

Introduction to Laboratory reports to the Practical Courses

Survey of topics

J00: Introduction, Regulations for the practical course of medical microbiology, First Aid
Topic J 01: Safety rules. Microscopic demonstration of microorganisms I
Topic J 02: Microscopic demonstration of microorganisms II
Topic J 03: Cultivation of bacteria
Topic J 04: Identification of bacteria according to biochemical activity
Topic J 05: Microbes and external influences, methods of decontamination
Topic J 06: Determining bacterial sensitivity to antimicrobial agents, proof of resistance factors
Topic J 07: Introduction to serology – agglutination and precipitation, dilution
Topic J 08: Complement-fixation test (CFT) and titre dynamics
Topic J 09: Neutralisation (ASO, HIT, VNT)
Topic J 10: Serological tests with marked components
Topic J 11: Molecular biology methods
Topic J 12: Clinical virology I
Topic J 13: Clinical virology II
Credit week – without protocol

Topic P 01: Diagnostics of staphylococci
Topic P 02: Diagnostics of streptococci and enterococci
Topic P 03: Diagnostics of other Gram-positive bacteria
Topic P 04: Diagnostics of enterobacteriae and bacterial agents of gastrointestinal infections
Topic P 05: Diagnostics of haemophili and pseudomonads
Topic P 06: Diagnostics of some other Gram-negative bacteria: neisseriae, branhamellae, bordetellae, legionellae, francisellae and brucellae
Topic P 07: Diagnostics of anaerobic bacteria
Topic P 08: Diagnostics of mycobacteria and nocardiae
Topic P 09: Diagnostics of spirochetal infections
Topic P 10: Clinical mycology
Topic P 11: Laboratory diagnostics of parasitic infections
Topic P 12: Bacterial biofilm
Topic P 13: Clinical microbiology I – sampling and transport of material, specimen preservation
Topic P 14: Clinical microbiology II – examination of common clinical specimens
(Theme might occur some changes)

Authors of topics:

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Introduction

Dear colleagues,

Practical courses represent a basic form of teaching medical microbiology at the Faculty of Medicine. Their contents reflect basic principles microbiological diagnostics. The spring term starts with methods of direct diagnostics of infectious agents – microscopy and cultivation, and a survey of identification of the cultivated bacteria. It continues with the topics concerning the effects of our antimicrobial activities and subsequent description of different serological procedures, the understanding of which is a common source of problems for students. The end of the term is dedicated to a survey of methods of molecular biology and virological methods. The autumn term covers the field of laboratory diagnostics of important bacterial species and also pathogenic fungi and parasites. Last topics are those of biofilm and clinical microbiology dealing with sampling, transport of material and examination of important clinical specimens.

The aim of the practical courses of microbiology is to provide an overview of the basic microbiological methods and ways of interpretation the results of the microbiological tests. Our intention is not the preparation of specialized microbiologists but of future general practitioners. Therefore, the text doesn't include detailed descriptions, the individual procedures are highly simplified and the emphasized part is not the realization itself but understanding the principles, reading the results and their recording and interpretation.

The purpose of the lab reports to practical courses is to save the time necessary to write down the tasks and enable students to record only the final results and their interpretation. The prerequisite of effective use, however, is the students' preparation for the course. Appropriately completed lab reports may then serve as an aid to refresh their memory before the examination, as the topics of the practical courses also constitute a part of the exam. Each topic also contains questions, the answers to which should be thought about in advance, since many of them are so-called "saving" questions.

The title Lab reports was chosen intentionally, to train you, future doctors, in making records. The lab reports must be legible, text in ink or ballpoint pen but not in pencil. Every page must contain date and information about the student at the bottom. It is important to remember that errors mustn't be erased, pasted over or blotted out; they must be crossed with a single line in order to remain legible. Schemes are to be drawn in pencil, colour differences in coloured pencil. At least red and blue one will be required. Don't underestimate the processing of the lab reports, as their presentation at the examination will influence the overall impression.

Appropriately completed lab reports will enable you to understand the basic principles of microbiological diagnostics, to find out what to expect from microbiological tests, and to learn the ways of interpreting the results correctly for the benefit of your future patients.

Miroslav Votava

Regulations for the Practical courses of microbiology

All the Department of Microbiology is a place of work with the risk of *professional infection*. In the rooms designed for the practical courses the risk is minimal; nevertheless, students are still obliged to behave according to the principles of health protection and safety rules. Further risk is represented by burning *burners*. Therefore, I have issued the following regulations which all the students and lecturers are obliged to comply with.

- Students may enter the Department using the H1 entrance to the waiting room; there they stay until the assistant comes.
- Students may put off their coats only in the wardrobe in the waiting room. The wardrobe will be locked at the beginning of the practical course and the key placed as specified.
- In case that a student has valuables or a large amount of money on him, the assistant must be informed and will see to their safekeeping.
- Students enter the course room using the entrance from the waiting room. They take with them only the lab reports, pens and pencils.
- In the practice room students will be lent protective coats. It is forbidden to write on coats or damage them in any other way, or to visit other departments wearing them. Private coats are not allowed.
- All materials and instruments may be used only for the purposes stated in the protocol or in the assistant's lecture. It is forbidden to carry anything out of the practice rooms, especially infectious material.
- Students are obliged to maintain the principles of personal hygiene carefully. They always disinfect and wash their hands after biological contamination and before leaving the practice room.
- When working it is necessary to avoid activities with potential risk of infection – rubbing eyes, picking nose, scratching head, biting nails, pens or pencils etc.
- Hands are disinfected using 0.5% Chloramine B or 0.2% Persteril for 2 minutes. Then they are washed using warm water and soap.
- Bringing food and drink in the practice room is strictly forbidden. Smoking is forbidden in all the hospital area. Disturbing behaviour or throwing away litter in front of the building or in the waiting room is also forbidden.
- The work of pregnant women and those up to 9 months after the childbirth in infectious areas is forbidden. Pregnant students are obliged to inform the Dean of the Faculty
- All waste and used material must be placed appropriately according to the assistant's instructions. Materials for repeated use are stored in their original place.
- After finishing work microscopes (if they have been used) must be cleaned, switched off and covered, all gas inlets and water taps must be closed and checked and working desks must be disinfected.
- Any injury, however small, must be reported to the assistant, as well as any accident involving contamination of persons or items with biological material.
- In the case of contamination of skin or penetration of infectious material into the organism, see the following table.
- Broken or spilt samples are disinfected with 5% Chloramine B or 1% Persteril for 2 hours, in case of blood or mycobacteria overnight.
- Burner may be in use only for the minimum time necessary. When using the burner students are required to work with high caution so as to avoid the risk of their hair or sleeve catching afire.

- Laboratory is no place for thoughtless behaviour, idle activities or mess. Working procedures must be performed precisely and assistants' instructions must be followed strictly.

FIRST AID – Regulations for laboratory accidents

- a) penetration of infectious material in the mouth**
don't swallow, immediately spit out in a disinfectant, wash out your mouth and gargle with 0.2% hydrochloric acid or Lugol's dilution, drink a glass of 0.2% hydrochloric acid and 20 minutes later take 4 pills of activated charcoal
- b) penetration of infectious material in the eye**
immediately wash out with a large amount of water, then with bacterial infections apply Ophthalmo-Septonex eye drops and Ophthalmo-Septonex eye ointment (affects also enveloped viruses) or Ophthalmo-Framykoin eye drops and ointment; with viral infections apply 20 times diluted solutions containing povidoniodid (Betadine, Braunol), then continue as with the procedure in case of penetration in mouth (from gargling on)
- c) penetration of infectious material in nose**
repeatedly blow your nose in a piece of cellulose – then with bacterial infections apply Ophthalmo-Septonex eye drops and Ophthalmo-Septonex eye ointment in the nose (affects also enveloped viruses) or Ophthalmo-Framykoin eye drops and ointment; with viral infections apply 20 times diluted solutions containing povidoniodid (Betadine, Braunol), then continue as with the procedure in case of penetration in mouth (from gargling on)
- d) minor clean injuries:**
disinfect with tincture of iodine or Iodisol, cover with plaster
- e) minor infected injuries**
let the wound bleed in 0.5% Chloramine B or 0.2% Persteril, then swab the surroundings with the tincture of iodine or Iodisol, in case of bacterial contamination powder with Framykoin and cover with bandage. Jabs must be sucked out with vacuum. With highly virulent infections (plague, ganders, rabies, syphilis, tetanus, encephalitis) the wound must be immediately excised at the surgery department.

In case of wounding or contaminating mucosa with material containing agents of serious infections (apart from the above mentioned also hepatitis HbsAg-positive and negative, AIDS, pyogenic infections, TBC, typhoid fever, dysentery), inform the staff of the infectious diseases department and consult the necessity of further actions (surgical treatment, application of normal or specific immunoglobulin, specific prophylaxis with antibiotics or chemotherapeutics etc.)

All injuries, even minor ones not requiring sick leave, must be reported and recorded in the minor injury record kept at the head of the Department's office.

The above mentioned drugs and material are kept in the freely accessible first-aid kit in the practice room. The assistant will report every use of drugs or material from the first aid kit to the laboratory worker responsible for completing the equipment of the kit.

Prof. MUDr. Miroslav Votava, CSc.

I confirm that I read the text above and I will follow these instructions.

_____. 2. 2009 _____ (signature)