Forensic Medicine in Lithuania
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Introduction
This chapter includes a short description of forensic medicine in Lithuania, the history of its development, main tendencies, current trends, the structure of forensic medicine services, current developments, main events, future perspectives, special issues on the framework and network of cooperation in the Baltic and other European regions foreseen because the degree of progress varies and the gaps should be reduced as in May of the year 2005 Lithuania joined the EU as a real member state.

One of ways to solve problems is to combine the powers of law enforcement institutions, including forensic science laboratories and legal medicine institutions which provide irreplaceable means for solving questions which may only be solved using special knowledge. The priority must be given to scientific research, a better management of the technology transfer process to facilitate exploitation of academic research with potential for application to crime prevention, detection technologies, to have an uninterrupted access to the full range of forensic and legal medicine services of the required quality standards.

History of forensic medicine
Lithuania’s name was first mentioned in records in 1009. During the period 1236-63, Duke Mindaugas united the Lithuanian ethnic lands and established the state of Lithuania, which was able to offer resistance against the eastward expansion of the Teutonic Knights.

The name of Lithuania had disappeared from the political map of Europe for 123 years when the major part of the former Grand Duchy of Lithuania was handed over to Russia. Lithuania began to recover only towards the end of the 19th century, the period known as the spring of nations. A struggle for national culture and reinstitution of writing spread over the greater part of the country. A unique movement, the book-bearers came about through self education and a concern for survival.

The Independent Republic of Lithuania was proclaimed on 16 February 1918 by the Lithuanian Council. In 1940, Lithuania was occupied by Soviet
Russia and remained incorporated in the Soviet Union until 1990, when
Lithuania declared the re-establishment of its independence.

On 11 December 1999, Lithuania was invited to start negotiations for the
European Union Membership. 2004 has been chosen as the date, by which
Lithuania was ready to assume the membership obligations.

The history of Forensic Medicine in Lithuania starts from the XVI century
when the Statute of the Great Principality of Lithuania was the first and most
significant restatement of actual law in Europe, whose provisions ensured
the solution of medical forensic problems, considered medical examination
to be the essential constitutive part of the legal process, assigned medically
experienced people to provide expert service of case prosecution [1].

The first forensic medical expertise examination was mentioned in the I-st
Lithuanian Statute in 1529 of the Great Duchy of Lithuania. The essential
regulation for violence against the person was not changed in the II-nd
(1566) and III-rd (1588) Lithuanian Statute (Fig. 1) [2].

Education & Teaching: the first teacher of Forensic Medicine in School of
the Great Principality of Lithuania in 1800 was Prof. August Liudvic Becu
(1771-1824) (Fig. 2), teaching students the course in Anatomy, Physiology,
Pathology, Pharmacology and other. Jan Lobenwein (1758-1820) (Fig. 3)
was the first Head and Prof. of Forensic Medicine Department in Vilnius
University. Prof. V. V. Pelikan (1790-1873) (Fig. 4) was the teacher of Fo-
rensic Medicine and Toxicology in Vilnius University for the fifth year
medical students in Latin.

Prof. J. J. Plenk (Fig. 5) published the Forensic Medicine Manual in 1781,
which was used for teaching of Forensic Medicine in Vilnius University.
The first Medicine Society and the Statute of Society (Fig. 6) were set up
in Vilnius in December, 1805.

Syllabus of Postgraduate Students (Fig. 7) was developed in Vilnius Uni-
versity, Lithuania in 1800 – 1801 and the „Catalogus Praelectionum in Caes-
sarea Universitate Vilnensi” 1806-1807 (Fig. 8).

Among most distinguished forensic medicine scientists having contrib-
uted to its development in Lithuania were prof. S. Bizio teaching foren-
sic medicine in Vilnius University Faculty of Medicine since 1781 till
V. Pelican – 1820-1824, J. Berkmanas – 1824-1843, Prof. S. Silingas-
Fig. 1a  1-st Lithuanian Statute in 1529 of the Great Duchy of Lithuania (Historical archives. Vilnius.).
Fig. 1b  II-nd Lithuanian Statute in 1566 of the Great Duchy of Lithuania (Historical archives, Vilnius.).

DISTINCTIO PRIMA
DE MAIESTATE, AVTO
RITATE ET IURISDIONE
PRINCIPIS.
ARTICULUS PRIMUS.
Omnes magni ducatus Lithuaniae inde us legibus hu
us statutti subesse debere.

ARTICULUS II.
Fig. 1c  III-rd Lithuanian Statute in 1588 of the Great Duchy of Lithuania
(Historical archives. Vilnius.).
Forensic medicine was also taught in Kaunas University. Since 1923 there worked V. Virsila who in 1922 published the first textbook on forensic medicine in the Lithuanian language “Teismo medicina” (Forensic Medicine), later – prof. K. Ozelis, B. Minelga. Since 1951 till 1989 Prof. J. Nainys – one of the most famous osteologist and anthropologist headed the Department of Forensic Medicine in Institute of Medicine in Kaunas.

Structure of forensic medical service

Today the forensic medical service is developed by the Institute of Forensic Medicine which is a research institute of Mykolas Romeris University in Vilnius. Mykolas Romeris University Institute of Forensic Medicine established in 2001 by the Government’s Resolution No. 369 after having reorganized the State Forensic Medicine Service. The Institute of Forensic Medicine Mykolas Romeris University is a state budget research institution with the status of a university research institute financed by the Government, having subdivisions in five cities and thirteen districts of Lithuania. It has been established with the aim of carrying out medicolegal investigations both at Lithuanian and international level, practical expertise activities by supplying its competence-related services at the Lithuanian Republic legal institutions’ request following the order established by laws; as well as at personally applying citizens’ request. The Institute has Departments of Forensic Clinical Expertise and Pathology, Forensic Toxicology, Serology and DNA, Medicine Criminalistics, Histology Lab, the Management and Scientific divisions. There are five experts divisions in main cities and nine expert’s subdivisions in districts of the Institute of Forensic Medicine in Lithuania [10].

In recent years’ the number of the investigations has been increasing. In year 2006 the following number of investigations were made in the Clinical Forensic field – 27375, External post-mortem examination performed at site – 967, Autopsies – 11645, Toxicology – 34060, DNA & Serology – 2345, Histology – 1594, Medicine Criminalistics – 745, Forensic Anthropology – 81. The forensic autopsy rate in Lithuania is 26%; the percentage of the violent death is 44%.

The Institute carries out scientific research in the field of forensic medicine and closely related areas in addition to providing basic training to medical students, postgraduate training for physicians specializing in forensic medicine and further scientific education.

The main goals of the Institute are as follows: the scientific investigation in the field of forensic medicine and related areas, participation in common
Fig. 2  Prof. August Liudvic Becu  
(1771-1824)

Fig. 3  Prof. Jan Lobenwein  
(1758-1820)

Fig. 4  Prof. V. V. Pelikan  
(1790-1873)
international programs and scientific investigation together with scientific centers of other countries, forensic medicine expertise and analysis, participation in processional proceedings specified by the Civil and Criminal Codes, preparation of new expert methods and their implementation into expert practice, continuous training of forensic medicine experts, providing qualifications and improvement.

As on 8th of December 1995 Lithuania submitted the application for membership in the European Union and from 15th of February 2000 Lithuania holds official negotiations with the European Union for membership, all legal aspects of forensic medicine trends were foreseen. On 23rd of June 2003 Lithuanian Association of Forensic Medicine acquired the Status of Observer to European Council of Legal Medicine – ECLM. The May of 2004 was the date by which Lithuania had assumed membership obligations.

Following the classification of scientific trends approved by the Commission of EU, which was approved by the Order of the Minister of Science and Education of the Republic of Lithuania (No.30 1998-01-09) the following scientific trends of biomedicine, medicine, forensic medicine have been chosen for the years 2003–2007: medical – biological expertise, the estimation of cause and time of death [3]. The document issued on 2 February 1999 by the Council of the Europe Committee of Ministers – Recommendation No. R (99)3 to Member States on the Harmonization of Medico-Legal Autopsy Rules was adapted and is followed in practical work in Lithuania [4].

Programs of scientific investigation of the Institute of Forensic Medicine for the years 2003-2007 were set up – application of the newest biotechnologies while creating modern methods of medical – biological expertise, estimation of cause and time of death by applying specific-complex investigations, looking for new methods and modeling.

In recent years not only the number of crimes has been increasing but also their type and manner are changing. Therefore the polymorphism and complexity of expertise require looking for the newest methods of investigation the implementation of which could help to better solve problems raised by the legal institutions.

During investigation of alive persons, performing toxicological analysis, investigating biological materials many specific questions arise which are either little described in the forensic medicine literature or have not been analyzed at all, or the experience of foreign countries in many cases can not be fully applied under the circumstances of Lithuania [6].
Fig. 5 Prof. J. J. Plenk, the Forensic Medicine Manual, published in 1781
Today the main issues of the Institute of Forensic Medicine are to prepare and implement new modern biotechnologies into practical expert activities which would meet the requirements of legal institutions for the expertise performed. To improve estimation of cause and time of death by applying specific-complex investigations, looking for new methods and modeling. To analyze and differentiate the factors which have caused the death and the mechanisms of making injuries. While performing forensic medicine expertise of the dead person’s evaluation of the cause and time of death is one of the most important issues. It is a standard question that forensic medicine experts are asked by the legal officials. Classical methods are used in estimating the cause and time of death. But that is not always enough, that’s why it is necessary to expand the investigation and look for new methods.

Basic aims and goals of the Forensic Medicine Institute activities are set on: fundamental and applied forensic medicine science investigations enabling the application world-wide research achievements and their improvement; performance of medico – legal expertise and investigations; preparation and implementation of Lithuanian and international research programs, joint projects with research establishments of foreign countries; preparation and practical implementation of new expertise work-related methods; continuous preparation-training of forensic medicine experts (specialists) – qualification raising and improvement; active co-operation with the University and participation in University study process.

Basic directions of research activities are developed on the application of the most recent biotechnologies in the creation of modern methods on medical-biological expertise and establishment of the causes and time of death by applying specific and complex investigations; search for new methods.

The following kind of expertise is performed: autopsies, alive persons, deontological, toxicological, serological, cytological, DNA, osteological, medicine criminalistics, trasological, identification of metal concentration in biological objects and histological expertise.

**Legal aspects**

According to Law passed by the Seimas of the Republic of Lithuania (Vilnius, 19 July 1994, No.I-552) Article 51 Forensic Expert Medical Examination: The forensic medical expert examination shall be performed based upon the decision of the interrogation bodies, investigation bodies, or per decision by the prosecutor, or court decision, as well. Expert examinations shall be performed by the State Forensic Medicine Service. The order of
Fig. 6  The Statute of Medicine Society, Vilnius, December 1805
the expert examination and performance is established by the Government of the Republic of Lithuania.

Article 52 Forensic Psychiatric and Forensic Narcological Expert Examination: Forensic psychiatric and forensic narcologic expert examinations shall be conducted based on the decisions by interrogation bodies, investigation bodies, or the prosecutor, as well as court decision. Expert examinations shall be performed by the State Forensic Psychiatric and Forensic Narcological Service. The order of organization and performance of the expert examination shall be established by the Government of the Republic of Lithuania.

Article 53 Pathoanatomical Expert Examination: Pathoanatomical expert examination shall be performed, following the death of an individual. The conditions and order of the pathoanatomical examination (autopsy) shall be regulated by laws and other legal acts [5].

National Society


Almost seventeen years ago on April 5, 1990 official representatives of Estonian, Latvian and Lithuanian medico-legal societies met in Vilnius in order to join together their efforts and bring into being an association of forensic scientists operating in the Baltic states area.

In the same year the Medico–Legal Society of the St.Petersburg region expressed a wish to join the newly established Association.

The Association’s congresses are held every three years in the capitals of the Baltic States and St. Petersburg in turn.

After quite a long period the 6th Congress of the Baltic Medico-Legal Association – BMLA – took place in Vilnius on June 14–16, 2007 – the city of its establishment. The scientific program of the congress was strengthened to achieve the adequate knowledge in preparation and implementation of new modern technologies into practical expert’s activities which would meet the requirements of legal institutions for the expertise performed. The emphasis on different level of forensic service is the critical issue which was discussed [9].

The nature of forensic science and legal medicine is broad and may extend beyond medical and legal issues, into scientific and technical areas, and
Fig. 7  The Syllabus of Postgraduate Students in Vilnius University, Lithuania, 1800-1801.
include specialists’ roles such as anthropology, toxicology, genetics, odontology, entomology and innovative non invasive methods like virtopsy.

On June 14-16, 2007 the most distinguished forensic medicine experts, researchers, scientists from all over the world gathered in Vilnius to participate in the 6th International Congress of the Baltic Medico Legal Association “New Technologies in Forensic Medicine” and discuss the most recent technologies, their application and development in forensic medicine. The special emphasis was given to ethical and human rights principles.

The organizer of this international event – Mykolas Romeris University Institute of Forensic Medicine, successfully developing both scientific and expertal activities, international cooperation, thanks to which the 6th International Congress of the Baltic Medico Legal Association has gained a wide international dimension – participants of the Congress represented all continents of the world.

This international event involved participation of such world-famous researchers, scientists as: Forensic Genetics: Prof. Angel Carracedo (Spain), Prof. Manfred Kayser (Netherlands), Prof. Tadeusz Dobosz (Poland); Forensic toxicologists: Prof. Olaf Drummer (Australia), Prof. Erkki Vuori (Finland), Prof. Ludwig von Meyer (Germany), Prof. Malgorzata Klys (Poland), Prof. Ashjorg Christophersen (Norway), Prof. Simona Ricci (Italy); Forensic pathologists: Prof. Pekka Saukko (Finland), Prof. Wolfgang Eisenmenger (Germany), Prof. Burkhard Madea (Germany), Prof. Ikuo Uekita (Japan), Prof. Marika Väli (Estonia), Prof. Viacheslav Popov (Russia); Specialists on virtopsy: Prof. Michael Thali (Switzerland), Dr. Marcel A. Verhoff (Germany); Forensic odontologists, anthropologists: Prof. Helena Ranta (Finland), Prof. Irena Dawidson (Sweden); Forensic entomologists: Prof. Jens Amendt (Germany), Dr. Martin Hall (Great Britain); Specialist on Distance Education Program in Forensic Science: Prof. Ian R. Tebbett (USA).

177 forensic medicine specialists from 21 country of the world were among the participants of the Congress. 120 presentations, including 46 – oral, 44 – posters presentations have been prepared. In plenary sessions presentations have been made by 9 keynote invited speakers. 8 scientific workshop sessions have been organized during the event, including forensic pathology, DNA, toxicology, continuing professional education, odontology, anthropology, disaster victims’ identification, clinical forensic medicine, bioethics, law, forensic entomology and others.

Prof. Helena Ranta (Finland), Prof. Irena Dawidson (Sweden) presented a program on the mass disasters victims’ identification. Prof. Ian R. Tebbett from University of Florida (USA), Director of Distance Education Program
Fig. 8 The “Catalogus Praelectionum in Caesarea Universitate Vilnensi” 1806-1807.
in Forensic Science, made his presentation on new forms of distant education.

Prof. Michael Thali’s (Switzerland) presentation on peculiarities and possibilities of a new unique investigation method – virtopsy attracted not only participants but also guests’ attention. This method is based on a virtual autopsy, when valuable nonvolatile information is acquired in three-dimensional virtual surroundings without touching the body, by applying the possibilities of a computer tomography and nuclear magnetic resonance. This method involves a perspective of the future world forensic medicine.

President of the International Forensic Medicine Academy Prof. Duarte Nuno Vieira’s welcome speech has been delivered to the participants of the Congress.

A significant fact is that the material of 116 participants’ research works received has been published in the Forensic Science International, Volume 169, Supplement 1, 15th June 2007, ISSN 0379-0738, an international journal dedicated to the applications of medicine and science in the administration of justice [8].

Relevant phenomena of the modern world, such as the threat of global terrorism, increasing international crime rate, drug addiction, people’s migration, etc. are new challenges both to law enforcement and forensic medicine institutions. All these processes encourage forensic medicine specialists to exchange an information and experience in the spheres of application and development of the most recent scientific knowledge and technologies in different forensic medicine spheres, to foresee the main directions and tendencies of development, possibilities of cooperation for solving the recent problems the world has to face.

Taking into consideration all the above factors the International Scientific Committee of the 6th Congress of the Baltic Medico Legal Association has prepared a Resolution – Appeal to: Mr. Franco Frattini, Vice President of the European Commission for Justice, Freedom and Security, Directorate-General for Justice, Freedom and Security of the European Commission, Governments of the Baltic States. The main emphasis of the Resolution is laid on the issue regarding harmonization of the norms, legislation at the European Union level, ensuring the quality standards, mutual support in the solution of global problems. The International Scientific Committee of the Congress has approved this Resolution and signed it.

On June 15 the Forensic Science International Editorial’s meeting was held with participation of members of the Editorial Board – Prof. Pekka Saukko,
Mykolas Romeris University Institute of Forensic Medicine (TMI) participates in the ES 6 FP DRUID (Driving under the Influence of Drugs, Alcohol and Medication) project. During the Congress the TMI DRUID group had a meeting chaired by Dr. Wolfram Hell and Prof. Ludwig von Meyer (Germany). The discussion included issues on the project related activities, i.e. toxicological analyses, culpability studies, etc. [11].

During the closing ceremony of the 6th international Congress of the Baltic Medico Legal Association both the organizers and participants exchanged acknowledgements for a perfectly organized international event, which was characterized by Prof. Erkki Vuori (Finland) as a big challenge for future congresses of the Baltic Medico Legal Association, thus expressing his evaluation of a high scientific and organizational level of this Congress.

Concluding remarks on the scientific program were presented by Dr. Marija Caplinskiene – Congress Secretary General, Vice director for science and development of Mykolas Romeris University Institute of Forensic Medicine.

In his farewell speech President of the 6th Congress of the Baltic Medico Legal Association director of the Institute of Forensic Medicine Dr. Alvydas Pauliukevicius expressed the Congress organizers’ gratitude to the participants of this international event for their common efforts and contribution which enabled to achieve a high scientific level of the Congress work. He also expressed a hope that this Congress will encourage international cooperation and expansion of the Association. In the future medico legal associations of the Baltic States and Scandinavian forensic medicine specialists are likely to join their efforts and activities.

The 7th Congress of the Baltic Medico Legal Association will be held in Helsinki (Finland) in 2010. The authorization regarding the organization of the next Congress has been devolved to Prof. Erkki Vuori from University of Helsinki.

**Current developments**

Institute of Forensic Medicine of Mykolas Romeris University is a research and development institution with expertise in molecular biology, especially in the field of genetic analysis, toxicology, biochemical, spectral analyses and research with a mission to become the leading Eastern European Centre for routine genetic, toxicological, biochemical, spectral analyses under high quality conditions, to develop pioneering services arising from recent
genomic research on polymorphic genetic markers, to become the Eastern European Scientific Research and Education Centre for postdoctoral and Ph.D. students.

The Institute provides the following services: in Forensic genetics: Genetic ID-Identification of living species, populations and individuals using evolutionary genetic tools and population genetics; DNA banking – DNA Lab provides secure storage solutions for biosamples, the new area of service for Pharmacogenetics: identification and analysis of polymorphisms in drug metabolizing enzymes, transporters and targets relevant to unusual drug reaction phenotypes are foreseen. DNA & Serology Lab of the MRU Institute of Forensic Medicine has equipment for genomics analysis: including ABI genetic analyzers, real time PCR and other basic lab equipment. DNA Lab specialists are in preparatory process for participation in DVI (Disaster Victims Identification) and Missing Person Investigation programs; in Forensic toxicology: detection of alcohol and alcohol surrogates in blood, urine, tissues; drugs in urine; post-mortem examinations: drugs, pharmaceuticals, volatiles, pesticides, carboxyhemoglobin, the new service implementation: new drugs (synthetic and semi synthetic) detection in biological tissues was foreseen, new generation immune analyzers for screening methods, confirmation methods as Gas and Liquid chromatography are used, the Toxicology Lab is planning to participate in control of drives for alcohol and psychoactive substances, in testing of anabolics; in Biochemical analysis: perform postmortem blood examinations for glucose, post-mortem organ examinations for glycogen, the new service implementation are foreseen with biochemical blood (serum) analyzer for Glucose, Hb A1c, Methemoglobin (Met-Hb), Urea, Creatinine, KK-MB, Cardiac Troponin-T, GOT, GPT; biochemical urine analyzer for Glucose, proteins in urine, KET; microwave digestion system or similar for digestion of inner organs; in Spectral analysis of metals: determination of metals (K, Na, Mg, Ca, Pb, Zn, Cu, Mn, Ni, Cd, Fe, Ag) in biological samples of alive persons and post-mortem material, the new service implementation are foreseen with new generation Atomic absorption spectrometer for determination of metals (K, Na, Mg, Ca, Pb, Zn, Cu, Mn, Ni, Cd, Fe, Ag); Microwave digestion system for digestion of biological samples (1-5 g per sample).

The Labs of the Institute participate in external quality control and have got certificates of GEDNAP on blind trial for DNA typing in the years 2003, 2004, 2005, 2006. The implementation of LIMS (Laboratory Information Management System) is foreseen in the new Institute in 2008-2009. The vision of the Institute of Forensic Medicine is to get the highest quality values, service accessibility and variety.

258
Mykolas Romeris University Institute of Forensic Medicine is involved in education process and the following Syllabus for the School Year 2007-2008 were developed: on Legal-Social-Medical Aspects of Drugs and Drug Addiction and Preventive Measures; Legal Officers’ Rehabilitation and Stress; Syllabus on Forensic Medicine Studies; Syllabus on Forensic Psychiatrics; Syllabus on the First Medical Aid; Syllabus under the SOCRATES ERASMUS program: Crime and DNA Investigation. New Technologies in DNA Forensics; Forensic Medicine; Forensic medicine aspects of drugs, drug addiction, prostitution and AIDS in Lithuania and East European countries; Forensic Psychiatry; Neurobiology of Human Behavior and Crime Scenes; Stress and Officers of Law and Order; Sustainable Development and Public Health Management.

National/international co-operation

The Institute of Forensic Medicine co-operate with partners in Lithuania: Criminal Investigation Center, Lithuanian Police; Institute of Biotechnology; Kaunas University of Medicine; Legal Investigation Center; National Veterinary Laboratory, the State Food and Veterinary Service; University of Vilnius and partners abroad: Forensic Medicine Investigation Center of the Russian Federation, Forensic Medicine Services of Latvia, Estonia, Belarus, University of Helsinki (Finland), University of München (Germany), University of Münster, Institute of Forensic Medicine (Germany), University of Roma “La Sapienza” (Italy), University of Turku (Finland), Wroclaw Medical Academy (Poland), Zurich Institute of Forensic Medicine (Switzerland), University of Florida (USA).

Discussion questions

During the recent years not only the number of crimes has been increasing but also their type and manner are changing.

That is why the polymorphism and complexity of expertise require searching for the newest methods of investigation the implementation of which could help to better solve problems raised by the legal institutions.

During the investigation of alive persons, while performing toxicological analysis, investigating biological substances many specific questions arise which are little described in the forensic medicine literature or have not been analyzed at all, and the experience of foreign countries in many cases can not be fully applied under the circumstances of Lithuania.
Conclusions

Development of these trends of scientific activities at the Institute will be useful in development of co-operation between different scientific research institutions in the Baltic and other European regions, preparing and submission of common international projects, preparing highly qualified specialists, educating scientific – pedagogical staff. Application of the newest biotechnologies while creating modern methods of medical – biological expertise.

Development and implementation of current tendencies and trends of interdisciplinary approach in Forensic and Legal Medicine Education and Teaching in Lithuania are critically important. The issue on future perspectives in developing the joint degree programs to achieve adequate wide knowledge and practical experience based on the research has to be extended, the future education and continuous training for postgraduates, framework and network of cooperation in education and training process with the Baltic and other European regions have to be foreseen. The framework and network of cooperation has to be foreseen as the degree of progress varies, the gaps should be reduced.

As in the article – Future in forensic medicine as an academic discipline – Focussing on research – Prof. Burkhard Madea and Prof. Pekka Saukko said: “to give future to legal medicine as an academic discipline, research must be given priority over routine casework” [7].

References

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11. http://www.druid-project.eu/