in the Graph 6.



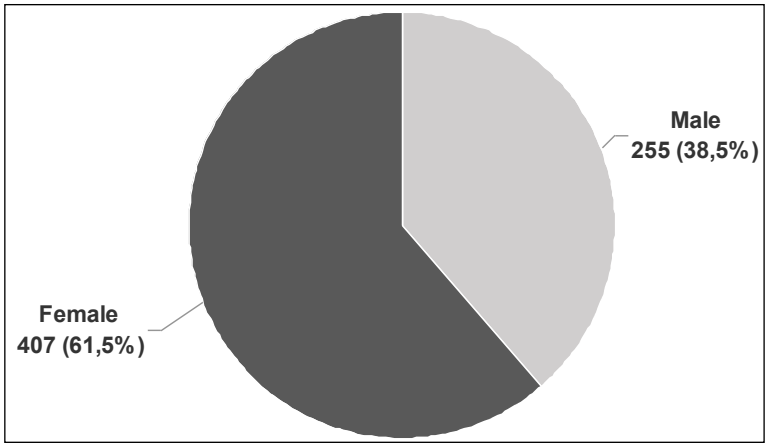
Graph 6 - Reason for hospitalization of patients (Clinic for emergency and clinical toxicology)

Medicaments, as a dominant cause of poisoning were the most common agents, in 477 patients (72.1% of hospitalized patients), followed by corrosives in 57 cases (8.6%), substances of abuse in 32 patients (4.8%), pesticides with 26 poisonings (3.9%), mushrooms and plants in 19 (2.9%), gases in 17 (2.6%), ethanol and other toxic alcochols in 9 patients (1.4%), other toxic agens in 6 (0.9%), and other diseases were noted in 19 patients (2.9%), Graph 7.



Graph 7 - The percentage distribution of causes of poisoning (Clinic for emergency and clinical toxicology)

According to gender, 255 (38.5%) males and 407 (61.5%) females were hospitalized, Graph 8.



Graph 8 - Distribution of patients by gender (Clinic for emergency and clinical toxicology)

According to the age structure of hospitalized patients, there were 41 (6.2%) persons younger than 18 years, from 19-65 years 496 patients (74.9%), and 125 patients (18.9%) were older than 65 years (Table 7).

Table 7 - Distribution of patients according to age (Clinic for emergency and clinical toxicology)

Age groups (years)	n	%
To 18	41	6.2
19 - 40	240	36.2
41- 65	256	38.7
More than 65	125	18.9
Total	662	100.0

Analysis of the severity of poisoning, of the people treated in our hospital, showed, that no clinically significant signs of poisoning (PSS 0) were present in 32 people (4.8%). Namely, in cases of suspected poisoning with some types of agents, which is characterized by late or delayed manifestation of clinical symptoms of intoxication, the time necessary for an adequate toxicological diagnosis, significantly exceeds the optimal time of outpatient observation. As an example of this, exposure to certain pesticides-rodenticides, mushrooms, some types of medicaments (eg. Lithium), unknown potential corrosive substances and some other substances are given. For these reasons, hospital observation and further diagnostic tests, which usually last up to 48 hours after exposure, are indicated and implemented. The above data, shows the frequency of those cases where acute poisoning has not been proven, despite positive or suspected history.

Table 8 - Severity of poisoning expressed by PSS (Clinic for emergency and clinical toxicology)

Poisoning severity	n	%
PSS 0	32	4.8
PSS 1	288	43.5
PSS 2	127	19.2
PSS 3	162	24.5
PSS 4	26	3.9
Other	27*	4.1*
Total	662	100.0

Mild poisoning (PSS 1) was registered in 288 (43.5%) patients, moderate in 127 (19.2%), severe poisoning (PSS 3) in 162 (24.5%), and there were 26 (3.9%) cases with lethal outcome.

Because of other nontoxicological diseases* (Table 8), 27 patients were treated at the clinic (4.1%). Out of these 27 patients, 4 died.

In the current review only the basic data about the number, gender and age structure of patients and the distribution of different types of poisoning in examined and hospitalized patients are given. In the further text, using similar methodology, the data will be analyzed in relation to the type of chemical agent that caused the intoxication.

Alcohols

The most common agent due to which patients arrived at the **DRT PCC** was ethyl alcohol. Due to the acute ethyl alcohol intoxication 2392 people were examined (52.2% of all examined). A significantly higher number of males 1842 (77.0%), compared with females 550 (23.0%), was registered. Most were represented patients aged 19-40 years, of whom there were 980 (39.7%); followed by patients in the age range of 41-65 years 974; (40.7%). Patients aged over 65 years made up 131 (5.5%). Significantly, 12.1% (290 patients) were minors.

Mild acute ethyl alcohol intoxication (PSS 1) was registered in 1773 (74.1%) patients, 365 examined patients (15.3%) were with signs of moderate and severe acute intoxication (PSS 2 - 296 and PSS 3 – 69). In 156 (6.5%) people PSS 0 was registered. A total of 93 patients (3.9%) was mistakenly sent due to suspicion of ethyl alcohol intoxication, which were rejected with appropriate diagnostic procedures, and one (1) patient died (PSS 4 - 0.04%) immediately after receiving at the DRT. We either proved that another toxicological ethiology was present or that a completely non – toxicological condition was present in a significant number of patients.

Due to the acute ethyl alcohol intoxication 4 patients (0.6% of all hospitalized patients) were admitted to **Clinic for emergency and clinical toxicology**, 3 (0.4%) intoxications were caused by methyl alcohol and 2 (0.3%) by ethylene glycol, of that number male was in 7 patients (77.8%), and female 2 (22.2%), up to 18 years old 1 patient, 19 to 65 years 6 patients (working-age 66.7%), and over 65 years 2 patients. In 3 patients, easy poisoning was reported (PSS 0 and PSS 1), PSS 3 was registered in 5 patients, and 1 letal outcome (PSS 4) was caused by poisoning with ethylene glycol.

Medicaments

At the **DRT NPCC** 1256 patients were examined due to the acute medicaments intoxication, which is 27.4% of all examined patients.

Due to the acute psychoactive drug intoxication 1008 (80.2%) patients, out of them 312 males (31.0%) and 696 (69.0%) females, were examined. According to the type of causes, as expected benzodiazepines were dominate (649; 64.4%), then antiepileptics with 171 cases (17.0%)

Neuroleptics in 137 patients (13.6%) and antidepressants in 21 patients (5.0%) were registered as a cause of poisoning.

In the group of benzodiazepines, the most common cause of poisoning was bromazepam in 328 cases (50.5%), then diazepam 151 cases (23.3%) and lorazepam 77 cases; (11.9%).

Among the antiepileptics, significantly more frequent in comparison to other was carbamazepine, in 71 (41.5%) patients and clonazepam in 62 (36.3%) patients, then VPA in 22 (12.9%), lamotrigine in 9 (5.3%) and barbiturates in 5 (2.9%) patients.
In the group of neuroleptics, clozapine, olanzapine and risperidone were the predominant cause of poisoning in 81 (59.1%) patients, followed by phenothiazines 21 patients (15.3%) and butyryphenones 14 (10.2%).
In the group of antidepressants, the new-generation antidepressants (SSRI) (29 patients; 56.8%), compared to cyclic antidepressants (12 patients; 23.5%) were a bit more frequent, as the cause of poisoning. Detailed review of number of acute drug poisonings in DRT NPCC was shown in Table 9.
According to age, minors were 79 (7.8%), 829 people (82.2%) were aged 19-65 years and 100 patients older than 65 years (9.9%).
Even with 270 people (26.8%) anamnestic suspicion of intoxication (PSS 0) had not been proven, while mild poisoning (PSS 1) was found in 489 people (48.5%). Moderate poisoning (PSS 2) was registered in 101 (10.0%), and severe poisoning (PSS 3) in 104 patients (10.3%). Forty four patients (44%) were mistakenly sent, due to the suspicion on the acute drug intoxication, which has not been confirmed.

Among the medicaments from other groups, which were the predominant cause of poisoning in 248 examined patients, the most common were analgesics which were the primary agent in 76 (30.6%) patients. NSAID was the cause of poisoning in 48 cases, and opioid analgesics in 28 cases. The predominant cause of poisoning in 75 (30.2%) patients was cardiovascular drugs. Among these group of medicaments as the cause of poisoning, the most common were beta blockers (32 cases), calcium antagonists (19 cases) and ACE inhibitors (17 cases). Sympathomimetic drug poisoning (theophylline and other) was registered in 8 (3.2%), and anticholinergic drug poisoning in 4 (1.6%) patients. Poisonings by other drugs (oral hypoglycemic drugs, hormonal preparations, unknown drugs, etc.) were recorded in 85 (34.3%) patients.
A score of PSS 0 was present in 66 patients (26.6%), signs of mild poisoning (PSS 1) were found in 94 (37.9%) patients, moderate poisoning (PSS 2) in 16 (6.5%) of them, severe poisoning (PSS 3) in 22 (8.9%) patients and one (1; 0.4%) died (PSS 4). Forty- nine patients (19.7%) were mistakenly sent because of suspected acute intoxication of drugs, since it has not been proven.

Table 9 - The frequency of a single drug as dominant cause of poisoning (DRT NPCC)

Psychoactive drug	1008	%	**Other drug**	248	%
Antidepressants			*Analgesics*		
Cyclic	12	23.5	NSAID	48	63.2
SSRI	29	56.9	Opioides	28	36.8
Others	10	19.6	Total	76	100.0
Total	51	100.0			
			Cardiological		
Antiepileptics			Beta blockers	32	42.7
Carbamazepine	71	41.5	Calcium antagonists	19	25.3
Clonazepam	62	36.2	ACE inhibitors	17	22.7
VPA	22	12.9	Nitrates	3	4.0
Lamotrigine	9	5.3	Cardiotonics	1	1.3
Barbiturates	5	2.9	Other cardiological	3	4.0
Other antiepileptics	2	1.2	Total	75	100.0
Total	171	100.0	*Sympathomimetics*		
			Theophylline	6	75.0
Benzodiazepines			Others	2	25.0
Bromazepam	328	50.5	Total	8	100.0
Diazepam	151	23.2	*Anticholinergics*		
Lorazepam	77	11.9	Biperiden	4	100.0
Alprazolam	65	10.0	Others	0	0.0
Midazolam	7	11.1	Total	4	100.0
Nitrazepam	3	0.5	Others		
Zolpidem[1]	18	2.8	Oral hypoglycemics, hormonal preparations, unknown drugs etc.		
Total	649	100.0			
Neuroleptics					
Phenothiazines	21	15.3			
Butyrophenones	14	10.2			
Clozapine	46	33.6			
Olanzapine	24	17.5	Total	85	100.0
Risperidone	11	8.0	[1] anxiolytic, does not belong to the group of benzodiazepines		
Others neuroleptics	21	15.3			
Total	137	100.0			

From the total of 662 **hospitalized patients**, 477 people (72.0%) were treated due to acute medicaments intoxication. Among them, 392 people (82.2%) were hospitalized due to acute psychoactive drug poisoning, and 85 people (17.8%) due to acute other drug group poisoning.

In the group of patients with acute psychoactive drug poisoning there were 271 females (69.1%) and 121 males (30.9%). Minors were 23 (5.8%), those at the age of 19-65 years 308 (78.6%) and older than 65 years 61 people (15.6%).

The most common medicaments, as a cause of poisoning, were from the benzodiazepine group 193 persons (49.2%), neuroleptics 90 (23.0%), antiepileptics 89 (22.7%) and antidepressants 20 (5.1%).
In the group of benzodizepines, the leading cause of poisoning was bromazepam (106 cases), followed by a significantly smaller number of diazepam (29), lorazepam (26), alprazolam (21), zolpidem (9), nitrazepam (2).

Among the neuroleptics, the most common cause were clozapine (33 cases), olanzapine (22 cases) and phenothiazines (13), risperidon (5) and ziprasidon (4).

Among the antiepileptics, the most common cause of poisoning was carbamazepine (53 cases), followed by VPA (17), clonazepame (8), lamotrigine (6) and barbiturates (5).

Among antidepressants, as the cause of poisoning, SSRI (13 cases) and cyclic antidepressants (7) were represented.

Detailed review of the number of acute medicament intoxication at the Clinic for emergency and clinical toxicology is shown in Table 10.

Among the patients hospitalized due to acute psychoactive drug poisoning, 8 patients with a score PSS 0 (2.0%) were noted, mild poisoning (PSS 1) in 195 people (49.8%), moderate (PSS 2) in 87 people (22.2%), and severe (PSS 3) in 94 people (24.0%). In this group of patients, 8 lethal outcomes (PSS 4; 2.0%) were registered, the dominant causative agents in 4 cases were antiepileptics, benzodiazepines in 3 and antiepileptics in 1 case.

Due to the acute poisoning by other medicaments, 85 patients, 29 males (34.1%) and 56 females (65.9%), majority of them at the age of 19-65 years old 53 patients (62.4%) were hospitalized. Minors were 11 (12.9%) and older than 65 years 21 (24.7%).
The most common cause of poisoning were cardiovascular drugs. Forty-eight cases of acute poisoning (56.5 %) were registered, and beta blockers (22 cases), calcium antagonists (14) and ACE inhibitors (8) were dominant. In the group of analgesics (19 cases), NSAID poisonings were predominant (15 cases).

There were 5 patients with acute sympathomimetics poisoning, and 4 of them were acute theophylline poisoning.
There were no patients hospitalised at the Clinic in 2016 due to acute anticholinergics intoxication.
Other drug poisoning (oral hypoglycemic drugs, antilipemics, unknown drugs, etc.) was registered in 13 patients (15.3%).

In hospitalized patients of this group in 6 patients (7.0%) was registered with a PSS score of 0, clinical picture of mild poisoning (PSS 1) in 47 patients (55.3 %). Moderate intoxication (PSS 2) in 11 patients (12.9%), severe poisoning (PSS 3) in 17 patients (20.0%). Four lethal outcome (PSS 4) was registered, in patients intoxicated by cardiac drugs (2) and other medicaments (2).

Table 10 - The frequency of a single drug as a dominant cause of poisoning (Clinic for emergency and clinical toxicology)

Psychoactive drug	392	**%**	**Other drug**	85	**%**
Antidepressants			*Analgesics*		
Cyclic	7	35.0	NSAID	15	78.9
SSRI	13	65.0	Opioides	4	21.1
Others	0	0.0	Total	19	100.0
Total		100.0	*Cardiological*		
Antiepileptics			Beta blockers	22	45.8
Carbamazepine	53	59.6	Calcium antagonists	14	29.2
VPA	17	19.1	ACE inhibitors	8	16.7
Clonazepam	8	9.0	Nitrates	3	6.2
Lamotrigine	6	6.7	Cardiotonics	1	2.1
Barbiturates	5	5.6	Total	48	100.0
Others	0	0.0			
Total	89	100.0	*Sympathomimetics*		
Benzodiazepines			Theophylline	4	80.0
Bromazepam	106	54.9	Others	1	20.0
Diazepam	29	15.0	Total	5	100.0
Lorazepam	26	13.5	*Anticholinergics*		
Alprazolam	21	10.9	Trihexyphenidyl	0	0.0
Nitrazepam	2	1.0	Biperiden	0	0.0
Zolpidem[1]	9	4.7	Total	0	0.0
Total	193	100.0	Others		
Neuroleptics			Oral hypoglycemics, hormonal preparations, anticoagulants, etc.		
Phenothiazines	13	14.4			
Butirophenoni	3	3.3			
Clozapine	33	36.7			
Olanzapine	22	24.4			
Risperidon	5	5.6	Total	13	100.0
Others	14	15.6	[1] anxiolytic, does not belong to the group of benzodiazepines		
Total	90	100.0			

Drugs of abuse

In the **DRT PCC** 354 patients (7.7% of all examined) were examined for suspicion of acute drug abuse intoxication. According to gender, there were 268 males (75.7%) and 86 females (24.3%). In relation to the age groups, under the age of 18 years were 38 people (10.7%), in the age of 19 to 40 years 274 people (77.4%) and in the age between 41-65 years 39 people (11.8%). One (1) patient was older then 65, in two (2) person age was not registered.
Acute intoxication has not been proven (PSS 0) in 51 patients (14.4%), mild poisoning had 162 people (45.8%), 71 patients (20.0%) were with signs of moderate poisoning, and in 31 people (8.8%). One patient (1) died (PSS 4) and suspicion on the underlying intoxication was not confirmed for 38 patients (10.8%).

Under suspicion of heroin abuse, 178 people (50.3% of total PAS) were examined. According to the age groups, at the age 15-19 were 6 people (3.4%), 20-24 years 17 people (9.5%), 25-29 years were 29 people (16.3%), 30-65 years old 126 people (70.8%). A score of PSS 0 was registered in 16 (9.0%). In 71 patients had mild poisoning (39.9%), 53 patients (29.8%) were with signs of moderate poisoning, and in 28 people (15.7%) severe poisoning was confirmed. Suspicion on the underlying heroin intoxication was not confirmed for 10 patients (5.6%).

Under suspicion on the marijuana abuse 78 people were examined (22.0% of all PAS). According to the age groups, 2 people younger than 14 years (2.6%) were registered, at the age 15-19 there were 25 people (32.0%), 20-24 years old 23 people (29.5%), 25-29 years old 12 people (15.4%), 30-65 years old 16 people (20.5%). In 15 patients (19.2%) was determined PSS score of 0, mild poisoning had 45 patients (57.7%), and 7 patient (9.0%) were with the signs of moderate poisoning. Suspicion on the underlying marijuana intoxication was not confirmed for 11 patients (14.1%).

Under suspicion of cocaine intoxication 20 people (5.6% of total PAS) were examined. According to the age groups, at the age 20-24 years old 5 people (25.0%), 25-29 years old 4 people (20.0%), 30-65 years old 11 people (55.0%). The PSS 0 score was established in 1 people (5.0%), 13 patients had mild poisoning (65.0%), 3 patients (15.0%) were with the signs of moderate and 3 patient (15.0%) was found with signs of severe poisoning.

Under suspicion on the amphetamine intoxication 66 people (14.9% of all people examined on the suspicion on the drug of abuse intoxication, amphetamine, metamphetamine and MDMA-(Ecstasy) were examined. According to the age groups, at the age of 14 there was no registered person, 15-19 were 5 people (13.2%), 20-24 years 17 people (44.7%), 25-29 years 9 people (23.7%), 30-65 years old 7 people (18.4%). In 10 people (26.3%) PSS score 0 was determined, mild poisoning had 22 people (57.9%), 5 patients (13.2%) were with the signs of moderate poisoning, and 1 people (2.6%) had PSS 3.

A total of 3 patients (0.8%) were examined on suspicion of acute intoxication with synthetic cannabinoids. In this group were people who abused drugs, newly synthesized substances.

Analysis of Distribution according to the age groups, at the age 15-19 were 1 patient (33.3%), 20-24 years old 1 people (33.3%), at the age of 30-65 was 1 person (33.3%). The PSS 0 score was established in 1 case (33.3%), mild poisoning had 2 people (66.7%).

For a total of 37 cases (10.4% of all people examined under suspicion on the drugs of abuse intoxication), the agent and nature of poisoning was not determined. In this group there were no fatal outcomes, but moderate and severe poisoning was registered in 5 people (13.5%). These findings indicate the number of intoxication when causative agent could not have been determined with certainty, despite the use of modern analytical equipment. The appearance of new psychoactive substances for which there are still no standardized analytical methods, also aggravates this problem.

In the **Clinic for emergency and clinical toxicology** 32 patients were admitted, thay were all 19-65 years old (working age), which makes 9.0% of the total number of patients examined due to acute intoxication by these agents. According to the age groups, 20-24 years 8 people (25.0%), 25-29 years 7 people (21.9%), 30-65 years old 17 people (53.1%).
PSS score of 0 was registered in 7 patient (21.9%), due to mild drug of abuse intoxication (PSS 1) 1 person were admitted (3.1%). Moderate intoxication was registered in 4 patients (12.5%), due to severe intoxication (PSS 3) 19 patients (59.4%) were treated, and the lethal outcome (PSS 4) was noted in 1 patient (3.1%).
Due to acute intoxication with drugs of abuse 23 males (71.9%) and 9 females (28.1%) were hospitalized.

The most common causative agent in hospitalized patients was heroin (22 persons, 68.8%). According to the age groups, at the age of 20-24 there were 5 people (22.7%), 25-29 years 6 people (27.3%), 30-65 years old 11 people (50.0%). PSS 0 was registered in 6 patients (27.3%). PSS 1 in 1 patient (4.5%), due to moderate poisoning 1 people (4.5%), due to severe poisoning (PSS 3) 14 patients (63.3%).

One patient was admitted to Clinic due to toxic effects of cocaine (3.1%) and it was severe intoxication. Three patients (9.4%) were hospital treated after the abuse of amphetamines, one with an estimated weight of poisoning PSS 1, one with PSS2 and one with PSS 3.
Finally, 5 patients (15.6%) were admitted in the Clinic, and the certain causative agent was not determined. There were one fatal outcomes in this group.

Gases
Due to suspicion on acute gas exposure and intoxication in **DRT NPCC** 194 patients (4.2%) of all examined, and 17 people (2.6% of patients examined due to acute gas intoxication) were admitted for hospital treatment. According to gender there were 100 males (51.5%) and 94 females (48.5%).

Predominant causative agents were smoke inhalation (80 patients; 41.2%), chlorine fumes from household products (43 patients; 22.2%) and carbon monoxide (25 patients; 12.9%), which represents 76.3% patients examined due to gas exposure and intoxication.

In the other (46; 23.7%) patients, (20), vapors of base and acid (11), varnishes and solvents (10), respectively 9), oil and petroleum products (3) and other agents (22) were registered as a cause of poisoning.
The majority of them, 156 patients (80.4%) were at the age 19-65. Older than 65 years 33 (17.0%) patients were, younger then 18 were 63 (32.5%). PSS score of 0 was registered in 71 patients (37.6%), clinical picture of mild poisoning was found in 82 (42.3%), and moderate poisoning in 5 patients (2.5%). Anamnestic suspicion on the underlying gas intoxication was not confirmed in 33 patients (17.0%).

Among 17 **hospitalized patients** (2.6% of all hospitalized patients), 11 were male (64.7%) and 6 female (35.3%). The most common causes were smoke inhalation, carbon monoxide, chlorine fumes from household products (11, 4, 2; 64.7%, 23.5%, 11.8%). The majority of them, 9

patients (53.0%) were at the age older than 65 years, 19-65 8 (47.0%) patients and with no registrated minors. Clinical picture of mild poisoning (PSS1) was found in 6 patients (35.3%) and moderate poisoning (PSS 2) in 6 patients (35.3%). Four patients (23.5%) had signs of severe poisoning (PSS3). There was 1 (1; 5.9%) fatal outcome (PSS 4) in this group, after intoxication with smoke inhalation.

Pesticides

Due to acute pesticide exposure and intoxication in the **DRT PCC** 78 patients (1.7%) of all examined patient. According to gender there were 47 males (60.3%) and 31 females (39.7%). Because of the well-known seasonal distribution of this type of poisoning (agricultural work), 47 (60.3%) patients contacted the physician in the period between April and July.

Due to acute pesticide poisoning, 26 patient were admitted for hospital treatment, which represents 33.3% of patients examined.

The majority of them, 56 patients (71.8%) were at the age 19-65, older than 65 years were 20 (25.6%) patients, and 2 patient was younger then 18 (2.6%). Due to suspicion on the acute organophosphorus insecticide and herbicide intoxication (26 patients; 13 in each group; 16.7%) were examined. In 26 cases (33.3%) a PSS score of 0 was registered, mild poisoning (PSS 1) was registered in 19 patients (24.4%), moderate (PSS 2) in 3 patients (3.8%), and 6 patients (7.7%) had clinical features of severe poisoning (PSS 3) at the admission. Suspicion on the underlying intoxication was not confirmed in 24 patients (30.8%).

In the Clinic for emergency and clinical toxicology due to acute pesticide intoxication 26 patients, which represent 3.9% of all hospitalized patients, were treated. The most common toxic agents were from the organophosphorus insecticide group (11 cases; 42.3% of all pesticides). The herbicides intoxication was represented less frequently (7; 26.9%), the other pesticides were represented in 8 patients (30.8%).According to gender, there were 11 males (42.3%) and 15 females (57.7%); the majority of them in 61.6% cases were at the age of 19-65 (16 patients). Older than 65 years were 9 patients (34.6%), and one patient was minor (1; 3.8%).

PSS 0 was registered in 4 patients (15.4%), mild poisoning (PSS 1) was registered in 13 patients (50.0%), moderate (PSS 2) in 3 (11.6%), and due to severe poisoning (PSS 3) 5 patients (19.2%) were treated. The fatal outcome (PSS 4) was registered in 1 patient (3.8%).

Corrosives

Due to suspicion on the acute corrosive compound poisoning in the **DRT PCC**, a total of 78 patients (1.7% of all examined patients) were examined, and 57 of them (73.1% of this type of poisoning cases) were admitted for hospital treatment. The most common agents were hydrochloric (27 patients; 34.6%) and acetic acid (11; 14.1%). Four patients (5.1%) were examined due to the sodium hydroxide ingestion, 8 people due to the other acids (10.3%); 6 people (7.7%) due to the bleach compounds, cleaners (11; 14.1%) and other corrosive compounds (11 persons; 14.1%).

According to gender, 42 (53.8%) people were female, and 36 (46.2%) male. Four minor was registered (5.1%), 57 patients (73.1%) were from 19-65 years, and 17 patients (21.8%) were older than 65 years.

PSS score of 0 was registered in 18 patients (23.1%), clinical features of mild poisoning (PSS 1) was noted in 19 patients (24.3%), moderate (PSS 2) in 12 (15.4%), and 27 patients (34.6%) had severe poisoning at the admission. In 2 patients (2.6%) suspicion on the underlying intoxication was not confirmed.

In the **Clinic for emergency and clinical toxicology** due to the acute corrosive poisoning 57 patients were hospitalized, which represent 8.6 % of all hospitalized patients. The most common ingested agent was hydrochloric acid (24 cases; 42.1%), and then acetic acid (11 cases; 19.3%). Three hospitalized patients (5.3%) ingested sodium hydroxide, and other agents (bleach compounds 6, other acids 6, other corrosive compounds 7) in 19 patients (33.3%).

Men (29; 50.9%) and women 28 (49.1%) were almost equally represented. At the age of 19-65 years were 42 patients (73.7%), three minors (5.3%) and 12 people were older than 65 years (21%).

PSS score of 0 was registered in 3 people (5.3%), and 15 patients (26.3%) had clinical features of mild poisoning. Due to moderate poisoning 12 people (21.0%) were treated, and due to severe poisoning 20 people (35.1%). Lethal outcome was registered in 7 patients, which represent 12.3% of all treated patients of corosive intoxication. At the same time, it represents 25.0% of all deaths at the Clinic in 2016 which once again, confirmed a multi-year trend of constantly the highest rates of mortality, in this group causes of poisoning.

Mushrooms and plants

Due to acute mushroom and plant poisoning in the **DRT PCC** 84 patients, 48 (57.1%) males and 36 (42.9%) females, were examined. In 67 people (79.8%) there was a suspicion of acute mushroom poisoning, 3 people ingested the seeds of the plant tatula (*Datura stramonium)* (3.6%), and 1 person consumed cuckoopint *(Arum maculatum*) and one tobacco. Twelve persons ingested unidentified mushrooms (14.3%). All mushroom poisonings were accidental.

There was no people younger than 18 years, 69 people (82.1%) were at the age 19-65, and 15 examined patients were older than 65 years (17.9%). PSS score of 0 was registered in 9 people (10.7%), clinical features of mild poisoning (PSS 1) was noted in 12 people (14.3%), moderate poisoning in 3 person (3.6%), 2 people had clinical features of severe poisoning (2.4%), and for 58 persons, it was concluded that there was no ingestion of poisonous mushrooms or plants (69.0%).

Nineteen people (22.6% of outpatient examined patients) were admitted in **the Clinic for emergency and clinical toxicology** for further diagnosis, observation and treatment (10 males and 9 females). Sixteen (84.2%) patients were at the age 19-65 and 3 (15.8%) older than 65 years.

Due to suspicion of acute mushroom intoxication 17 patients (89.5%) were admitted, 2 patients (10.5%) due to acute *Datura stramonium* intoxication. Seven patients (36.8%) had clinical features of mild poisoning (PSS 1), 2 patient (10.5%) had signs and symptoms of moderate (PSS 2), and 1 person has clinical features of severe poisoning (PSS 3). One patient died (PSS 4), because of Amanitin syndrome, in 8 persons (42.1%) was concluded to have no poisonous mushrooms or plants ingestion.

Other agents

This group consisted of patients (97; 2.1% of all outpatients) who were exposed to or intoxicated with toxic alcohols, various industrial products (organic solvents, detergents, disinfectants) and other agents. The **DRT PCC** registered 91 cases, the **Clinic for Emergency and Clinical Toxicology** an additional 6 cases. In 1 patient were registered lethal outcome (PSS 4). It was intoxication with a nitrosolvent in a old patient with acute deterioration of several chronic diseases.

Other diseases

During the 2016, in 27 people (0.6% of the examined patients) were concluded that it was some other, nontoxicological etiologic factor. All of these cases were resolved in DRT NCKT without indications for hospitalization in the Clinic.

Department for Toxicological Chemistry

During the 2016 in the Department for toxicological chemistry PCC of MMA 13304 analyses were done. Analyses were performed according to the requirements of the MMA organizational units, the Army of Serbia and the demands of civil health care institutions. Certain numbers of analysis were performed as a part of the MMA scientific research projects, but also in order to maintain and improve the quality of analytical procedures. The overall review of the Department work is shown in the Tables 11-17.

Table 11 - Analysis performed according to the requirements of the various MMA organizational units and the other Serbian Army organizational units

Types of analysis	Number	%
Alcohols	1567	29.6
Benzodiazepines	999	18.8
Antiepileptics	271	5.1
Antidepressants	142	2.7
Neuroleptics	65	1.2
Psychoactive substances	1105	20.8
Medicaments (other)	701	13.2
Metals (Zn, Cu)	119	2.2
Pesticides	108	2.0
RBC cholinesterase	209	4.0
Identification	13	0.2
Others	8	0.2
Total	5307	100.0

Table 12 - Analysis performed according to the requirements of the various Serbian Army organizational units (protocol BIOGNOST)

Types of analysis	Number	%
Psychoactive substances	745	99.9
Alcohols	1	0.1
Total	746	100.0

Table 13 - Analysis performed as a part of the MMA scientific research projects

Analysis	Number
RBC cholinesterase	246
Total	246

Table 14 - Analysis performed according to the requirements of the Ministry of Internal Affairs of the Republic of Serbia

Types of analysis	Number
Alcohols	1342
Total	1342

Table 15 - Analysis performed according to the requirements of the civil institutions

User/analysis	Number	%
Alcohols	156	4.0
Benzodiazepines	149	3.9
Antiepileptics	453	11.7
Antidepressants	32	0.8
Neuroleptics	41	1.1
Psychoactive substances	350	9.0
Medicaments	339	8.8
Metals	30	0.8
Pesticides	21	0.5
RBC cholinesterase	37	1.0
Identification	11	0.3
Others	4	0.1
Civil institutions (total)	1623	42.0
Alcohol Medicaments PAS Others	586 1557 100 5	15.1 40.2 2.6 0.1
Judicial material (total)	2248	58.0
Total	3871	100.0

Table 16 - Analysis performed as a part of the maintenance and enhancement of quality of the analytical procedures

Types of analysis	Number
Standards, controls, tests (medicaments, opiates, antiepileptics, pesticides)	2518
Validation of methods (calibration curves)	200
Interlaboratory analysis (medicaments, opiates, antiepileptics, cholinesterase)	66
Total	2784

Teaching activity

Several teachers and associates of the Department participated in the teaching process at the Faculty of Medicine of MMA. Within the obligatory course Medicinal chemistry and elective corse Phytotherapy 2 teachers and 1 teaching associate.

During 2016 the Department is accredited for a total of 66 analytical methods (Table 17).

Table 17 - Accredited analytical methods (20.102016.)

1. Determination of carbamazepine in serum samples by HPLC-UV method
2. Determination of lamotrigine in serum samples by HPLC-UV method
3. Determination of methadone in urine samples by HPLC-PDA method
4. Determination of methadone in urine samples by LC-MS method
5. Determination of ethanol and methanol in serum, urine and lavage samples by GC-FID method
6. Determination of lorazepam in biological material by HPLC-PDA method
7. Determination of theophylline in biological material by HPLC-PDA method
8. Determination of diazepam and its metabolites temazepam and oxazepam in biological material by HPLC-PDA method
9. Determination of diclofenac in biological material by HPLC-PDA method
10. Determination of bromazepam in biological material by HPLC-PDA method
11. Determination of amitriptyline in biological material by HPLC-PDA method
12. Determination of carbamazepine in biological material by HPLC-PDA method
13. Determination of nimesulide in biological material by HPLC-PDA method
14. Determination of diazepam and its metabolites in biological material by LC-MS method
15. Determination of lamotrigine in biological material by HPLC-PDA method
16. Determination of clonazepam in biological material by HPLC-PDA method
17. Determination of sulpirid in biological material by HPLC-PDA method
18. Determination of olanzapine in biological material by HPLC-PDA method
19. Determination of opiates in biological material by LC-MS method
20. Determination of DNOC in commercial and biological samples by HPLC-PDA method
21. Identification of drug of abuse in urine by immunochromatography method
22. Determination of sertraline in biological material by HPLC-PDA method
23. Determination of maprotilin in biological material by HPLC-PDA method
24. Determination of mianserine in biological material by HPLC-PDA method
25. Determination of fluoxetine in biological material by HPLC-PDA method
26. Semiquantitative analysis of medicaments and their metabolites- by screening method HPLC-PDA
27. Determination of cholinesterase activity by spectrophotometric method
28. Determination of sulpirid in biological material by LC-MS method
29. Determination of bromadiolone in commercial and biological samples by HPLC-PDA method
30. Determination of warfarine in biological material by HPLC-PDA method
31. Determination of copper in biological material by ICP-OES method
32. Determination of zinc in biological material by ICP-OES method

(extension) Table 17 - Accredited analztical methods (20.10.2016)

33. Determination of olanzapine in biological material by LC-MS method
34. Determination of sertraline in biological material by LC-MS method
35. Determination of trihexyphenidyl in biological material by LC-MS method
36. Determination of atropine in biological material by LC-MS method
37. Determination of sildenafil in biological material by LC-MS method
38. Determination of colchicine in biological material by HPLC-PDA method
39. Determination of colchicine in biological material by LC-MS method
40. Determination of midazolam in biological material by LC-MS method
41. Determination of gliclazide in biological material by LC-MS method
42. Determination of midazolam in biological material by HPLC-PDA method
43. Determination of gliclazide in biological material by HPLC-PDA method
44. Determination of clozapine and its metabolites in biological material by HPLC-PDA method
45. Determination of paroxetine in biological material by HPLC-PDA method
46. Determination of zolpidem in biological material by HPLC-PDA method
47. Determination of fluphenazine in biological material by HPLC-PDA method
48. Determination of chlorpromazine in biological material by HPLC-PDA method
49. Determination of opiates in human hair by LC-MS method
50. Determination of diazepam in human hair by HPLC-PDA method
51. Identification of medicaments and drug of abuse in biological samples by HPLC-PDA screening method
52. Identification of medicaments and drug of abuse in biological samples by LC-MS screening method
53. Determination of bisoprolol in biological material by LC-MS method
54. Determination of acetaminophen in biological material by HPLC-PDA method
55. Determination of acetaminophen in biological material by LC-MS method
56. Determination of tramadol in biological material by HPLC-PDA method
57. Determination of tramadol in biological material by LC-MS method
58. Determination of atenolol in biological material by LC-MS method
59. Determination of risperidone in biological material by LC-MS method
60. Determination of propranolol in biological material by LC-MS method
61. Determination of propranolol in biological material by HPLC-PDA method
62. Determination of enalapril in biological material by LC-MS method
63. Determination of trazodone in biological material by HPLC-PDA method
64. Determination of trazodone in biological material by LC-MS method
65. Determination of bisoprolol in biological material by HPLC-PDA method
66. Determination of THC-carboxylic acid in biological material by LC-MS method

Department for Experimental Toxicology and Pharmacology

During 2016, members of the Department were involved in the activities of MMA, the Ministry of the Science and Technology of the Republic of Serbia and the other civilian institutions in the country which are listed below.

1. For the purposes of The Faculty of Medicine MMA University of Defense, one Senior Research Associate of the Department was involved:

- in teaching process at Biomedicine doctoral studies at the following subjects: Pharmacological and toxicological aspects of reactions to stress, Pathophysiological, diagnostic and therapeutic aspects of acute poisoning, Ethics in biomedicine, Experimental models in biomedicine, Molecular mechanisms of action of drugs and poisons and Methodology of preclinical and clinical drug trials;
- in mentoring cadets at the Faculty of medicine of MMA (preparation of scientific publication in the field of experimental pharmacology and toxicology).

2. For the needs of Ministry of Science and Technology of the Republic of Serbia, one Senior Research Associate of the Department has participated:

- in the Committee for the election of candidates from the Faculty of Pharmacy in Belgrade to the position of Teaching Assistant.

Due to changes in legislation and harmonization with the relevant EU directives, preclinical testing for the needs of various civil institutions in the country could not have been done. Therefore, in the second half of the year started a procedure approved by the Head of the MMA to obtain the necessary certificates for the work of the Ministry of Health and Ministry of Agriculture and Environment of the Republic of Serbia.

After the inspection of the aforementioned ministries inspection teams, the following activities were completed:

- Laboratory of the Department for experimental toxicology and pharmacology, as one of the laboratories of the Institute for toxicology and pharmacology from the NPCC and Centre for clinical pharmacology of the Faculty of Medicine MMA, was enrolled as a whole in the National Register of Laboratories, for the activities: the bioavailability and/or bioequivalence, preclinical trials of drugs for use in human and veterinary medicine, safety testing of substances that are part of the drugs, pesticides, biocides, cosmetics, food additives, industrial chemicals and nanoparticles (Ministry of Health of the Republic of Serbia, decision No 515-04-3723/2015-11 of 08.07.2016.);

- facilities of the Department for performing experiments on animals, has been included in the National Register of experiments on animals as the Institute for Toxicology and Pharmacology, PCC, MMA (Ministry of Agriculture and Environmental Protection of the Republic of Serbia, decision No: 323-07-04943/2014-05/1 of 17. 12. 2014.);
- the laboratories of the Institute for toxicology and pharmacology PCC MMA are in the process of obtaining approvals and certificates of Good Laboratory Practice for the activities listed above.

3. Professional training

Senior Research Associate of the Department attended classes in the country and abroad, passed all required exams, and acquired:

- the License for Good Laboratory-Clinical Practice in accordance with directives of EU and FDA regulations of USA;
- the License for Good Clinical Practice in accordance with directives of EU and FDA regulations of USA;
- the License for Informed consent in accordance with directives of EU and FDA regulations of USA;
- the License for Study protocol in accordance with directives of EU and FDA regulations of USA.

4. Expansion of activities of the Department

Based on the issued decision on the registration of Laboratory of the Department in the Register for experiments on animal, all the activities for the introduction of all reported experimental methods were carried out. Thereby to the end of 2015, a total of 30 methods from the field of experimental toxicology, experimental pharmacology and experimental pathology were harmonized with requirements of ISO standards 9001:2008, as well as the Directives of the European Commission 2004/9 and 2004/10, applicable OECD quidelines and the quidelines of the International Conference on Harmonization (ICH).

Mobile toxicological-chemical team

During 2016, members of the MTC unit participated in planning, preparation, implementation or medical support of numerous tasks and activities:

- Exercise demonstrations of the Training center of the Serbian medical army corp in MMA: „Spring 2016“ and „Autumn 2016“;
- Command – tactical exercise „Morava 2016“, Training field „Ravnjak“ - Krusevac;
- Training exercise for inspectors of the Organization for the Prohibition of Chemical Weapons (OPCW) in the CBRN Training centre – Krusevac;
- Periodical practical training in using PPE (Personal Protective Equipment). The entire staff of NPCC MMA participated in the drill;
- The number of different activities whose holders with other servicies of MO and SA, related with highly toxic agents.

Pictures 10, 11, 12 and 13 - The Mobile toxicological - chemical team at the exercise "Spring 2016"

Selected cases

This section gives a brief overview of 32 cases of patients with lethal outcome whose death was to some extend connected with the causative agent (Table 18).

Table 18 - Brief overview of the case of patient with lethal outcome agents

S. No	Gender	Age (year)	Causative agent	Connection with the cause (RCF)	Case report
1.	M	71	Hypothermia, Ethyl alcohol	Contributed	The patient was admitted in severe hypothermia, significantly impaired vital functions. In spite of the all therapeutic measures, a few hours after admission, a fatal outcome was noted.
2.	M	82	Medicaments (dizepam)	Undoubtedly proven	The patient was admitted for acute severe diazepam intoxication, complicated by the development of bronchopneumonia and cardiac decompensation.
3.	M	67	Corrosive agent (hydrochloric acid)	Undoubtedly proven	Ingestion; severe hydrochloric acid poisoning complicated by bilateral pneumothorax. The fatal outcome was registered a few hours after the reception
4.	M	64	Medicaments (olanzapine, haloperidol, sertraline, lorazepam) Carbon monoxide	Undoubtedly proven	Severe self-intoxication; coma, the treatment was complicated by bronchopneumonia and acute respiratory insufficiency.
5.	M	65	Ethylene glycol	Undoubtedly proven	Ingestion; coma, severe metabolic acidosis, acute renal failure; treatment was complicated by bilateral bronchopneumonia, respiratory and cardiocirculatory failure, gastrointestinal bleeding.
6.	M	85	Gases from fires Corrosive agent (concentrated acetic acid)	Undoubtedly proven	Exposure, poisoning was manifested by symptoms of respiratory irritation with elevated carboxyhemoglobin levels, and complicated by bronchopenumonia, and later by the development of CVI.
7.	Ž	68	Medicaments (suspected), Koma of unknown etiology, Dehydration, Respiratory insuf., pseudomembranous colitis	Certainly not contributed	Received due to severe general condition impairment (dehydration, coma) and suspicion of acute drug intoxication, which is excluded after receiving. The clinical course was complicated by respiratory failure, pseudomembranous enterocolitis, and gastrointestinal bleeding.
8.	Ž	43	Medicaments (suspected), Sepsis, Bronchopneumonia, (PTE in obs.), Respiratory insuf.	Certainly not contributed	Received due to suspicion of acute intoxication with drugs that have not been confirmed by toxicological analyzes. Patients was received in a clinic with signs of sepsis, developed by respiratory failure. After 14 hours from the reception, fatal outcome was registered.
9.	M	89	Corrosive agent (hydrochloric acid)	Undoubtedly proven	Ingestion; corrozive damage of GIT III degree, severe and repeated GIT bleeding, development of bronchopneumonia
10.	Ž	81	Medicaments (verapamil, ramipril, sulpiride, trazodone)	Undoubtedly proven	A picture of a severe self-intoxication; acute respiratory and cardiocirculatory insufficiency, aspiration bronchopneumonia.
11.	M	79	Medicaments (warfarin, nifedipine)	Undoubtedly proven	Ingestion; a patient with an advanced malignancy, severe poisoning with hypotension, high INR values, and gastrointestinal bleeding.
12.	M	82	Corrosive agent (concentrated acetic acid)	Undoubtedly proven	Ingestion; hospitalization shorter than 24 h; metabolic acidosis, respiratory and cardiocirculatory insufficiency.

(extension) Table 18 - Brief overview of the case of patient with lethal outcome agents

13	M	55	Medicaments (chlorpromazine, lorazepam)	Probably did not contribute	Severe self-intoxication, in the initial recovery phase, the patient aspirated the content of the food, then he was reanimated with posthipoxy encephalopathy. He died due to the development of complications.
14.	Ž	91	Pesticide (unknown)	Probably contributed	Ingestion; coma, acute respiratory insufficiency.
15.	M	44	Medicaments (propranolol, diazepam, clozapine)	Probably did not contribute	Ingestion; prior toarriving to our institution reanimated due to cardiac and respiratory arrest; during hospitalization without recovery.
16.	Ž	84	Nitro solvent	Probably contributed	Ingestion; hypotension, acute respiratory failure, deterioration of the underlying lung disease (HOBP)
17.	M	87	Medicaments (nitrazepam)	Undoubtedly proven	Severe self-intoxication, the treatment was complicated by bilateral bronchopneumonia and acute respiratory failure.
18.	M	77	Corrosive agent (acetic acid)	Undoubtedly proven	Severe corrosive damage, respiratory failure, repeated gastrointestinal bleeding
19.	Ž	59	Mushrooms (Amanitin Syndrome)	Undoubtedly proven	Ingestion of mushrooms; severe hepatotoxicity with the development of hepatic encephalopathy
20.	Ž	63	Mushrooms (suspicion) Acute pancreatitis	Certainly not contributed	Received for suspected mushroom poisoning; clinical, laboratory and radiographic confirmation of acute pancreatitis; acute renal failure
21.	Ž	68	Medicaments VPA	Undoubtedly proven	Self-intoxication of a patient with an advanced malignancy of the lung disease; coma, respiratory and cardiocirculatory insufficiency
22.	Ž	62	Corrosive agent (acetic acid)	Undoubtedly proven	Ingestion; hospitalization shorter than 24 h; susceptible stomach perforation, acute respiratory and circulatory insufficiency
23.	M	63	Drugs (bromazepam, cilazapril)	Undoubtedly proven	Coma, acute respiratory insufficiency, hospitalization shorter than 24 h
24.	Ž	68	Medicaments (suspected) Supraventricular tachycardia, respiratory and cardiocirculatory insufficiency	Certainly not contributed	Received due to severe general deterioration, with suspicion of acute drug intoxication, during the treatment of repeated episodes of rapid supraventricular tachycardia and the development of cardiac arrest during repeated treatments
25.	Ž	38	Medicaments (methadone, bromazepam)	Probably contributed	A long-standing opiate addict, with repeated venous thromboses of the lower extremities, hepatitis C, signs of hepatic insufficiency, anemic syndrome and global heart and respiratory insufficiency.
26.	Ž	80	Corrosive agens (acetic acid)	Undoubtedly proven	Ingestion; enlarged malignant disease; GIT bleeding, susceptible stomach perforation, bronchopneumonia
27.	M	83	Corrosive agens (acetic acid)	Undoubtedly proven	Ingestion; severe acute intoxication with acetic acid, with manifest gastrointestinal bleeding, metabolic acidosis, ARI and susceptible stomach perforation
28.	Ž	85	Corrosive agens (acetic acid)	Undoubtedly proven	Ingestion; severe poisoning, cardiocirculatory and respiratory insufficiency, hospitalization shorter than 24 h.
29.	Ž	55	Drugs (risperidone, theophylline)	Contributed	Received due to drug overdose, with worsening of HOBP and the development of severe global respiratory failure.
30.	Ž	75	Drugs (clozapine)	Undoubtedly proven	Severe poisoning with the development of complications (bronchopneumonia, acute respiratory insufficiency, and then esophageotracheal fistulae)
31.	Ž	46	Drugs (verapamil, chlorpromazine, bromazepam, olanzapine)	Undoubtedly proven	Respiratory and cardiocirculatory insufficiency. Immediately started the CPR measures that were without adequate response.
32.	M	33	Ethyl alcohol	Contributed	Patient alcoholized with numerous deep cuts in the area of the right cubital cavity, pale, hypotensive. During the observation respiratory and cardiac arrest develops, without response to the applied CPR measures.

List of abbreviations and explanations

ARI – Acute renal insufficiency

CBRN – Chemical, biological, radiological, nuclear

ARF – Acute respiratory failure

ACE inhibitors – Angiotensin-converting enzyme inhibitors

Ca inhibitors – Calcium channel inhibitors

CVI – Cerebrovascular insult

NPCC – National Poison Control Center

DNOC – dinitro-o-cresol

Datura stramonium (Latin) – tatula (Serbian language), **jimsonweed** or **Devil's snare,** other common names: hell's bells, devil's trumpet, devil's weed, *tolguacha*, Jamestown weed, stinkweed, one-year plant, containing atropine, hyoscyamine, hyoscine, scopolamine, stramonin etc.

DRT – Department of resuscitation and triage

Drug of abuse – a compound that causes addiction (illegal production and trafficking, prohibited by law)

EGDS – Oesophagealgastroduodenoscopy

EU – European Union

FDA – US Food and Drug Administration

GC – Gas chromatography

GIT – Gastrointestinal tract

HOBP – Chronic obstructive pulmonary disease

HPLC/PDA – High-performance liquid chromatography, Liquid chromatography with UV detector (190-400nm)

ICH – International Conference on harmonisation - International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use

ICP-MS – Inductively coupled plasma mass spectrometry

ICP-OES – Inductively Coupled Plasma Optical Emission Spectrometry

ISI – Institute for Scientific Information

CPR – Cardio-pulmonary resuscitation

Lethality – the ratio of deaths to the total number of patients suffering from certain diseases

MAOI – Monoamine oxidase inhibitors

MCT team – Mobile chemical-toxicological team

MD – Ministry of Defense

MIA – Ministry of Internal Affairs

MMA – Military Medical Academy

MSCT – Multi-slice computed tomography

NMR – Nuclear magnetic resonance

NSAID – Non-steroidal anti-inflammatory drugs

OECD – Organisation for Economic Co-operation and Development

OFI – Organophosphorus insecticides

OPCW – Organisation for the Prohibition of Chemical Weapon

PAS – Psychoactive substances

PPE – Personal Protective Equipment

PSS – Poisoning Severity Score – severity of poisoning, 5-point scale:

PSS – 0 (asymptomatic)

PSS – 1 (mild)

PSS – 2 (moderate)

PSS – 3 (severe)

PSS – 4 (fatal)

RCF – Relative Contribution to Fatality – Relative participation of causative agents in fatal outcome; 6-level scale:

1 – undoubtedly proven

2 – probably

3 – contributed

4 – probably did not contribute

5 – certainly not contributed

6 – unknown

SAF – Serbian Armed Forces

SSRIs – Selective Serotonin Reuptake Inhibitors

WHO – World Health Organization

UV VIS – Ultraviolet-visible spectroscopy

UPLC/MS – Ultra performance liquid chromatography in combination with electrospray ionization and mass spectrometry

VPA – Valproic acid or Valproate

IT support to the NPCC work

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Reports of health institutions in the Republic of Serbia

(a summary of the number and basic characteristics of acute poisoning)

The intention of the relatively small team from the Poison Control Centre of MMA, which for the sixth time in a row publishes the Annual Report, was in the number for 2015., to present concisely, but yet detailed, all relevant data related to acute poisoning, which are fully or partially therapeutically resolved at the MMA.

Appreciating own efforts, but also the efforts of many dear colleagues across the country, we tried to, first of all by personal contacts, and on the other ways, get to a structured data on acute poisoning from other health centers in the country.

A number of institutions which are shown below (in alphabetical order), were responded to this invitation.

Since the methodology (classification) of the received data was relatively uneven (some institutions used the ICD classification, a number of health institutions are not able to clearly identify toxins/drugs), we decided, aware of the risks that each transformation causes, to conform collected data to the methodology used in the Poison Control Centre. Time limits and the need to issue an Annual Report on time did not allow us further coordination with other health institutions in the country.

This work we started with a lot of attention, but also aware of the possibility of subsequent errors. We hope that, by this procedure, we did not (inadvertently) created a distorted picture of the situation and characteristics of acute poisoning in the Republic of Serbia.

According to the Law on Health Care (Article 92), Poison Control Centre, among other things, collects and processes data on the effects of toxic chemicals and natural toxins, keeps a register of incidents of poisoning and participates in the formation and supervision of the Central stocks of antidotes in the Republic. By the new Law on health records will be defined the regulations and forms with the necessary data on acute poisoning.

With gratitude to all the people and institutions who have sent us reports, we are firmly committed, that with better cooperation and coordination, the next Annual report would be improved and supplemented with complete reports from other health centres in Serbia.

Appendix 1 Health Centre, Aranđelovac

The dominant cause	n	%
Alcohol	1	3.8
Drug of abuse	2	7.8
Medicaments	9	34.7
Psychoactive	7	26.9
Other	2	7.8
Gases	1	3.8
Corossives	1	3.8
Pesticides	1	3.8
Other agents	11	42.3
Total	26*	100.0

* Lethal outcome is not registered, under "Other agents" all poisoning belong to mushroom poisoning

Appendix 2. The Institute for Health Protection of Mother and Child of Serbia „Dr Vukan Čupić“

The dominant cause	n	%
Alcohol	8	5.5
Drug of abuse	3	2.0
Medicaments	82	56.2
Psychoactive	33	22.6
Other	49	33.6
Gases	3	2.0
Corossives	20	13.7
Pesticides	2	1.4
Other agents	26	17.4
Unknown	2	1.4
Total	146*	100.0

* Lethal outcome is not registered

Appendix 3. General Hospital, Vršac

The dominant cause	n	%
Alcohol	7	17.5
Drug of abuse	2	5.0
Medicaments	22	55.0
Psychoactive	12	30.0
Other	10	25.0
Pesticides	6	15.0
Other agents	1	2.5
Unknown	2	5.0
Total	40*	100.0

* Lethal outcome is not registered

Appendix 4. Health Centre „Lučani“, Guča

The dominant cause	n	%
Alcohol	6	37.5
Medicaments (psychoactive)	4	25.0
Corossives	4	25.0
Unknown	2	12.5
Total	16*	100.0

* Lethal outcome is not registered

Appendix 5. General Hospital „Đorđe Jovanović“, Zrenjanin

The dominant cause	n	%
Alcohol	24	22.2
Drug of abuse	3	2.8
Medicaments	50	46.3
Psychoactive	33	30.6
Other	17	15.7
Gases	3	2.8
Corossives	4	3.7
Pesticides	9	8.3
Other agents	6	5.6
Unknown	9	8.3
Total	108*	100.0

* 1 lethal outcome is registered (pesticide)

Appendix 6. Health Centre, kosovska Mitrovica

The dominant cause	n	%
Alcohol	2	13.3
Drug of abuse	1	6.7
Medicaments	11	73.3
Psychoactive	8	53.3
Other	3	20.0
Pesticides	1	6.7
Total	15*	100.0

* 2 lethal outcome are registered (metadon+heroin, acetilsalicile acid + dishwash liquid)

Appendix 7. Helth Center, Kragujevac

Helth Center Kragujevac has submitted the total number of acute intoxications (95) classified by months, but not by the type of etiological agens.

Appendix 8. General Hospital "Studenica", Kraljevo

The dominant cause	n	%
Alcohol	56	50.4
Drug of abuse	1	0.9
Medicaments	52	46.8
Psychoactive	43	38.7
Other	9	8.1
Corossives	2	1.8
Total	111*	100.0

* Lethal outcome is not registered

Appendix 9. General Hospital, Leskovac

The dominant cause	n	%
Alcohol	96	31.1
Drug of abuse	3	1.0
Medicaments	157	50.8
Psychoactive	150	
Other	7	
Gases	5	1.6
Corossives	16	5.2
Pesticides	20	6.5
Total	309*	100.0

* 11 lethal outcome are registered (pesticides - 8; alcohol - 1, corrosives – 1, psychoactive medicament - 1).

Appendix 10. General Hospital, Loznica

The dominant cause	n	%
Alcohol	6	15.4
Drug of abuse	9	23.0
Medicaments	20	51.3
Psychoactive	2	5.1
Other	18	46.2
Corossives	1	2.6
Pesticides	1	2.6
Unknown	2	5.1
Total	39*	100.0

* Lethal outcome is not registered

Appendix 11. Clinical Center, Niš

The dominant cause	n	%
Alcohol	572	55.9
Drug of abuse	41	4.0
Medicaments	263	25.7
Gases	12	1.2
Corossives	41	4.0
Pesticides	45	4.4
Other agents	41	4.0
Unknown	4	0.4
Total	1023*	100.0

* 17 lethal outcome are registered (pesticides - 8; alcohol - 1, corrosives - 6, medicament - 1, mushroom - 1).

Appendix 12. General Hospital, Pančevo

The dominant cause	n	%
Alcohol	41	28.3
Drug of abuse	2	1.4
Medicaments	80	55.2
Gases	3	2.1
Corossives	3	2.1
Pesticides	2	1.4
Other agents	5	3.4
Unknown	9	6.2
Total	145*	100.0

* Lethal outcome is not registered

Appendix 13. General Hospital, Čuprija

The dominant cause	n	%
Alcohol	9	14.3
Drug of abuse	3	4.8
Medicaments	44	69.8
Psychoactive	41	65.0
Other	3	4.8
Gases	2	3.2
Corossives	1	1.6
Pesticides	2	3.2
Other agents	2	3.2
Total	63*	100.0

*1 lethal outcome is registered (corrosives - concentrated acetic acid)

Appendix 14. Helth Center "Čačak", Čačak

The dominant cause	n	%
Alcohol	29	55.8
Medicaments	11	21.2
Gases	1	1.9
Pesticides	1	1.9
Corossives	4	7.7
Other agents	1	1.9
Unknown	5	9.6
Total	52*	100.0

* Lethal outcome is not registered

Appendix 15. General Hospital, Čačak

The dominant cause	n	%
Alcohol	55	48.2
Drug of abuse	3	2.6
Medicaments	42	36.8
Gases	5	4.4
Pesticides	3	2.6
Corossives	2	1.8
Other agents	4	3.5
Total	114*	100.0

* Lethal outcome is not registered

Appendix 16. General Hospital „Dr Laza K. Lazarević", Šabac

The dominant cause	n	%
Alcohol	18	33.3
Drug of abuse	1	1.9
Medicaments	35	64.8
Psychoactive	29	53.7
Other	6	11.1
Total	54*	100.0

* Lethal outcome (unknown)