FEDERAL STATE AUTONOMOUS EDUCATIONAL
INSTITUTION OF HIGHER EDUCATION
"PIROGOV RUSSIAN NATIONAL RESEARCH MEDICAL
UNIVERSITY" OF THE MINISTRY OF HEALTH
OF THE RUSSIAN FEDERATION

The Department of Forensic Medicine

GUIDELINES ON FORENSIC MEDICINE. PARTICIPATION OF A DOCTOR IN THE EXTERNAL EXAMINATION OF A CORPSE IN THE PLACE OF DISCOVERY (CRIME SCENE)

Study guide

Edited by I.V. Buromsky and E.M. Kildyushov

Translated from Russian by E.V. Egorova

Moscow
2020

FEDERAL STATE AUTONOMOUS EDUCATIONAL
INSTITUTION OF HIGHER EDUCATION
"PIROGOV RUSSIAN NATIONAL RESEARCH MEDICAL
UNIVERSITY" OF THE MINISTRY OF HEALTH
OF THE RUSSIAN FEDERATION

The Department of Forensic Medicine

GUIDELINES ON FORENSIC MEDICINE. PARTICIPATION OF A DOCTOR IN THE EXTERNAL EXAMINATION OF A CORPSE IN THE PLACE OF DISCOVERY (CRIME SCENE)

Study guide

Edited by I.V. Buromsky and E.M. Kildyushov

Translated from Russian by E.V. Egorova

Recommended by the Central Coordination Board of Federal State Autonomous Educational Institution of Higher Education "Pirogov Russian National Research Medical University" of the Ministry of Healthcare of the Russian Federation

Moscow
2020

UDC 340.6;616.091.8(075.8)=111

Authors:

I.V. Buromsky, Yu.V. Ermakova, *N.N. Kachina*, *E.M. Kildyushov*, *P.V. Pinchuk*, *E.S. Sidorenko*, *Z.Yu. Sokolova*, *E.V. Tumanov*

Reviewers:

A.Yu. Vavilov — M.D., dean of the Department of General Medicine of Izhevsk State Medical Academy, head of the Forensic Medicine Department

Yu.I. Pigolkin — associate member of the Russian Academy of Sciences, professor, head of the Forensic Medicine Department, I.M. Sechenov First Moscow State Medical University

Translation of the publication:

ПРАКТИКУМ ПО МЕДИЦИНЕ.
УЧАСТИЕ ВРАЧА В НАРУЖНОМ ОСМОТРЕ ТРУПА
НА МЕСТЕ ЕГО ОБНАРУЖЕНИЯ (МЕСТЕ ПРОИШЕСТВИЯ)

Под ред. И.В. Буромского, Е.М. Кильдюшева
Москва
"Светлица"
2018

Guidelines on Forensic Medicine. Participation of a doctor in the external examination of a corpse in the place of discovery (crime scene) : study guide / I.V. Buromsky, Yu.V. Ermakova, N.N. Kachina, [et al.]; ed. by I.V. Buromsky, E.M. Kildyushov ; transl. from russ. by E.V. Egorova ; Pirogov Russ. Nat. Research Med. Univ., The Dep. of Forensic Medicine. — Moscow : PRNRMU, 2020. — 48 p.

ISBN 978-5-88458-510-2

This study guide is written in accordance with the federal educational standard of higher professional training for the degree (specialty) 31.05.01 General Medicine, approved by the Ministry of Education and Science of the Russian Federation on February 9, 2016, N 95, and degree (specialty) 31.05.02 Pediatrics, approved by the Ministry of Education and Science of the Russian Federation on August 17, 2015, N 853. The guidelines are intended for students as a study guide for preparation for practical trainings and independent work.

ISBN 978-5-88458-510-2

UDC 340.6;616.091.8(075.8)=111

CONTENTS

Contents of the Program Section

Medical and juridical aspects of pronouncement of death and of determination of causes of death.

Procedure of corpse examination in the place of discovery (crime scene), procedural and organizational forms of participation of a doctor. Distinctive features of corpse examination in the place of discovery (crime scene) depending on the type of death. Distinctive features of corpse examination of a newborn, of an unidentified person, of a putrefactive, fragmented, and skeletonized body, and in the cases of mass fatality.

Study methodology and expert judgement of supravital reactions, early and late postmortem changes, destruction of corpse by animals, insects and plants.

Methodology of approximate determination of causes and time of death, mechanism, time and sequence of causing injuries, intravitam (postmortem) injury appearance, the possibility of causing the injury to oneself, the injured person's capability of purposeful actions after the inflicted trauma. The determination of the most probable position and pose of the victim at the moment of injury, changes of initial pose and position of the corpse.

Methodology of detection, description, withdrawal and packing of traces and evidence of biological origin.

Requirements for Volume and Level of Knowledge Acquisition of the Program Section

The volume and level of knowledge acquired from the program section is intended to form soft skills, general and special professional skills (acquirement of knowledge, skills and competence). Such skills allow doctors involved in investigative activities to cooperate with representatives of law enforcement agencies in the detection, withdrawal and recording of traces of crime, as well as in the formulation of questions subject to determination by experts.

The criteria for acquiring the necessary scope of knowledge and achievement of the necessary level of knowledge are the following:

Gaining insight into:

- the principles, structure and organization of the work of the forensic agency in the Russian Federation and the work of subdivisions of the

Office of the Chief Medical Examiner in the examination of the corpse in the place of discovery (crime scene).

Acquisition of knowledge of:

- juridical and medical aspects of pronouncement of death, determination of causes of death and its connection with precedent events;
- the procedure and the methodology of examination of a corpse in the place of discovery (crime scene), the distinctive features of the procedure depending on the type of death;
- the ways and methodology of detection of evidence of biological origin, the rules of its withdrawal, packing and forwarding to subsequent forensic examination.
- the mechanism and distinctive features of injuries in the cases of different external influences on a person, severe conditions and pathologic processes;
- the techniques and methods of inspecting the object of forensic tests, their diagnostic features, structural divisions of the forensic agency in which the tests may be carried out;
- the principles of handling the results of laboratory reports of objects of forensic tests.

Development of skills:

- critical analysis and assessment of information contained in medical documents;
- logical and well-argued presentation and defense of one's point of view, in particular, in the case of participation of a doctor as an expert or specialist in legal proceedings;
- cooperation with representatives of law enforcement agencies in formulating the questions subject to determination via forensic medical examination and consultation (when necessary) within the range of special knowledge.

Acquisition of expertise in:

- system oriented expert analysis of circumstances of the incident, medical documentation and health-related information in the case materials;
- description of *pathomorphological changes* and injuries, approximate decision on matters of intravitam (postmortem) appearance of injuries, time, order and mechanisms of their appearance, capability of a human to perform purposeful actions after such injuries or development of pathologic condition;
- description of postmortem changes and approximate determination of time of death.

Basic knowledge necessary for studying the Program Section:

- basic knowledge of general and pathologic anatomy; topographic anatomy and operative surgery; general and pathological physiology; traumatology and orthopedics.

Objectives of Practical Training:

1. Correcting and organizing the knowledge acquired during individual preparation for the lesson in accordance with the requirements set forth above.

2. Mastering the description and assessment of postmortem changes and supravital reactions, exercising approximate judgement regarding time of death.

3. Learning to detect, record and collect evidence of biological origin from objects in the environment.

4. Learning to assess the results of the examination to the extent necessary for the successful performance of duties by the doctor-specialist during investigative activities, such as the examination of a corpse in the place of discovery (crime scene).

Procedure for the conduct of practical training

The objective of the practical training is achieved during the student-teacher discussion of questions which arise in the course of individual preparation for the lesson; during the introductory visit to the Bureau of Forensic Medicine with the purpose of attending a postmortem examination; familiarization with the collection of diagrams and charts; solution of a case problem including the determination of death time.

The control of the original level of knowledge (preparation for the lesson) is conducted by carrying out tests (expected to be passed with the score of 70% and higher).

The control of achievement of the required level of knowledge as a result of the practical training (final control) is conducted by fulfilling the following: solving tests (expected to be passed with the score of 70% and higher), solving a case problem and subsequent conversation with a teacher within the spectrum of the study material of the Program Section.

Methodology Instructions to Practical Training

The procedure and sequence of the investigation of place of incident (including the corpse examination) is regulated by the Criminal Procedure Code of the Russian Federation and the Procedure of organization

and carrying out forensic examination in state forensic authorities of the Russian Federation (approved of by Order of the Ministry of Healthcare and Social Development of the Russian Federation dated May 12, 2010 N 346n).

In accordance with Article 73 of the Criminal Procedure Code the first fact subject to establishment is the event of crime (time, place, method and other circumstances of the committed crime). Well-timed and appropriate conduction and recording of the examination of the place of incident is of exceptional importance for the crime investigation and is considered as a source of evidence under Article 74 of the Criminal Procedure Code.

Objectives of the Examination of the Crime Scene

The examination of a corpse in the place of discovery (crime scene) refers to urgent investigative measures aimed at: examining the crime scene; detecting, recording and collecting different traces and other material evidence in order to find out the nature of the incident; figuring out the environment of the incident and other circumstances subject to determination.

Organization of the Examination of the Crime Scene

Being reported about an incident, an investigator has to ascertain the circumstances of the incident, give orders to safeguard the crime scene, call the necessary experts and drive out to the place of incident.

In accordance with the law the investigation officer records the actual findings at the crime scene in a protocol.

The investigation officer ascertains the boundaries of the crime scene, the sequence of examination, resolves other issues, and decides on the methods and techniques of the examination.

After the general examination of the crime scene investigators usually take orienting and lookthrough photos, record the start time of the examination in the protocol.

Participants of the Examination of the Crime Scene

The examination of the crime scene and the corpse in the place of discovery is carried out by the investigator, therefore other participants of the inspection are obliged to follow his/her directions and act with permission of the investigation officer.

During the examination the investigation officer explores the main circumstances of the incident, because this information is needed to adequately form the crime scene investigation team.

Under Articles 170 and 177 of the Criminal Procedure Code any investigative measure, including the examination of the crime scene and the corpse in the place of discovery, is conducted in the presence of two attesting witnesses. The two attesting witnesses are supposed to stay close to the person conducting the examination and personally perceive everything that is detected, inspected, recorded and withdrawn during the investigation. Any person that has no personal interest in the case and is not involved in it may be an attesting witness.

In some cases described in the law it is possible to involve a specialist (i. e. a person possessing special knowledge) into the investigation for rendering assistance in the detection, confirmation and collection of objects and documents, and in the application of technical devices in the study of the criminal case materials, for formulating questions to the expert and also for the explanation of issues embraced by his/her professional competence to the parties and to the court (Article 58 of the Criminal Procedure Code).

The specialist involved in the examination of a corpse, the exhumation, the medical examination of a persons, collecting blood, hair, excretions for subsequent testing in a crime re-enactment, in an interrogation, search and seizure can be a forensic expert (a doctor with special training and a degree in "Forensic medicine", who is a member of staff in an expert institution, department of forensic medicine in a higher educational institution) or any other doctor, in cases when a forensic expert's presence is impossible. Both are equal in rights and are equally liable.

The specialist shall have the right to:

- refuse to take part in the procedure on the criminal case, if he/she does not possess the corresponding special knowledge;
- ask the participants in the investigative action questions with the permission of the inquirer, the investigator or the court;

- get acquainted with the record of the investigative action, in which he/she has taken part, and to make statements and comments that shall be entered into the record;
- file complaints against the actions (lack of action) and decisions of the inquirer, the investigator or the prosecutor or the court, restricting his rights.

The specialist is liable under Article 310 of the Criminal Code of the Russian Federation for the disclosure of information of preliminary investigation which he/she found out in the capacity of a specialist in cases, when he/she was warned in advance of the inadmissibility of disclosure. Such information may be made public with the permission of the inquirer, the investigator, and only in a specific volume.

The specialist is subject to recusal if:

- he/she is the victim, civil claimant, civil defendant or witness in the given criminal case;
- he/she has participated as a juror, expert, specialist, interpreter, attesting witness, secretary of the court session, counsel for the defense or legal representative of the suspect or of the accused, representative of the victim, of the civil claimant or of the civil defendant;
- he/she is a close relative or has a relation with anyone of the participants in the proceedings in the given criminal case;
- he/she has been or is in the official or in the other kind of dependence upon the parties or upon their representatives;
- his/her incompetence is exposed;
- other circumstances that hint on the direct and indirect interest of the specialist in the given case are revealed.

The decision on the recusal of a specialist is made by the inquirer, the investigator, the court or the presiding judge in the jury.

The doctor who takes part in the examination of the corpse in the place of discovery is not considered to be an expert in the meaning of the Criminal Procedure Code, therefore he/she does not have the rights and duties of an expert (although he/she may be a forensic doctor). He/she is considered a specialist. The doctor's opinion and explanation at place of incident are not a conclusion; they are of advisory character in oral form. The doctor conducting the examination of the corpse in the place of discovery may subsequently conduct forensic tests of the corpse and give a written opinion in the capacity of a specialist.

The investigator often invites other specialists, such as intelligence officers, forensic analyst, detector dog handler with a dog and others.

All participants of the examination are to act in a way that will not change the environment of the place of incident and the traces of crime will not be damaged until their detail recording.

Participation of a Doctor as a Specialist in the Examination of a Corpse in the Place of Discovery (Crime Scene)

Aims of a forensic expert or any other doctor during the examination of a corpse in the place of discovery (crime scene)

The external examination of a corpse in the place of discovery is an obligatory investigative action, a part of the examination of the crime scene.

The arrival of a forensic medical expert (doctor) to the place of discovery of the corpse and the departure is administered by the authorities conducting the examination of the place of incident. These authorities also provide the necessary conditions of work for the specialists (lighting, security, *etc*.).

The external examination of a corpse in the place of discovery (crime scene) starts with answering the question: "Is the person dead?".

The determination of time of death is regulated by Article 66 of the Federal Law dated November 21, 2011 N 323-FZ "The fundamentals of health care of citizens in the Russian Federation" and the "Rules of determining the time of death, including the use of the criteria and procedures of determination" (Russian Federation Government Regulation dated September 20, 2012 N 950).

In the place of discovery, if the former's presence is impossible, the forensic medical expert or another doctor must:

- make certain of the definite signs of death: postmortem lividity (livor mortis), rigidity (rigor mortis), Beloglazov sign, drying of keratoderma and sclera, decrease of body temperature lower than +20°C, late postmortem changes (if the signs of death are not evident, the doctor must ask the investigators to call an ambulance; until the arrival of the ambulance the doctor must conduct paramedical first aid — these actions must be recorded in the investigation protocols);
- find out the information that will allow to judge about the time of death, type and mechanisms of injury appearance, other information that is of use for the investigative actions;

- give the investigator a consultation on the issues connected with the external examination of the corpse in the place of discovery and the subsequent forensic test (help with drafting the act of commissioning of forensic expert studies and formulating questions the expert may be asked);
- render assistance to the investigator in the detection and collection of traces that look like blood, semen and other excretions, hair and objects, weapons and other things;
- help to describe the results of the external examination of the corpse and evidence of biological origin;
- express a preliminary opinion (in oral form) on the nature, mechanisms and time of the injuries found, on the instrument used to injure, and on other issues of medical nature that arise in the process;
- draw the attention of the investigator to the peculiarities that may be of importance in the given case and give explanations about the actions conducted by the doctor.

Types of examination of a copse in the place of discovery (crime scene)

The initial external examination of a corpse in the place of discovery (crime scene) might be conducted in poor conditions (insufficient lighting, heavy rain, *etc*.). If the examination is declared nonsufficient, the examination may be conducted once again (a follow-up examination). If new information about the events in the place of incident is received during the investigation, and there is an opportunity to find new formerly not collected evidence and traces, a secondary examination is conducted.

In such cases the forensic medical expert or another doctor may be invited as specialists for the follow-up examination or the secondary examination of a corpse in the place of discovery (crime scene) as part of a preliminary investigation or trial.

The stages of examination of a corpse in the place of discovery (crime scene)

The examination of a corpse in the place of discovery is divided into static and dynamic stages.

The static stage includes the examination and description of the location of the corpse, position of its moving parts, objects on the corpse and its outdoor clothing. Therefore, it is prohibited to move, remove and change the objects of examination.

It is necessary to describe and take photos of the corpse (as well as of the whole crime scene) in the same form that it was found at the moment of examination (Art. 180 of the Criminal Procedure Code). It is not allowed to reconstruct anything in the place of examination, including the location and position of the corpse, even if it is established that something had been changed before the arrival of the investigator and the doctor.

The dynamic stage of the examination of the corpse in the place of discovery (is followed by repositioning of the corpse) includes continuous examination and description of the position of the corpse and everything that is on the body, such as clothing and shoes, the postmortem changes and damages, distinctive features of body parts.

The procedure of examination of a corpse in the place of discovery (crime scene)

The description of the corpse is to be conducted in a way, so that in the future, if necessary, it would be possible to reconstruct the scenery of the place of incident.

Recommended plan of examination of a corpse in the place of discovery:

- position and pose of the corpse;
- objects on the corpse and close to it;
- clothing and shoes;
- general information about the corpse;
- existence and intensity of postmortem changes, signs of tissue ageing;
- examination and description of separate parts of the corpse and the injuries;
- examination and description of the bed.

The position and the pose of a corpse

In the process of examination, the exact name of the place and the specific part of the place, where the corpse was found, must be designated. For example, when the corpse was found on the street of a city, the name of the city, the street and number of the closest building must be indicated in the protocol of investigation. The position of the corpse is determined in terms of the surrounding objects; furthermore, the investigator must use orienteers of the location which cannot be altered in the near future (a tree, a house, a window, *etc*.). In the process of recording the position of the corpse it is obligatory to make measurements

between parts of the body (usually between the head and limbs) and the chosen orienteers. If the corpse is found on an open territory without any specific orienteers, the position of the corpse is described in relation to compass points (North, South, East, West).

The pose of a corpse is considered to be the relative position of the body parts between each other. The description of the pose includes the following aspects: position of head relative to the median body line (tilted to the right, to the left), to the sagittal plane surface (turned to the right, to the left) and the frontal plane surface (bended down, reclined). Then the position of the head is described in relation to other body parts (chin lying on the breast, *etc*.). The description of the limbs includes the description of their position on the whole and separate segments relative to the sagittal and frontal plane surfaces (abducted to the right, to the left, to the back, to the front, under what angle), as well as the following criteria: bended or extended limbs (in which joints, under what angle), the contact to other body parts. During the description of the upper limbs it is necessary to note the position of the fingers relative to the palms of hands (slightly bended, fist, extended).

The description of the corpse is to be conducted in a way, so that in the future, if necessary, it would be possible to reconstruct the scenery of the place of incident.

In some cases, the position and pose of the corpse may indicate the circumstances of the criminal or non-criminal incident. That is why it is important to keep in mind that the criminal may put the corpse in a certain position or pose on purpose.

Objects on a corpse and in the immediate surroundings next to a corpse

At this stage the expert describes only those objects that are lying on the corpse itself or are in contact with it, particularly objects (weapon, tool, object) that may have been the cause of injury. Some objects may be directly in the body (a gag in the mouth, a knife in a wound, *etc*.). It is prohibited to take out such objects. All the knots on a rope, shoelaces, *etc*. that are found at the crime scene and that are related to the incident must be preserved. Some objects may be fixed in the hand of the corpse (a knife, a gun, a wisp of hair, *etc*.). These objects must be closely examined, recorded and collected.

It is not uncommon that traces of blood, urine, vomit mass, brain matter are found near the corpse. It is necessary to describe their position

relative to a specific part of the body, the color, the form and the size of such traces.

Clothing and shoes

The description of the clothing of the corpse is conducted in a specific order: from top to bottom, from outside to inside. It is strongly forbidden to take off any garments of clothing, only unzipping, uplifting and lowering of clothing is allowed (all actions must be recorded in the protocol).

In the process of clothing examination the following should be noted: the clothing's appropriateness for the season, time of day and surroundings; the state of the corpse (neat or turmoil); which garments are moved from their ordinary location (lowered, lifted, folded, *etc*.); is the clothing buttoned or unbuttoned, are the buttons, clothes hooks and button holes whole, is the belt buckled, are the pockets turned out; the odor from the clothing (gas, urine, *etc*.).

It is reasonable to describe the clothing in the following sequence:

- garment of clothing (coat, dress, shirt, pants);
- type of fabric (cotton, wool);
- colour and print on fabric (blue, red, floral ornament);
- extent of wear (new, prolonged wearing);
- odor coming from the clothing (vanilla, acetone);
- the state of fastenings (zipped, unzipped);
- soiling and damages (clean, mudded);
- contents of pockets (candy, keys);
- brands of merchandise, marking, lettering that can be used to establish the identity of the body of the unknown.

If any damages or soiling are found on the clothing, shoes and headwear, they must be recorded with the indication of their location (using the ordinary names of clothing garments and shoes), form, size, distance from seams and other orienteers (details) on the clothing (pockets, flaps, rim of breast, *etc*.). Other distinctive features must be described (flattening, rubbing out, ironing, wrinkling, soaking, overlapping). The interposition of damages and soiling on the clothing with the injuries (traces) on the corpse are established. The damages and soiling are measured and photographed (with a scale-size indicator).

If tears, cuts, defects, traces of slipping or other damages and distinctive traces (tread footprints, application of greasing (lubricant),

particles of paint, smudge, *etc*.) as well as traces looking like blood, vomit mass, medicine or other chemical matters are found, the forensic medical expert is to take measures to preserve the detected damages, soiling, soaking and overlapping for the subsequent examination by experts in other fields and for the prevention creating additional damages, soiling and deformation of present traces.

During the examination of shoes, it is necessary to pay attention to the sole. The sole may have traces of sliding (road incident) or may lack any traces from the crime scene (paint, lime, *etc*.), which will point to the fact that the place of discovery is not the place of incident.

General information about a corpse

General information about a corpse includes the full name and year of birth of the deceased (in lack of such data a descriptive (verbal) portrait is made that helps to conduct identification); anatomical and statical data; gender, age (in plain view), length of body; bodily structure, fatness, skin color; distinctive features.

The presence and intensity of the postmortem changes, signs of tissue ageing (supravital reactions)

The description of postmortem changes and supravital reactions in the report starts with the indication of time (in hours and minutes) of the recording and the temperature of the surroundings (air, water).

Body cooling

The level of cooling is established by palpating open areas of the body, clothed areas and contiguous parts of the body (warm, cool, cold), as well as by temperature measurement. Before measuring the rectal temperature of the corpse it is necessary to first measure the temperature of the surroundings by putting the thermometer on the surface on which the corpse is lying. In order to measure the rectal temperature, it is necessary to insert the thermometer into the rectum at a depth of minimum 10 cm (5,5 cm for the corpse of newborns), wait some time and record the primary result. It is compulsory to measure the rectal temperature at least twice (the repeated measurement is preferably conducted in an hour after the first measurement). If there are assumptions that there was a penis penetration in the rectum, it is necessary to take a smear of the rectum before the temperature measurement.

Postmortem lividity

The following results of the examination must be described in the report: location of postmortem lividity, nature (diffused, local), the colour, discoloration under pressure (disappear, become pale, don't change in colour), the time necessary to recover the colour of postmortem lividity (in minutes and seconds).

It is necessary to press on the lividity for 3 seconds with a dynamometer, perpendicular to the body surface on an area of 1 cm^2 with a constant magnitude of 2 kg/cm^2 or with a finger. If the postmortem lividity is located on the back of the corpse the dynamometer is mounted in the center of the lumbar region, on the front — on the breastbone. If the lividity is found on both body surfaces (this takes place in cases of alteration of corpse position), it is necessary to conduct dynamometry on both body surfaces (indicate the separate results in the protocol).

Rigidity (rigor mortis)

The rigidity is established in the masticatory muscles, cervical muscles and lower limbs by the palpation of the muscle groups, abduction of the mandible, bending and extension of the neck and limbs in the joints. The level of intensity of rigidity in different muscle groups is noted (poor, moderate, well-defined), as well as the lack of expressiveness of rigidity.

The forensic medical expert must identify dry areas of the skin in the zones of intravitam and postmortem mechanical damages and areas of skin compression (parchment stains), as well as their localization (usually in protruding parts of the body in compliance with subjacent bone), form, size, intensity of boundaries, level of distribution (extruding, retracting) as related to the surrounding intact skin. It is necessary to ascertain the corneal opacity (black spots of the sclerae), drying up of the skin on the fingertips, on the vermilion border, on the thin skin (scrotum, vulvar lips), intertrigos areas and others. The presence (or absence) of the Beloglazov sign is established (alteration of the pupil form when pressing on the eye-ball).

In the existence of late postmortem changes, such as putrefaction, the expert must pay attention to the following: the odor of the corpse, intensity of corpse greening, putrefactive venation on skin, putrefactive vesications, putrefactive emphysema (necessary to note the localization, colour, size, form); emergence of the tongue, rectum and uterus. In cases of adipocere the expert must describe the existence of adipocere areas, their odor, localization, consistence, colour and preservation of tissue around.

The signs of mummification (extent of drying up of the corpse, skin colour, density, sound after tapping the skin, decrease in size and weight of the corpse) or peat hardening [bog body] (skin colour, skin density, decrease in corpse size) are established. It is reasonable to collect the maggots and caseworms found on the corpse, put them in a test tube and refer to entomologic analysis. The expert indicates the localization, colour, height, size of mold (fungus) spots on the skin and clothing of the corpse and carefully takes it off via sterile forceps and also puts it in a test tube (for the laboratorial determination of development time).

In order to establish *the supravital reactions*, it is necessary to conduct a pupillary test, mechanical irritation of shoulder and hip muscles, electric stimulation of skeletal muscles.

The pupillary test constitutes a reaction of the pupil to the administration of atropine and pilocarpine in the anterior eye (aqueous chamber). For this purpose, 0,1 ml of 1% solution of pilocarpine hydrochloride is administered in one eye and 0,1 ml of 1% solution of atropine sulphate in the other. The injection is administered a distance away from the cornea in the corner of the eye, the expert must hold the eyeball from the opposite side with his finger or forceps. The syringe needle is supposed to be parallel to the iris. The solution is slowly administered (2–3 drops) when the syringe needle is in the middle of the pupil. The expert has to indicate the starting time of the pupil reaction (contraction, dilatation) with a timer. It is possible to conduct both tests on one eye in a successive order.

The mechanical irritation of skeletal muscles is tested by abducting the arm of the corpse to the side at an angle of no more than 45° and striking the anterior surface of the biceps of the arm with a metal object (metal core, metal plate). The response may differ: a visible muscle contraction (idiomuscular contraction); unobservable, but palpable protuberance under the skin; lack of protuberance and appearance of an indention in the area of impact. In the first two cases the response is considered positive, in the third case — negative. The height of a protuberance is measured. If for any reason the expert cannot use the area of the shoulder to conduct the test, he/she may use the anterior surface of the thigh.

A special portative direct-current power supply and two electrodes in the form of needles are necessary for the electric stimulation of skeletal and facial muscles. The electrodes are injected into the corners of the eyes, lips and into upper and lower limbs (in the anterior surface of the thigh in the lower third, in the dorsum of the foot, in the exterior surface

of the shoulder joint, in the back of the hand) The test is assessed by the response of muscles and its intensity (contractions, fibrillary tremor).

The examination report must contain all the conducted tests and their results.

The examination and description of separate body parts and injuries

In order to examine the head, it is necessary to take off all headwear (if any), point out the condition and color of hair, its soiling, existence of head injuries (of the scalp), integrity of skull bones.

During the description of the face, it is necessary to specify the skin colour (pale, blue with ecchymosis), existence of puffiness, state of eyes (eyelids, conjunctiva, cornea, pupils), state of nose (integrity of bones and cartilages, existence of any contents in nasal passages and nostrils), state of auricle and ear tract (if any contents are found, their nature, amount, color, draining and direction of flow are noted). The description of the mouth must contain the following aspects: state of the mouth (open, closed), distinctive features of the vermillion, mucous membrane of the oral vestibule and oral cavity, tooth loss and state of teeth, alveolar sockets of missing teeth, position of tongue (behind teeth, tip clamped between teeth, tongue out of mouth).

In the process of examination of the neck it is reasonable to unbutton the shirt (coat). The form of the neck, the existence or lack of injury are noted. The anterior, exterior and side surfaces of the neck are sequentially examined and described.

During the examination of the thorax, it is necessary to describe its shape (cylindrical, conical, barrel-like) and to establish the integrity of the ribs by touch. The anterior and exterior surfaces of the thorax are examined. The state of the mammary gland is examined in female corpses.

The examination of the stomach includes the assessment of its configuration, sizes (the level of the costal margin, above and below) and consistency.

During the examination of the external sex organs, it is necessary to note the correctness of their development, the existence of excretion in the urethra and vagina.

Before inserting the thermometer in the rectum, it is necessary to note the state of the rectum (closed, incompletely closed, extent of opening) and the nature of excretions (if any).

During the examination of limbs, the expert establishes the integrity of bones by touch (existence of flail mobility, bony crepitus), describes the nails, state of skin on the palms of the hands and the soles (soiling, deposition, signs of maceration).

It is advisable that any injuries found on the corpse are described in the process of examination of separate body parts (head, neck, thorax, stomach, groin, limbs). During the examination of injuries, it is forbidden to change the original appearance of the injuries (for example, washing) in order to avoid the loss of possible material evidence.

The examination and description of corpse's bed

The bed of the corpse (outline on the surface where the corpse was found) is examined and described after the careful displacement of the dead body from the place of its initial position.

Three areas of the bed are distinguished:

- bed itself (the surface which was in direct contact with the corpse);
- projected area (the area limited by the protection of the corpse silhouette);
- area of corpse excrements (the area in which are secretory products and products of decomposition).

In the process of description of the bed, it is necessary to note the nature of surface (wooden floor, soft snow), existence of body imprint on the surface, soiling and any objects under the corpse. If any blood stains are found under the body, it is necessary to identify the exploration depth into the material of the bed (for example, base coat, snow).

Sometimes drag marks in the form of strips of different shape, width and depth are found in the surroundings of the bed. The investigator describes the drag marks, the forensic medical expert renders assistance in case blood is found in the drag marks.

Detection and Collection of Evidence of Biological Origin in the Place of Discovery

One of the objectives of the forensic medical expert involved in the examination of the place of discovery is the detection and collection of evidence of biological origin for analysis.

Since biologically sourced traces have certain distinctive features (nature and mechanism of appearance), it is important to correctly detect, collect, pack them and refer to forensic tests.

The detection of evidence of biological origin during the examination may often be difficult. This is due to the polymorphism and conditions of appearance of injuries (type of instrument that caused the injury, event mechanism, *etc*.). Often evidence of biological origin is mixed with material evidence of other nature (for example, with clothing damages and traces of oil and paint).

The object on which the biological sample is found (hair, blood traces, semen, saliva) is defined as a carrier object. After the necessary legal arrangements such an object becomes evidence and can be examined in a forensic medical laboratory.

During the examination of the place of discovery of biological evidence the expert detects and collects samples that look like traces of blood or excretions (stains of semen, saliva, urine), as well as hair or similar looking objects.

Traces of blood

The detection, correct description and collection of blood traces is of utmost importance during the examination of place of discovery.

Forensic medicine and criminology consider traces of blood as any amount of blood outside the human body despite its state.

During the examination of blood stains in the crime scene the expert can acquire a lot of information about the mechanisms of its appearance, conditions in which the blood stains appeared, time of appearance.

The traces may appear as a result of blood spreading with the formation of drops, stains and pools of blood; blood dripping (drops, blood splatter), contact with bloodstained objects (marks, prints or the combination of both).

Pools of blood are created in the result of excessive bleeding, mainly in cases of trauma of large blood vessels or of body parts with a developed vasculature, when the blood spreads on a non-absorbent or poor absorbent not sloped surface.

The size of the pool of blood is determined by the diameter of the injured vessel, the time of bleeding and coagulability. The angle of slope of the object on which the blood was leaking, the form of the deepening on the object, the height of the source and time of bleeding, as well as physical impact and transportation of the victim affect the size of the pool of blood.

Pools of blood may be found in the exact place of injury infliction, as well as in another place, where the victim or corpse were transferred.

Lack of blood (or the inadequacy of the amount of blood to the diameter of the injured vessel) at place of discovery of the corpse in cases when inflicted injuries are usually followed by excessive bleeding can mean that the place of discovery is not the crime scene.

With the course of time, liquid blood that makes it out on a surface coagulates and dries up.

In the process of examination of the pool of blood it is necessary to measure its area and thickness in the center and in some periphery places. It is necessary to identify the state of blood (liquid, coagulated), and in cases of blood clots — to note the width and thickness of the blood serum border and the clot (measure in several places). In the description of a blood clot it is necessary to pay attention to the state of its surface (shiny or dry), specify the presence or absence of damages on clot. It is important to describe the objects that are in contact with the pool of blood or are lying directly in it, to list which of the objects and at what side of the pool they contact with the blood (household appliances, clothing of the victim, *etc*.), note the presence or absence of footprints.

The value of pools of blood for the investigative practice:

- point to the place of injury infliction;
- allow to make conclusions about the transfer and dislocation of the victim, answer the question about the height of the source of bleeding, identify the time of bleeding (based on the coagulation and amount of blood serum).

Blood-soaking marks are formed on porous surfaces (for example, soil, snow) and create saturation areas of blood on absorbent materials. The diameter of the injured vessel, the amount of blood and the porosity of the material determine the sizes of saturation areas. Blood-soaked areas can be found on soft ground, on textile and other porous materials that are on the victim or are in contact with pools of blood or the source of bleeding. Blood-soaked areas do not have distinct geometric shape, since they can spread in all directions, including bottom upwards. It is usually possible to identify the direction of the blood oozing by analyzing the location of blood crust and level of soaking of different layers of multiple fabric. Such information is sometimes helpful in establishing the position and pose of the victim.

The value of blood-soaking marks for the investigative practice:

- allow to establish the initial interposition of fabric layers and details, state of wrinkles and clothing fastening, position and pose of the victim;

- allow to make conclusions about the method of packing, about the use of absorbent materials as underlay, about the amount of effused blood.

Blood flows are defined as the trace which is left by blood flowing on a vertical or horizontal surface. Blood flows in the place of incident can be found practically everywhere: on the body, clothing, and shoes of the victim and the assaulter, on the walls, the floor, objects of the surroundings or house appliances, weapons.

The amount of blood on the object, the angle of slope, and alteration of the position of the victim or the corpse determine the size and shape of the blood flow. When a blood droplet strikes a surface, it first has the form of a sphere. Then with the pull of gravity it starts to move downwards, losing particles on the way and leaving a stripe-like trace. The movement of the drop stops when the action of gravity of the blood droplet is balanced by the surface tension force. A claviform shaped buildup of blood in the bottom part of the stain is created. On even surfaces blood flows have the form of straight lines, on uneven surfaces — the form of twisty lines. The surface, on which a blood stain can form, can be inclined or plumb, absorbent or non-absorbent, even or uneven. Sometimes blood stains can create a leak.

When describing blood stains, it is necessary to specify their amount, shape and size of the upper part, the length, width and direction of each (individual and intersecting) blood flow. It is important to note the following: buildup of blood in the bottom end; the angle and level of blood stain intersections; the side of the buildup of blood of the intersecting glows; the state of blood (fluid or dry) which formed the blood stain.

The value of blood stains for the investigative practice:

- allow to identify the position of the body after the bleeding started and to reconstruct the original position of surrounding objects, the interposition of objects and the victim, the pose of the victim, the order of injury infliction, time of bleeding;
- allow to make conclusions about the transfer of the victim and dislocation of the corpse, about the initial position of the objects (if there are assumptions about the transfer of objects), about the height of the source of bleeding.

A blood leak is defined as the diffusion of blood inside gaps between two surfaces. The size of a blood leak is determined by the amount of effused blood, the distance between the surfaces that create a gap, their smoothness, surface tension force and the surface slope.

Blood leaks are created when fluid blood from pools flows on two closely situated surfaces and the surface tension force pulls the blood into the gap between the surfaces. The blood can spread in the gap in two directions: from the top downwards and from the bottom upwards.

It is necessary to note the state of the blood (fluid, coagulated, with separated blood serum, dried up, altered) in the gap, and whether the blood leak is connected with a pool of blood or blood stain.

The value of blood leaks for the investigative practice:

- allow to differentiate the place of incident from the place of discovery in cases when there is a lack of blood traces and corpse at the crime scene.

A drop is a strictly determined amount of liquid that has a circular shape. This shape is formed as a result of the coalescence of particles, which are held together by the surface tension force. The moment when the weight of the liquid exceeds the surface tension force on the drop's perimeter, the liquid under the force of gravity becomes spherical, tears away and falls down.

When the liquid free-falls on a horizontal surface, it creates a trace in circular shape, on an angled surface — an elongated form with a pointed end which indicates its direction of travel. If the distance of travel and the angle of slope of the surface are increased and the collecting surface is rough and non-absorbent, then the border of the trace will have the form of serrated edges ("facets"), rays and secondary splashes in the direction of the slope.

The value of drops for the investigative practice:

- allow to establish the distance of fall and its mechanism.

A blood spatter is defined as drops of liquid that received additional kinetic energy as a result of the prevailing action of inertia force and affiliated action of gravity force. Under inertia force a blood drop tears away and falls fast with high velocity. This leads to the drop breaking with the appearance of a spatter, which descends on the surface under gravity force.

A blood spatter can be created by the blood gushing from injured arteries, by the shaking and waving of a bloodstained object or hands, by the impact with a pool of blood. Even blood spatters that were formed simultaneously usually have different sizes. This is due to the fact that spatters tear away from different parts of the drop surface and with different velocity; they undergo different atmospheric resistance in the center and on the periphery of the group; some of them break up during

the fall as a result of percussion. The size of a spatter is always smaller than that of a drop which is torn away from the same object. It is necessary to look for a spatter with the help of a magnifying glass in sufficient artificial lighting, since the diameter of a splash might be smaller than a typographic dot.

When drops contact a surface under an acute angle the spatter takes an oblong pear-shaped form or a flask-shaped form, the pointed ends correspond to the direction of movement of the splashes, and the wider points correspond to the place of initial contact with the collecting surface. When a drop contacts a horizontal surface, the traces of spatter have a spherical or slightly oval form with even or scalloped edges.

Under the action of centrifugal force, a spatter, which is created when blood is flung from a blood-bearing object in motion onto a surface, will cast more spatter in the form of parallel stripes of blood that look like the teeth of a comb (traces of centrifugal displacement).

The description of a spatter must contain the shapes and sizes, the general area of distribution with the indication of vertical (from the floor surface) and horizontal (from the wall) distances, the direction of the acute-angled end or serrated edge. It is very important to indicate the nature of the splash grouping, the general form of the grouping, the distance between spatters, the amount of spatter in different sections of the grouping.

The value of a blood spatter for the investigative practice:

- allow to make conclusions about the height of source of bleeding, the nature of the injured vessel, injured body part, the interposition of the victim and the attacker, the source of bleeding in relation to the barrier, the angle of fall, the position of the person and the weapon.

Continuous surface or discontinuous deposition of blood on different objects is often called a swipe pattern. The surface structure of such a pattern points to the place of impact of two objects but does not give any hints on their interaction dynamics.

A blood smear is the deposition of blood that is created by disconnected actions as a result of dynamic (peripheral) contact of blood-bearing body parts or objects with a recipient surface. Smears can often be caused by the movement of a bloody body or object across a surface, their wiping or their dragging. Due to such movements the shapes of the smears are usually indefinite, the sizes are different, the edges and ends have indistinct boundaries.

It is necessary to note at which end and edge the blood buildup is thicker, because the thickness of the blood buildup gradually decreases in the direction of travel.

The value of blood smears for the investigative practice:

- allow to make conclusions about the actions of the victim and the attacker and about the distinctive features of the object that created the smears.

Prints are determined as the transfer of the print from a bloodstained object or body on a surface, which is created when a bloody object contacts with a recipient surface and the object is removed without any further movement. Such traces can more or less give an idea on the external structure of the object which left the blood print. The most common prints found at the scene of crime are fingerprints, handprints, footprints.

The value of prints in the investigative practice:

- allow to identify the object, the person, who left the print, contributes to their tracing. Allow to make conclusions about the position and pose of the person, his/her actions.

Smear-prints are called traces created by the combination of static and dynamic contact of the bloodstained body or object with a surface. Such traces are produced when there is a substantial amount of blood on an object. Such traces appear when the weapon is wiped. The part of the trace, where the object contacted with a surface, has rather distinct ends and edges and hints at the shape of the object (weapon). Contrary, the part of the trace, which was in dynamic contact with the object, has smudged edges; it reminds a smear.

During the examination and description, it is necessary to note the configuration and size of the smear-prints, the distinctiveness of the edges, the distance between distinct and smudged edges, the expressiveness of one end and the smudginess of the other end, the presence or absence of a papillary picture.

The value of smear-prints in the investigative practice:

- partially show the configuration and sizes of the part of weapon that has been wiped;
- confirm the fact of active actions of the assaulter and the victim;
- sometimes allow to identify the weapon by the shape and size of the trace.

The detection of traces that look like blood

Provided that blood traces were preserved and weren't destroyed, it is possible to detect them in the process of visual examination with a magnifying glass.

Fresh blood traces are bright red, in a month the traces become reddish brown, in 6 months — brown-grey. Blood traces that are subject to decomposition have a greenish color.

On metallic objects the blood traces can have the shade of ferric oxide.

In order to detect blood stains on dark-colored objects, on textile materials of black, dark red and brown colors, it is necessary to conduct the examination under the conditions of good lighting.

When blood traces are found in hard-to-reach places (floor cracks, space under the parquet, dents and damages on vehicles, seams and pleats in clothing) or have been washed out, it is necessary to use UV rays during the examination. Blood stains are not fluorescent and look like dark "velvet" stains against the fluorescent background of the surrounding surface. It is also reasonable to use luminol tests. Luminol is applied to the suspected areas of clothing. If any blood traces are present, the expert witnesses a blue glow and production of white foam in the areas of the traces.

The description of traces that look like blood

It is recommended to describe the trace evidence found at place of discovery according to the following plan:

- precise localization of the trace (name of the object, its part and surface, distance from landmark);
- name of trace (flow, droplet);
- shape of trace (circular, stellular);
- size of trace (the general sizes by two perpendicular lines, sizes of separate details, direction of longitudinal axis of the trace (vertical, horizontal, slantwise vertical, slantwise horizontal);
- colour of trace (red, brown, *etc*.);
- nature of the edges of trace (even, serrated, *etc*.);
- presence (absence) of blood crust on the surface of trace.

The term "*stain*" is used to identify traces, the mechanism of appearance of which is impossible to establish. It is rational to use this term in cases when evidence of biological origin is found on fur, hay, laced garments, on wet surfaces, after attempts of washing, when the

substance spread from its initial borders, in conditions of poor lighting and indistinctness of trace.

When describing stains at place of incident it is necessary to specify the location, colour, amount, interposition, shape, size, edges, the evenness of the layer, the intensity of the saturation.

Semen stains are detected in the process of visual inspection (or using a magnifying glass) of the body and clothing, of bed linen and other objects. It is possible to find semen stains with the aid of UV rays (they produce a blue glow); with the chemical reagent "Phosphotest" (the indicative layer which is saturated with this reagent, is moistened and then pressed to the edge of the researchable object; purple coloration in 20–30 seconds of time confirms the positive result).

Semen stains have an irregular shape with curving outlines on absorbent surfaces; the density of semen stains is similar to that of starch. On dark fabrics semen stains have a whitish color, on light fabrics — grey with yellow or brown shades. On non-absorbent surfaces the semen stains look like depositions of white-grey color, sometimes with a yellowish shade.

Hair is usually detected in the process of visual inspection or with the aid of a magnifying glass.

If necessary, by order of the investigator the forensic medical expert can take hair samples of the corpse's head or other body parts in the place of discovery. The expert can also take hair samples during the examination of suspects and victims.

The collection of evidence of biological origin at the place of discovery:

- If possible, the whole carrier-object with suspicious traces should be sent to laboratory examination. It is necessary to pack such objects in a way to eliminate the chance of alteration or loss of trace.
- If the carrier-objects have large format, it is necessary to collect the part of the object with the traces (cut out, saw out), as well as areas without traces.
- If the objects are large and valuable, it is necessary to take swipes and swabs (similar swipes and swabs are taken from surfaces free of traces).
- Blood traces on a plastered wall are collected by the sawing out or chipping off the plaster. The plaster chip has to include the areas with traces, as well as unstained areas (for control). If it is impossible to cut out a piece of the plaster, it is necessary to take a swipe of the trace and of unstained areas of the plaster.

- If traces (for example, blood) are found in any liquid, it is necessary to dip a clean piece of gauze bandage into the liquid, and then take it out and dry.
- Traces found in the soil are to be collected with the soil itself, preferably the whole depth of saturation (the collected soil is spread in a thin layer, dried and packed in paper bags, that are then sent in the laboratory; bags with soil for control is prepared in the same way).
- Blood traces found on the snow, as well as fluid blood, semen, urine, are gathered with clean pieces of gauze bandage folded in several layers (gauze tampon), which is then dried. After the gauze bandage has been dried it is packed and sent to laboratory examination. It is obligatory to enclose a reference sample of the gauze tampon (if the trace was taken together with snow, the reference sample of the gauze tampon has to be saturated with clean snow and then dried). The recommended size of the gauze bandage is no more than 2 × 2 cm.
- Liquid from a pool is seized into a clean serum vial no more than 10 ml of volume. If this is impossible to conduct, the pool is pat dry with pieces of gauze bandage (4 × 4 cm); the reference sample of gauze bandage is sized 10 × 10 cm.
- Hair (or other similar objects) is seized with the aid of forceps with a rubber tip into separate paper bags.

Evidence of biological origin is packaged in order to be sent to the crime laboratory. The evidence is handled in a way that prevents any loss, substitution or changes in the evidence (for example, contamination) between the time the evidence is removed from the crime scene and the time it is received by the crime laboratory. It is prohibited to pack evidence of biological origin in plastic bags! Dry blood traces are closed by clean pieces of paper or material that is sewed on or tied to an object. It is forbidden to outline the blood traces with pencils, paints, ink, chalk, because such exposure of chemicals can possibly cause changes in the research object. It is necessary to keep physical evidence with blood traces in a dark dry place. Objects that supposedly carry evidence of biological origin are separately packaged in paper envelopes or boxes. Each paper bag must contain the following information: name of object, who it belongs to, place and time of collection, investigator's signature and date.

Documentation of Examination Results

In accordance with the Criminal Procedure Code of the Russian Federation the results of the examination of the crime scene and the corpse at the place of discovery, as well as the time of the start and end of the examination, are supposed to be recorded in a protocol that is written by the investigator (Articles 166, 180 of the Criminal Procedure Code).

The findings of the external examination of the corpse at place of discovery or crime scene have to be presented in the protocol, written in an official manner, described in the order that the examination was conducted. The description of any object or corpse from the crime scene must be clear and detailed, so that any person reading the report could immediately imagine the scenery of the event.

The doctor involved in the examination of the corpse in the place of discovery (crime scene) as a specialist has the right to make remarks and complementary statements, which are to be recorded in the protocol.

The protocol of examination of the corpse in the place of discovery (crime scene) is prepared in two copies (typed or handwritten). All participants of the examination of the corpse in the place of discovery (crime scene) review the protocol and then sign it.

The investigator makes a plan of the place of discovery (crime scene): a picture with legends keys in an orthographic projection that is conducted on a scale or generally. The plan of the place of discovery of a corpse (crime scene) is an illustrative supplement to the protocol of examination. The photographic coverage conducted at the place of discovery of the corpse (crime scene) serves the same purpose.

When an autopsy is necessary, the investigator issues an order for commissioning of expert studies, in other cases the investigator issues a certification for medicolegal analysis of a corpse.

One copy of the protocol of examination and the order for commissioning of expert studies or medicolegal analysis of the corpse together with the corpse itself are directed to the mortuary, in which the autopsy (analysis) will be conducted.

Main Issues Resolved by the Medicolegal Assessment of the Corpse

In accordance with Article 58 of the Criminal Procedure Code of the Russian Federation, a specialist is involved in the external examination of the corpse in the place of discovery (crime scene) in order to render assistance in asking questions that are supposed to be solved during the performance of the medicolegal analysis.

It is compulsory to answer the following questions in the process of the medicolegal analysis of the corpse:

- What is the cause of death?
- What is the time of death?
- What kind of injuries does the corpse have?
- Did the deceased drink alcohol short before the death?

If any injuries are found in the process of the external examination, the forensic medical expert may be asked additional questions. A detailed list of questions can be found in the corresponding chapters of these guidelines.

Depending on the circumstances of the crime, the forensic medical expert may be asked additional questions that are important in this case. The main requirement to the questions is that they should not be beyond the scope of specific knowledge of the forensic medical expert (competence level).

Questions for Self-Control

1. What do the terms "crime scene" and "place of discovery of the corpse" mean?
2. Who is competent for the organization and conduction of the examination of a corpse in the place of discovery (crime scene)?
3. Who can be attracted to participate in the examination of a corpse in the place of discovery (crime scene)?
4. What are the duties of the forensic medical expert or the doctor, involved in the examination as a specialist in the examination of a corpse in the place of discovery (crime scene)?
5. In accordance with what signs is death pronounced?
6. What is the order of the examination of a corpse in the place of discovery?
7. What information about the corpse is supposed to be recorded in the protocol of examination?
8. To what questions can a doctor-specialist give an assumptive answer based on the initial external examination of a corpse in the place of discovery (crime scene)?
9. What criteria are used to establish the time of death?
10. What is the medicolegal meaning of the early postmortem changes and supravital reactions?
11. What questions should the Order for commissioning expert studies contain in all cases?
12. What questions is it reasonable to ask an expert, if injuries on the corpse are found?
13. Based on which signs do the experts establish whether the initial position and pose of the corpse has been changed?
14. What traces (of biological origin) can be found at the crime scene?
15. What are the requirements for the collection of evidence of biological origin at place of their discovery in order to send them to the subsequent medicolegal analysis?

Test for the Control of Initial Knowledge

Instructions for questions 1–15:
*choose **one** the most suitable answer*

1. The rules of criminal procedure established in the Criminal Procedure Code are compulsory for:
   a) the court
   b) prosecutor's offices
   c) preliminary investigation bodies
   d) inquiry bodies
   e) all of the above

2. The thorax cavity is limited from the back by the following:
   a) *scapula* (shoulder blade)
   b) *latissmus dorsi* (broadest muscle of back)
   c) spine and internal intercostal muscles
   d) diaphragm
   e) internal intercostal muscles

3. At what minimal body temperature is resuscitation possible?
   a) 21°C
   b) 23°C
   c) 24°C
   d) 25°C
   e) 27°C

4. The aims of the Criminal Procedure Code are:
   a) the protection of the constitutional system of the Russian Federation from criminal infringement
   b) peacekeeping and securitization, as well as prevention of crimes
   c) the protection of peoples' rights and freedoms, protection of property, public order and public safety
   d) the protection of public order and public safety
   e) all of the above

5. Reversible cessation of cardiac function, breathing and the disappearance of all vital signs of the organism is called:
   a) biological death

b) clinical death
c) coma
d) sopor
e) agony

6. The rules of criminal procedure on the territory of the Russian Federation are established by the Criminal Procedure Code, which in its turn is based on:
   a) the Criminal Code
   b) the Penal Code
   c) the Constitution of the Russian Federation
   d) the Civil Procedure Code
   e) the Civil Code

7. The thorax cavity is limited from the bottom by the following:
   a) transverse muscle of the thorax
   b) diaphragm
   c) subcostal muscles
   d) abdominal rectus muscle
   e) internal intercostal muscles

8. Irreversible damage of tissue happens at a body temperature of:
   a) 37°C
   b) 39°C
   c) 41°C
   d) 43°C
   e) 52°C

9. The condition which is accompanied by weakening or absence of excitation response, reflex decrement, respiratory malfunction, decreased pulse is called:
   a) biological death
   b) clinical death
   c) coma
   d) sopor
   e) agony

10. Irreversible termination of physiological process in cells and tissues is called:
    a) biological death
    b) clinical death
    c) coma
    d) sopor
    e) agony

11. Necrosis of tissue, which is in contact with the environment, is called:
    a) myocardial infarction
    b) sequester
    c) gangrene
    d) maceration
    e) atrophy

12. The thorax cavity is limited on the top by the following:
    a) ribs
    b) collar bone (*clavicula*)
    c) thorax
    d) upper thoracic aperture
    e) subclavicular muscles

13. The following body temperature indicates hypothermia:
    a) 36°C
    b) 35°C
    c) 34°C
    d) 33°C
    e) 32°C

14. Myocardial infarction is necrosis:
    a) vascular
    b) toxic
    c) traumatic
    d) allergic
    e) hemorrhagic

15. Gangrene can develop in:
    a) brain
    b) spleen

c) small intestine
d) liver
e) kidneys

Instructions to questions 16–36:
*there can be **one** or **several** answers for each question*
or incomplete statement

Choose:

Answer	Statement
a	If 1, 2, 3 are correct
b	If 1 and 3 are correct
c	If 2 and 4 are correct
d	If 4 is correct
e	If all are correct

16. The following refers to cortical bones:
    1) elbow bone (*ulna*)
    2) upper arm bone (*humerus*)
    3) spoke bone (*radius*)
    4) capitate bone (*os capitatum*)

17. The axial skeleton does not include:
    1) bones of upper limb
    2) thoracic bones
    3) bones of lower limb
    4) cranial bones

18. In the course of interaction of actin with myosin the following occurs:
    1) release of the mediator in the neuro-muscular synapse
    2) inactivation of the mediator in the neuro-muscular synapse
    3) muscle relaxation
    4) muscle contraction

19. The following refers to uniaxial joints:
    1) radioulnar proximal joint
    2) elbow joint

3) radioulnar distal joint
4) atlanto-occipital joint

20. Blood-streaked stool (haematochezia) points to the bleeding in:
    1) stomach
    2) middle intestine
    3) duodenum
    4) rectum

21. The cause of pneumothorax is the damage of:
    1) lungs
    2) bronchi
    3) chest wall
    4) esophagus

22. The following refers to biaxial joints:
    1) ginglymoid joint
    2) simple joint
    3) compound joint
    4) condyloid joint

23. Melanorrhea (*melaena*) points to the bleeding in:
    1) stomach
    2) middle intestine
    3) duodenum
    4) rectum

24. Vomit with the color of coffee grounds points to the bleeding in:
    1) empty intestine
    2) twisted intestine (*volvulus*)
    3) segmented intestine
    4) stomach

25. The increase in calcium concentration in the sarcoplasm of the skeletal muscle during contraction is connected with:
    1) entrance of calcium into the cell membrane
    2) detachment of calcium from carrier protein
    3) intake of calcium from T-tubules
    4) exit of calcium from sarcoplasmic reticulum

26. One of the possible signs of death is the absence of response to:
    1) sound stimulus
    2) noxious stimulus
    3) thermal stimulus
    4) mechanical stimulus

27. The following refers to appendicular skeleton:
    1) cranial bones
    2) bones of upper limbs
    3) thoracic bones
    4) bones of lower limbs

28. The following refers to polyaxial joints:
    1) intervertebral joint
    2) radiocarpal joint
    3) pelvis joint
    4) metacarpophalangeal joints II–V

29. Which of the following is not considered a possible sign of death?
    1) rigidity of the body
    2) absence of breathing and heart beating
    3) skin paleness
    4) alteration of the pupil form to slit-like (Beloglazov sign)

30. The following refers to flat bones:
    1) bones of calvaria
    2) pelvic bones
    3) shoulder blade (*scapula*)
    4) ribs

31. The following refers to axial skeleton:
    1) cranial bones
    2) vertebral spine bones
    3) thoracic bones
    4) bones of lower limbs

32. Contraction of fibers of the skeletal muscle is caused by:
    1) communication of T-tubules' membrane with mediator
    2) communication of T-tubules' membrane with calcium

3) postsynaptic potential spreading on T-tubules' membrane
4) action potential spreading on T-tubules' membrane

33. The disruption of which organ is least probable in closed injuries of the stomach?
1) liver
2) spleen
3) kidneys
4) stomach

34. The following does not refer to tubular bones:
1) elbow bone (*ulna*)
2) upper arm bone (*humerus*)
3) spoke bone (*radius*)
4) capitate bone

35. The source of bleeding in the thorax injuries can be:
1) aorta
2) intercostal vessels
3) internal thoracic artery
4) lung vessels

36. The definite signs of death include:
1) lividity
2) mummification
3) autolysis
4) rigidity

Instructions to questions 37–42:
the question consists of two statements, linked with conjunction ***"because"****.*
First one has to decide whether each statement is true, then, if so, decide, whether causal relationship between them is true

Choose:

Answer	Statement 1	Statement 2	Relationship
a	True	True	True
b	True	True	False

Answer	Statement 1	Statement 2	Relationship
c	True	False	False
d	False	True	False
e	False	False	False

37. The position and pose of the body at the time of death can usually be inferred by the localization of postmortem lividity, **because** after death the blood moves to the lower parts of the body under pull of gravity.
38. Signs of mummification do not give an idea of time of death, **because** mummification depends on the distinctive features of the organism.
39. The decrease in body temperature lower than 23°C (measured per rectum) is a definite sign of death, **because** in all cases the rectal temperature of the body decreases after death.
40. It is possible to change the pupil shape into an oval only in a corpse, **because** the alteration of pupil shape under pressure is a definite sign of death.
41. The autolysis of certain glands is a natural process after death, **because** physiological processes in the glands stop immediately after death.
42. In some cases, the duration of the pre-agony state can be a couple of hours, **because** in some cases the duration of pre-agony state is prolonged by compensatory mechanisms.

Instructions to questions 43–72:
there are numbered items in the left column and in the right one — marked with Latin letter items. Match each numbered item to one or more corresponding items marked with a letter. Each item marked with a letter can be used once, several times or not at all in the course of the assignment

43	*Cerebellum*	a. *diencephalon*
44	*Corpus callosum*	b. *telencephalon*
45	*Hypothalamus*	c. *metencephalon*
46	*Fornix*	

47	Diacele	a. *diencephalon*
48	*Thalamus*	b. *telencephalon*
49	*Cerebral cortex*	c. *metencephalon*
50	*Corpus pineale*	
51	Pons	
52	Lateral ventricle	

53	Stomach	a. celiac artery
54	Sigmoid colon	b. superior mesenteric artery
55	Liver	c. inferior mesenteric artery
56	*Caecum*	
57	Vertex of rectum	
58	Twisted intestine (*volvulus*)	
59	Left side of transverse colon	
60	*Pancreas*	
61	Spleen	
62	Empty intestine	

63	Aortic valve	a. right *atrium*
64	*Foramen venae cavae*	b. right *ventricle*
65	Atrioventicular bicuspid valve	c. left *atrium*
66	Atrioventicular tricuspid valve	d. left *ventricle* (aortic)
67	Aortic *ostium*	
68	*Foramen superior venae cavae*	
69	Pulmonary valve	
70	Mitral valve	
71	Opening of pulmonary trunk	
72	Openings of pulmonary veins	

Test for Control of Acquired Knowledge

Instructions for questions 1–5:
*choose **one** the most suitable answer*

1. Who cannot be attracted to the examination of a corpse at the place of discovery as a specialist?
   a) surgeon
   b) general practitioner
   c) obstetrician-gynecologist
   d) pediatrician
   e) pharmacist

2. The examination of the place of incident is organized and conducted by:
   a) investigator
   b) doctor
   c) forensic medical expert
   d) crime scene technician
   e) canine handler

3. Postmortem lividity in the hypostasis stage can be observed if the death happened:
   a) 2–3 hours ago
   b) 4–12 hours ago
   c) 13–24 hours ago
   d) 25–36 hours ago
   e) more than 36 hours ago

4. Postmortem lividity in the stasis stage can be observed if the death happened:
   a) 2–3 hours ago
   b) 4–12 hours ago
   c) 13–24 hours ago
   d) 25–36 hours ago
   e) more than 36 hours ago

5. Blood traces in the form of drops are created as a result of:
   a) arterial bleeding

b) ballistic wound
c) movement of a bloody object across a surface
d) contact of a wet bloody surface with another surface
e) fall on a horizontal surface

Instructions to questions 6–24:
for each question or incomplete statement there can be
one *or* ***several*** *true answers*

Choose:

Answer	Statement
a	If 1, 2, 3 are correct
b	If 1 and 3 are correct
c	If 2 and 4 are correct
d	If 4 is correct
e	If all are correct

6. The forensic medical expert (or another doctor) conducts the examination at the crime scene (the place of discovery of a corpse):
   1) based on the directions of the investigator
   2) based on the directions of the district police officer
   3) based on the court ruling
   4) upon one's own initiative

7. Participating in the examination of a corpse at the crime scene, the forensic medical expert (or another doctor) is supposed to:
   1) make sure of the death of the victim
   2) send the trace evidence to laboratory analysis
   3) establish the existence of injuries on the body of the victim
   4) draw up a protocol of examination

8. Participating in the examination of the corpse at the crime scene, the forensic medical expert (or another doctor) is obliged to:
   1) record the position of the corpse
   2) make certain of absence of vital signs of the victim
   3) record postmortem changes
   4) establish the cause of death

9. For the approximate assessment of the time of death at the crime scene the experts use:
    1) rectal temperature
    2) stage of lividity
    3) intensity of rigidity
    4) response of cross-striated muscles to mechanical stimulus

10. During the examination of the corpse at the place of discovery the forensic medical expert (or another doctor) has the right to:
    1) conduct intubation of wound canal
    2) take smears from female genital organs
    3) dissect the edges of skin wounds in order to send them to crime laboratory
    4) conduct examination with UV rays

11. In the process of examination of a corpse in the place of discovery the forensic medical expert (or another doctor) has to note:
    1) size and shape
    2) direction of travel of blood
    3) state of ends and edges
    4) depth of the wound canal

12. In order to identify blood stains, it is necessary to conduct:
    1) visual examination (with the naked eye) in ordinary lighting
    2) examination with UV rays
    3) examination with a magnifying glass
    4) tests with hydrogen peroxide

13. The exhumation of a corpse shall be conducted in the presence of:
    1) forensic medical expert (or another doctor)
    2) investigator
    3) attesting witnesses
    4) official representative of the cemetery administration

14. The protocol of examination of the crime scene consists of:
    1) introductory part with conditions of examination
    2) descriptive part
    3) statements and comments
    4) assessment of examination results

15. The following people can participate in the examination of the crime scene:
    1) forensic medical expert
    2) investigator
    3) crime scene technician
    4) canine handler

16. The objectives of the forensic medical expert (or another doctor) in the process of examination of a corpse at the place of discovery are:
    1) rendering assistance to the investigator in the search, detection, description of evidence of biological origin
    2) assuring correct recording of the results in the protocol of examination
    3) determination of approximate time of death
    4) drawing up the protocol of examination

17. The objectives of the forensic medical expert (or another doctor) in the process of examination of a corpse at the place of discovery are:
    1) final determination of the cause of death
    2) approximate determination of the cause of death
    3) drawing up the protocol of examination
    4) determination of approximate time of death

18. The protocol of examination of the crime scene (corpse) must include:
    1) rectal temperature of the corpse
    2) state of lividity
    3) state of rigidity
    4) time of death

19. The rate of development of rigidity depends on:
    1) cause of death
    2) pose of a person at the moment of death
    3) degree of muscle development
    4) gender of the deceased

20. The color of lividity can depend on:
    1) degree of blood loss
    2) temperature and humidity of the environment
    3) cause of death
    4) nature of corpse's entomofauna

21. The temperature of a corpse depends on:
    1) temperature of the environment
    2) force and velocity of wind
    3) time of death
    4) presence of clothing on a corpse

22. The cadaveric fauna includes:
    1) reptiles
    2) fish
    3) rodents
    4) insects

23. Based on the level of rigidity it is possible to assume:
    1) approximate time of death
    2) cause of death
    3) the fact of alteration of the corpse's position
    4) conditions of the corpse's lodgment

24. Depending on the degree of mummification it is possible to establish:
    1) prescription of death coming
    2) cause of death
    3) conditions of the corpse's lodgment
    4) the fact of alteration of the corpse's position

Instructions to questions 25–30:
the question consists of two statements, linked with conjunction ***"because"****.*
First one has to decide, whether each statement is true, then, if so,
decide,whether causal relationship between them is true

Choose:

Answer	Statement 1	Statement 2	Relationship
a	True	True	True
b	True	True	False
c	True	False	False
d	False	True	False
e	False	False	False

25. In the case of a total destruction of the head as a result of mechanical injury it is unreasonable to conduct the examination of a corpse in the place of discovery, **because** in the case of a total destruction of the head the cause of death is established by external examination.
26. Based on the state of the adipocere it is possible to establish the season when the death happened, **because** adipocere is formed depending on the environmental conditions.
27. The determination of death time by the degree of putrefactive changes of a corpse has a fairly relative value, **because** the intensity of decomposition of tissue depends on environmental conditions.
28. Blood collected at the crime scene and a sample of the carrier-object must be sent to the crime laboratory, **because** in some cases the carrier-object can have an influence on the result of the analysis.
29. On the grounds of a written application from the relatives about the violent nature of death, the forensic medical expert must start the examination of a corpse immediately in the place of discovery, **because** a written application from the relatives about the violent nature of death is the cause for issuing an order on commissioning a forensic analysis.
30. It is unreasonable to conduct the examination of a corpse with signs of total decomposition, **because** in cases of total decomposition it is impossible to establish the cause of death.

Recommended Literature

1. *Forensic* medicine: students book. Buromsky I.V., ed. Moscow, 2020 [in Russian].
2. *Forensic* medicine. Pigolkin Y.I., ed. Moscow, 2012 [in Russian].
4. *Forensic* medicine. Kryukov V.N., ed.. Moscow, 2006 [in Russian].
5. *Federal* law "On state forensic expertise in Russian Federation" N 73-FZ dated May 31, 2001 [in Russian].
6. *Forensic* medicine and forensic expertise: national guideline. Pigolkin Y.I., ed. Moscow, 2014 [in Russian].
7. *Guidelines* for forensic medicine. Kryukov V.N., Buromsky I.V., eds. Moscow, 2017 [in Russian].
8. *Inspection* of the place of discovery and the corpse: handbook. Matyshev A.A., Molin Yu. A., eds. Saint Petersburg, 2011 [in Russian].
9. *Procedure* for organizing and conducting forensic medical examinations in state forensic institutions of the Russian Federation (approved by Order N 346n of the Ministry of Health and Social Development of Russia dated May 12, 2010). [in Russian].
10. *Romodanovsky P.O., Barinov E.K.* Forensic medicine in charts and pictures. Moscow, 2016 [in Russian].
11. *Viter V.I., Vavilov A.Yu., Babushkina K.A*. The working procedure of the doctor — a forensic medicine expert when examining a corpse at the place of its discovery: study guide Izhevsk, 2016 [in Russian].

Buromsky Ivan Vladimirovich
Ermakova Yulia Viktorovna
Kachina Natalia Nikolaevna
Kildyushov Evgeny Mikhailovich
Pinchuk Pavel Vasilievich
Sidorenko Elena Sergeevna
Sokolova Zoya Yurievna
Tumanov Eduard Viktorovich

GUIDELINES ON FORENSIC MEDICINE. PARTICIPATION OF A DOCTOR IN THE EXTERNAL EXAMINATION OF A CORPSE IN THE PLACE OF DISCOVERY (CRIME SCENE)

Study guide

Edited by I.V. Buromsky and E.M. Kildyushov

Translated from Russian by E.V. Egorova

Commissioning Editor I.E. Golovina
Editor D.A. Malysheva
Positioning G.V. Nesterova

Signed for printing 04.12.2020.
Format $60\times90^{1}/_{16}$. Volume 3 p. s. Edition 200 ex. Order N 45-20.

Printed by
Pirogov Russian National Research Medical University
Ostrovitianov str. 1, Moscow, 117997
www.rsmu.ru

ISBN 978-5-88458-510-2