2. LÉKAŘSKÁ FAKULTA
UNIVERZITA KARLOVA

Univerzita Karlova

FN MOTOL

Národní institut
virologie a bakteriologie

Sampling and types of material, transport to the laboratory

Jakub Hurych

Department of Medical Microbiology, 2nd Faculty of Medicine, Charles University and Motol University Hospital

Microbiology I.
Practical exercises

What is microbiology useful for?

- Knowledge about infectious agents, their diagnosis and treatment

- Your **first encounter** with clinical medicine – we will teach you to think like a doctor

- You need knowledge of microbiology **in all branches of medicine**
  - Pathology
  - Infectious medicine
  - Internal medicine, paediatrics, surgery, etc.

Learning objectives

Cílem je Vás připravit na pobyt ve světě skutečné medicíny

Mikrobiologie I a II - zkoušky

- **Praktická část** – LS 2.roč (na zápočet)
  - Popis nálezů (mikroskopie, kultivace, PCR, sérologie)
  - Znalost odběru materiálu v dané situaci
- **Teoretická část –** 3 otázky
  - **Obecná mikrobiologie**
  - **Speciální mikrobiologie** (viry, bakterie, houby, paraziti)
  - **Klinická mikrobiologie**

- **Microbiology II Examination**
  - During the winter semester examination period
  - You must take your first attempt during the winter examination period
  - Resit dates are announced in February and then during the summer examination period, with second resit dates also in September

Klinická mikrobiologie - zkouška ve 4. ročníku

- Diferenciální diagnostika nálezů, jejich interpretace a řešení
- Správná indikace ATB v jednotlivých klinických situacích

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Conditions for credit

- **Participation in practical exercises** (20% absence is permitted, i.e. two practical exercises per semester)
  - Practical exercises "Microscopy in bacteriology" in week 2 and "Bacterial cultivation and procedures leading to bacterial identification" in week 3 are **compulsory topics** covered by the Dean's Measure. 4/2022. If you are unable to attend with your circle, you will need to replace the exercise with another circle, or arrange another form of replacement with your circle assistant.

- Obtain a total of **14 out of 20 points from two credit tests** during the semester (they are written in weeks 6 and 14 at the beginning of the lecture, always 10 single-choice questions in 10 minutes; see Syllabus LS). In case of illness and inability to attend the test, contact your seminar assistant; it will be possible to replace the test with an oral examination. Exam test topics:
  - **Test I:** General microbiology, examination methods (within the scope of lecture topics and practical exercises – except mycology and parasitology), antimicrobial agents
  - **Test II:** Special bacteriology + examination methods in mycology and parasitology (except for topics covered in lectures in week 14)

- **Take a practical exam** in week 13 during practical exercises (see below). Practical exam
  In the summer semester, your knowledge will be tested on:
  - Be able to describe at least the basics of microscopic or culture findings (real or virtual) or describe and interpret the results of molecular or serological tests
  - Know the types and uses of basic sampling kits in microbiological diagnostics

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Absences and substitutions - other

- After consultation with the club assistant, you can substitute with another club.

Wk	Date	**Lecture** (Thu 11:40, Pelouch Hall)	**Presenting**	**Week's practicals** (gr.2 Mon 8:00, gr.1 Tue 8:00, gr.3 Wed 11:40, gr.4 Fri 8:00)
1	26.02.2026	**Introduction to Medical microbiology, basics of bacterial cell genetics**	Doc. MVDr. Oto Melter, Ph.D.	Preanalytical phase of microbiological diagnostics
2	05.03.2026	**Bacterial cell. Pathogenicity of bacteria.**	RNDr. Jan Tkadlec, Ph.D.	Microscopy in bacteriology
3	12.03.2026	**Introduction to antibiotics. Systematics of antimicrobials I** (execpt for betalactams).	doc. MVDr. Oto Melter, Ph.D.	Bacterial cultures and procedures leading to the identification of bacteria
4	19.03.2026	**Molecular microbiology**	Prof. MUDr. Pavel Dřevínek, Ph.D.	SEMINAR: BETALACTAM ABS.Antimicrobials susceptibility testing (AST)
5	26.03.2026	**Significant G+ cocci I** (staphylococci)	RNDr. Jan Tkadlec, Ph.D.	Serological methods
6	02.04.2026	**G+ cocci II** (streptococci and enterococci) **- CREDIT TEST I**	Mgr. Marcela Krůtová, Ph.D.	Diagnostics of G+ cocci I (staphylococci)
7	09.04.2026	**G+ rods** (corynebacteria, listeria, clostridia)	Doc. MVDr. Oto Melter, Ph.D.	Diagnostics of G+ cocci II (streptococci and enterococci)
8	16.04.2026	**G- bacteria I** (enterobacteria) **w/ G+ and G- anaerobes**	MUDr. Anežka Gryndlerová	Diagnostics of important G+ rods (corynebacteria, listeria, clostridia and bacilli)
9	23.04.2026	**G-bacteria II** (non-fermenters, Campylobacter, Helicobacter)	doc. MVDr. Oto Melter, Ph.D.	Diagnostics of G-bacteria I. (enterobacteria) and anaerobes
10	30.04.2026	**G- bacteria III** (fastidious: Bordetella, Legionella, Haemophilus, Meningcoccus)	MUDr. Daniela Lžičařová	Diagnostics of G-bacteria II - nonfermenters, Campylobacter, Helicobacter
11	07.05.2026	**Mycology I:** general principles, antifungal agents, dermatophytes	MUDr. Daniela Lžičařová	Seminar: Brucella, Francisella. Diagnostics of G-bacteria III - fastidious bacteria (bordetella, Legionella, haemophilus, meningococcus) **Wednesday:** Rector's sport day
12	14.05.2026	**Mycology II:** Candidiasis, cryptococcosis, aspergillosis, mucormycosis, *Pneumocystis jirovecii* pneumonia.	MUDr. Daniela Lžičařová	Diagnostic methods in mycology // SEMINAR: General parasitology. Basics of malaria and intestinal paraitics diseases. Diagnostic methods in parasitology
13	21.05.2026	**General virology. CREDIT TEST 2.**	MUDr. Petr Hubáček, Ph.D.	Diagnostic methods in mycology // SEMINAR: General parasitology. Basics of malaria and intestinal paraitics diseases. Diagnostic methods in parasitology
14	28.05.2026	**Consulations.**	NA	**PRACTICAL EXAM**

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Where can you find us?

- At the institute
- On the web
- On SIS
- By email
  - jakub.hurych@lfmotol.cuni.cz
- By telephone
  - 22443 5390 – Faculty Secretary Ms Laušerová

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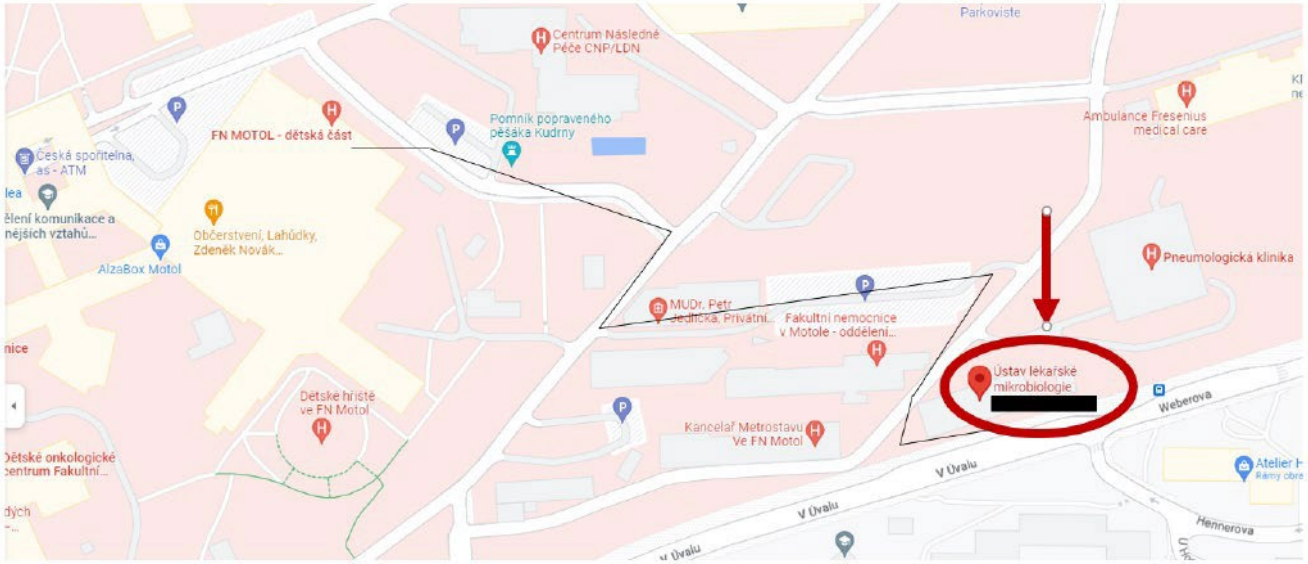
Where to go for practical training?

- Please come in all at once.
- Through the main entrance from the road – ring the bell
- In exceptional cases, no one may answer the door.
  - Do not run away, as you will miss the lesson.
  - You can go around the institute and ring the bell at reception, where there is always someone on duty
  - You can call 22443 5390 (secretariat)



Before entering the "infectious environment"

- Put your belongings in the lockers + lock them
- Put on OUR gowns; you will not be taking them off
- No food or drink allowed!
- Leave everything downstairs; if you take anything upstairs, it will be disinfected
- After finishing your practical work, return the coats to the individual lockers.
  - All coats in one locker – a disaster
  - One tyre in all lockers – big trouble
  - **Leave the key here, please!**

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Practical training room = laboratory

- Follow safety rules
  - Sharp objects
  - Chemicals
  - Fire
  - Electricity
- Turn off microscopes
- Report broken glass before you cut yourself
- The toilet is across the hall, ladies BE CAREFUL OF YOUR HEADS
  - Sometimes a draught opens the window and you could hit your head

Sign the safety acknowledgement

Questions?

Ask away.

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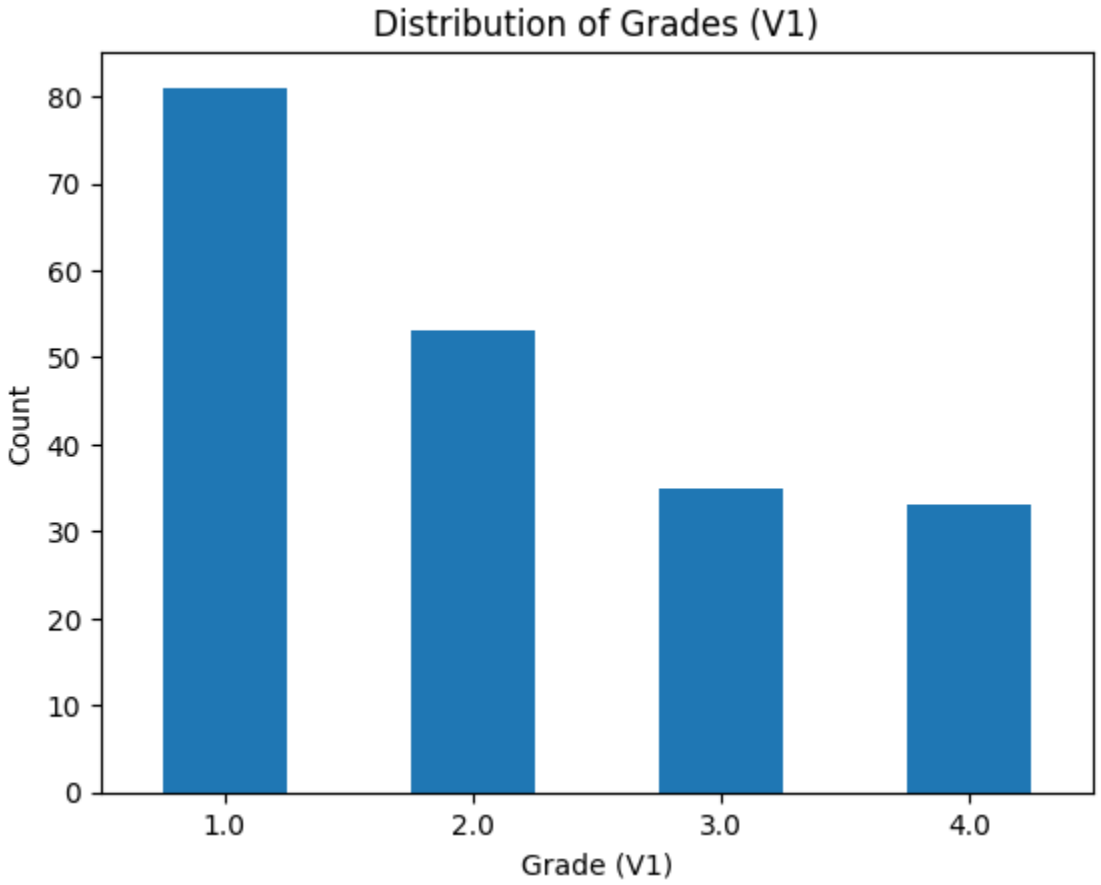
How did your colleagues fare in winter:



- As of 23 February 2026, 202/205 tested

Percentage representation of marks

- **1:** 81 (40.1%)
- **2:** 53 (26.2%)
- **3:** 35 (17.3%)
- **4:** 16 (16.3%)

Average mark

2.10

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How did your colleagues do?

Examiner	1	2	3	4	sum
Pavel Dřevínek, Professor, Doctor of Medicine, Ph.D.	15	14	12	15	56
Hubáček Petr, MD, PhD	9	3	1	4	17
Melter Oto, Docent, Doctor of Veterinary Medicine, Ph.D.	48	30	21	13	**112**
Nyč Otakar, MD, PhD	9	6	1	1	17

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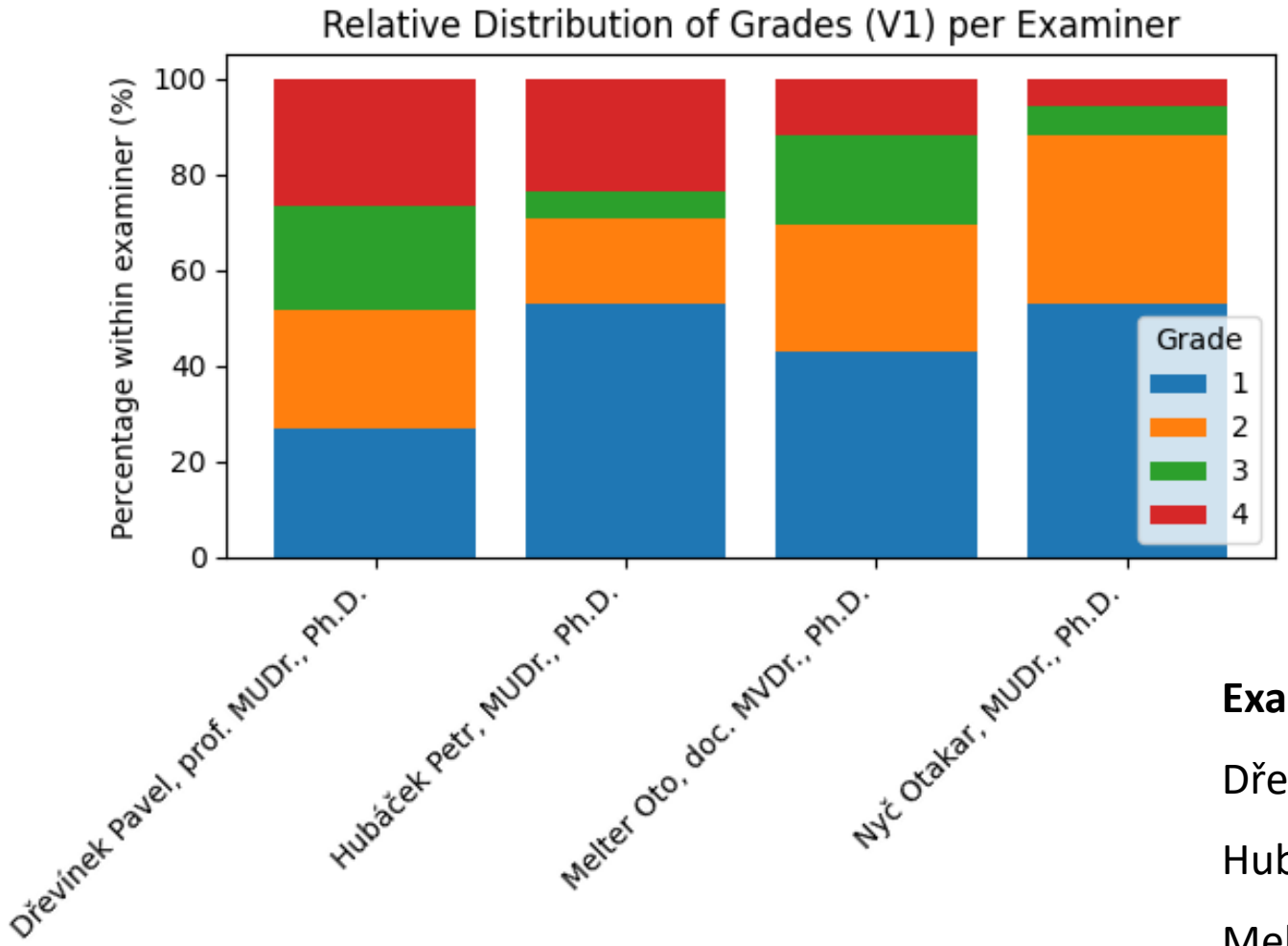
How did your colleagues do?



Examiner	1	2	3	4
Dřevínek	26.79	25.00	21.43	26.79
Hubáček	52.94	17.65	5.88	23.53
Melter	42.86	26.79	18.75	11.61
Nyč	52.94	35.29	5.88	5.88

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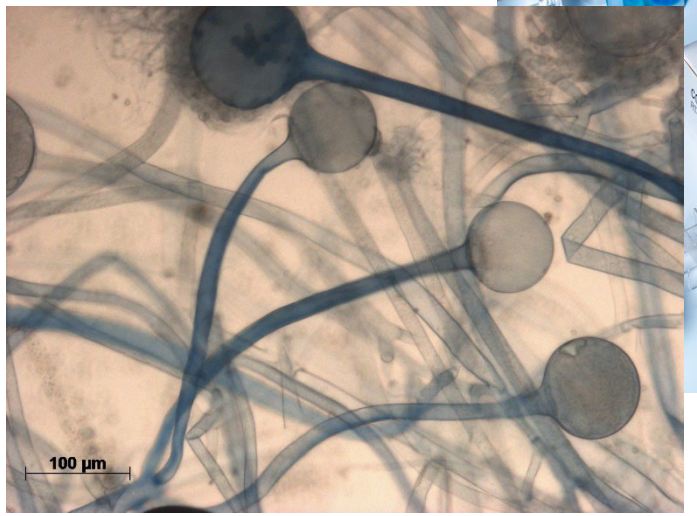
General principles of microbiological diagnostics

General principles of microbiology

- Microbiology is a diagnostic and consultative field
  - Subfields: bacteriology, mycology, virology, parasitology

- The aim of diagnostics:
  - To provide diagnostic, therapeutic and epidemiological data

- The aim of consultation:
  - To interpret findings in the context of the clinical situation,
  - to administer appropriate antibiotic treatment and maintain a rational antibiotic policy



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Specifics of microbiology

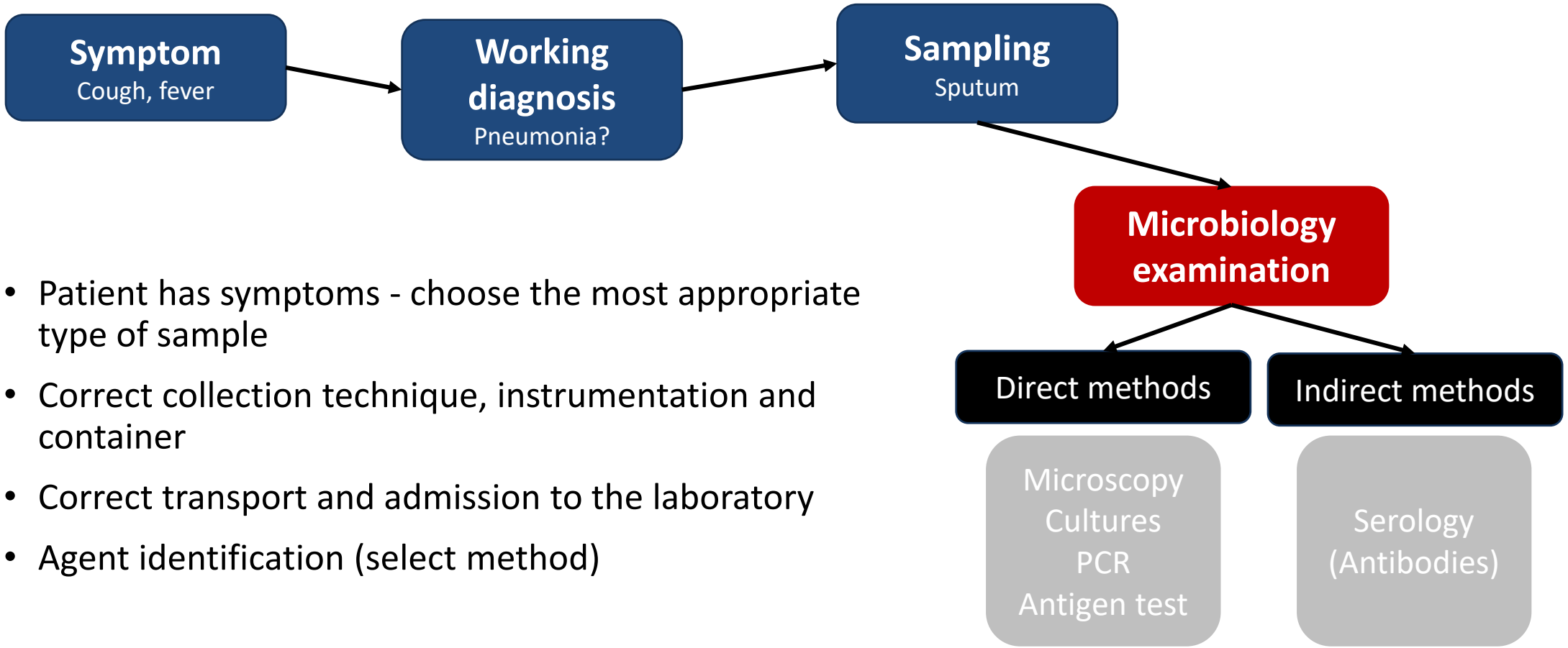
- It depends on the type and location of the material
- A large proportion of manual work

- Longer time to results (depending on the method)
  - Depends on the generation time of bacteria (**cultivation**)
  - Negative results may be obtained earlier than positive ones

- Need to evaluate partial results
- Clinical question:
  - Biochemistry: 1:1
  - Microbiology: 1:N

- **The result must be interpreted in a clinical context**

General principles



- Patient has symptoms - choose the most appropriate type of sample
- Correct collection technique, instrumentation and container
- Correct transport and admission to the laboratory
- Agent identification (select method)

General procedure for microbiological examination (1-2)

CLINICAL PHASE

1. Indication phase

- The patient has symptoms
- Establishing a working diagnosis

2. Sample selection

- Swabs (mucous membranes, wounds)
- Sputum, tracheal aspirate, BAL
- Pus, exudate (fluid material)
- Stool, rectal swab
- Tissues
- Urine
- Foreign materials (catheters, implants)
- Blood for haemoculture

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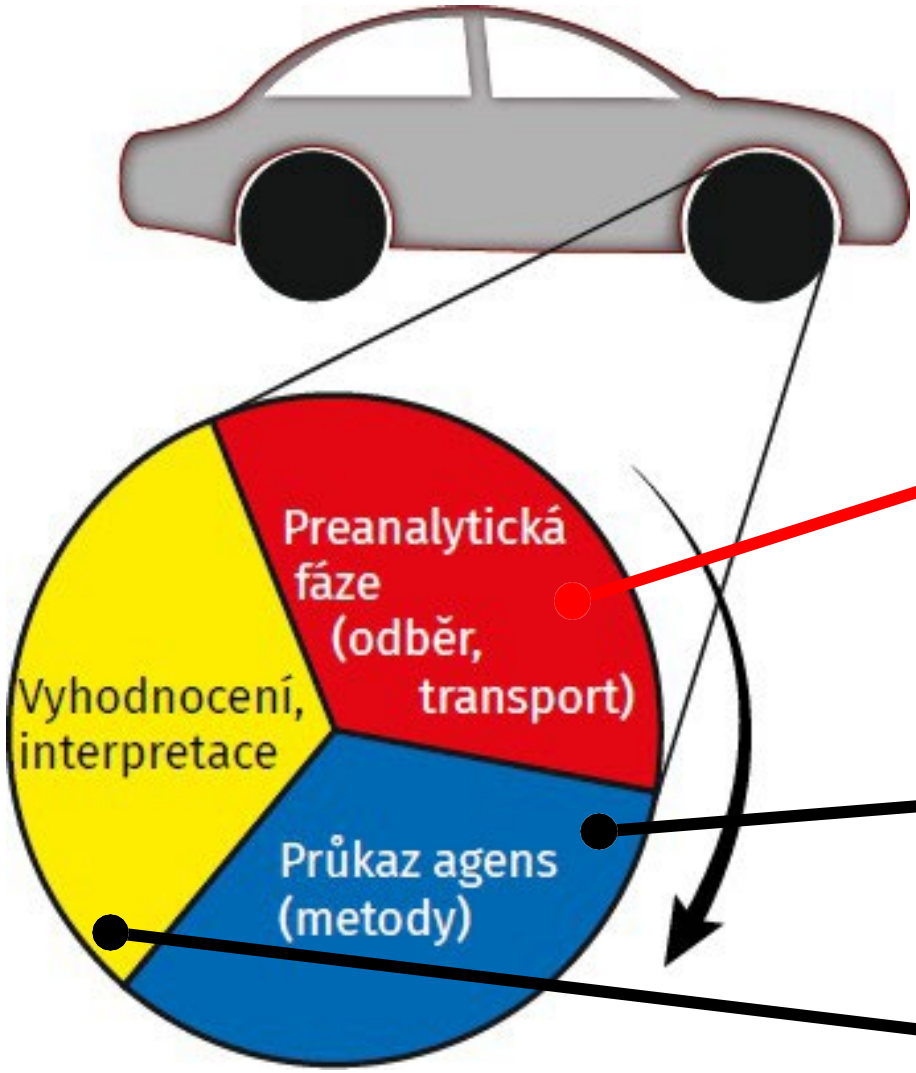
General procedure for microbiological testing (3-5)



LABORATORY PHASE

3. Pre-analytical phase

- Correct sampling technique
- Correct instruments
- Storage
- Transport

4. Analytical phase (test)

- Sample acceptance
- Laboratory processing

5. Interpretation phase

- Comparison of results with clinical findings
- Consultation

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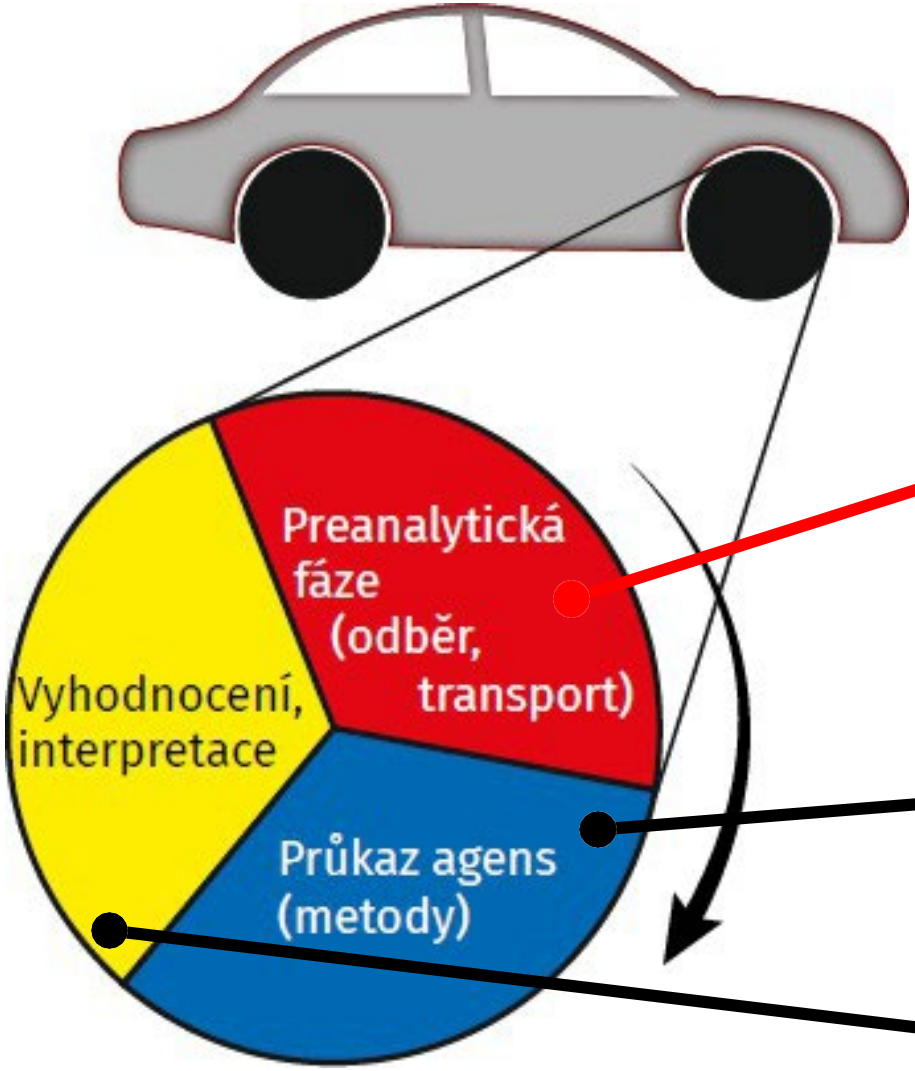
General procedure for microbiological examination (1-5)



Today's practicals

Further practical training in the summer semester

Clinical microbiology in the winter semester

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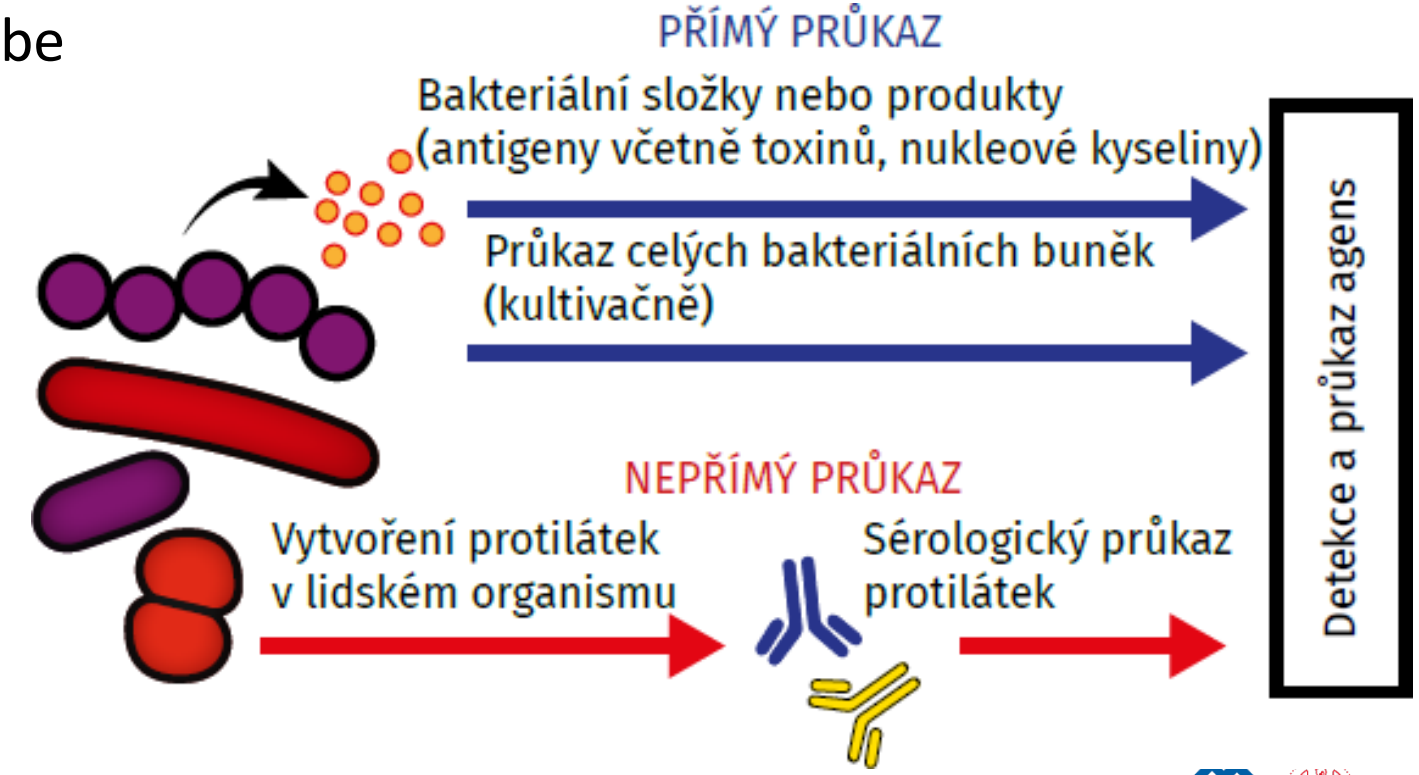
General procedure for microbiological testing

4. ANALYTICAL PHASE

DETECTION + IDENTIFICATION = **PROOF**

- Detection – capturing the microbe
- Identification – precise determination of genus/species



General procedure for microbiological testing

4. ANALYTICAL PHASE

DETECTION + IDENTIFICATION = **PROOF**

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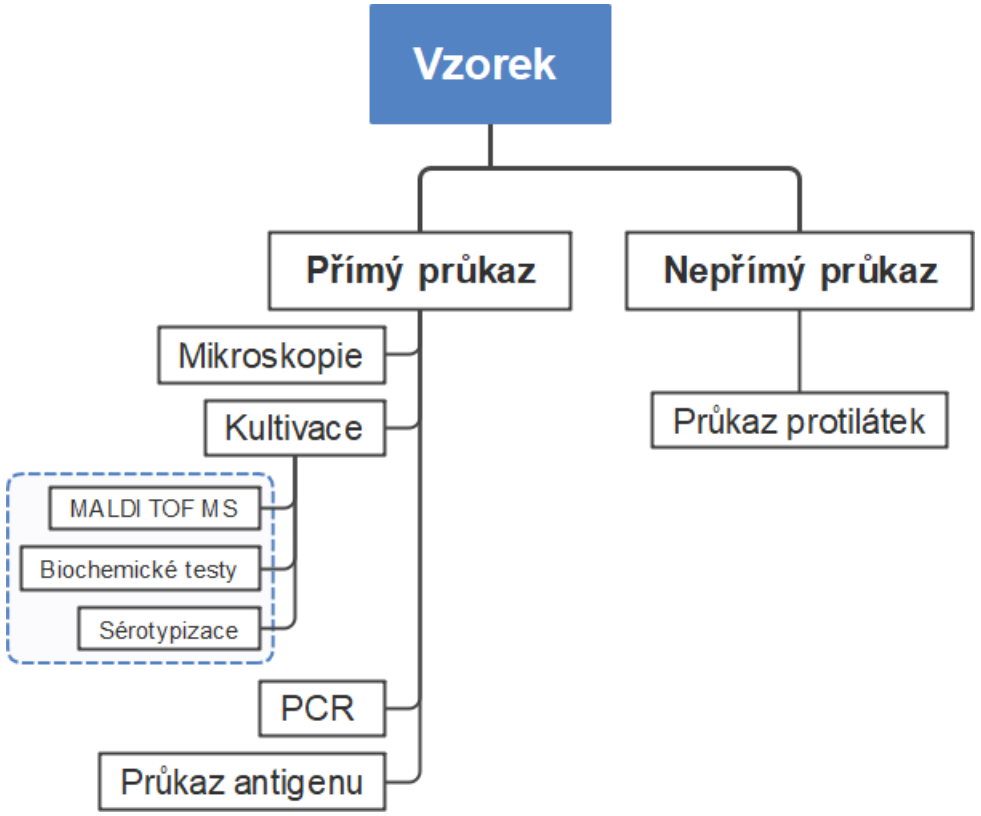

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BLOOD

Collection from venipuncture. The collection and transport tubes differ depending on the purpose of the test.

- **Coagulated blood** – the tube contains no additives; subsequent centrifugation yields **serum** for **antibody** determination or direct antigen detection. It is transported within 8 hours (at room temperature) or stored in a refrigerator for 24 hours.
- **Non-coagulated blood** – tube with EDTA (ethylenediaminetetraacetic acid) for **PCR**

- **For blood culture** – special culture bottles.

Blood cultures – what exactly are they?

- Time-defined blood sampling for BCx testing

1 blood culture = **a set of bottles** collected at a given moment, or all bottles collected as part of the diagnosis of a septic event

1 blood culture ≠ one bottle

When is it collected?

When bloodstream infection is suspected – i.e. fever may not be present!

Hurych, Štícha et al. Medical Microbiology – Repetitorium. *Triton*. 2021.

Yu, Larsson et al. Single-Sampling Strategy vs. Multi-Sampling Strategy for Blood Cultures in Sepsis: A Prospective Non-inferiority Study. Front Microb. 2019.

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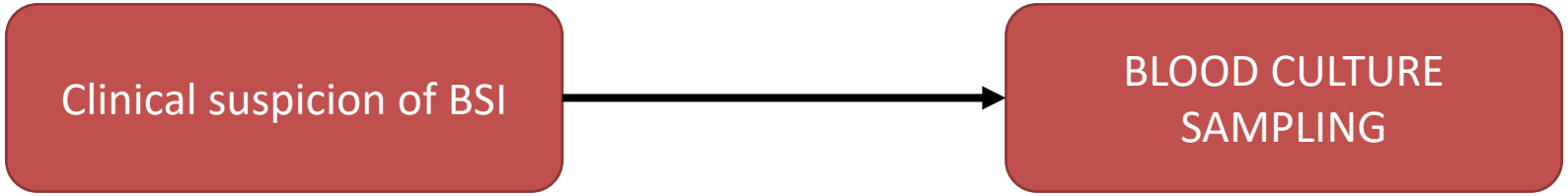
WHEN TO COLLECT

Short-term bacteraemia (<24 hours) is very rare.
Therefore, it is not important when the sample is taken (i.e. it does not have to be linked to a rise in temperature or a temperature peak).

Lamy et al. How to Optimise the Use of Blood Cultures for the Diagnosis of Bloodstream Infections? A State-of-the Art. Front Microb. 2016.



- **However, it is highly advisable to take the sample before administering antibiotics.**
- **However, the administration of antibiotics is NOT a contraindication for blood culture collection.**

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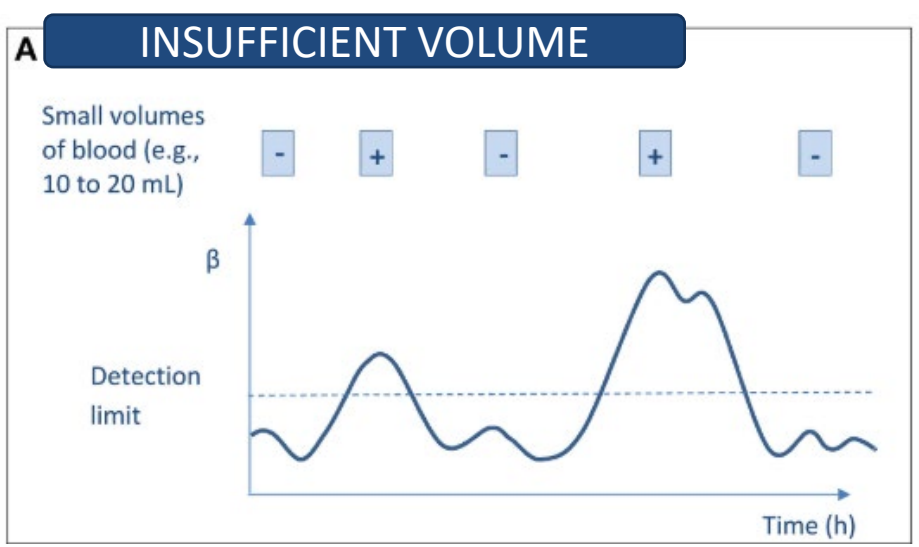
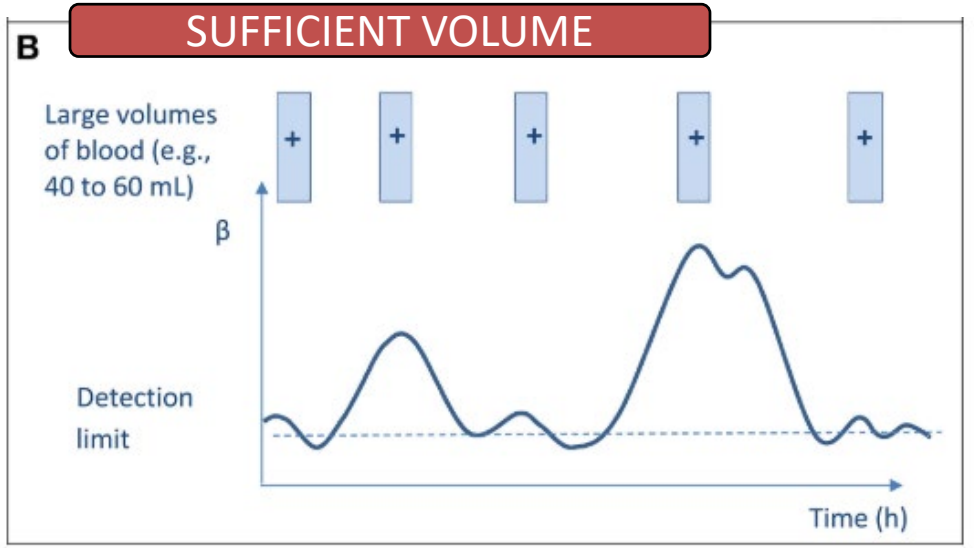
HOW MUCH TO TAKE

ENOUGH! The concentration of bacteria in the blood is extremely low, even in cases of ongoing sepsis. A critical factor in the success of blood culture testing is collecting **a sufficient amount of blood.**

Lamy et al. How to Optimise the Use of Blood Cultures for the Diagnosis of Bloodstream Infections? A State-of-the-Art. Front Microb. 2016.



Insufficient volume – **higher detection limit**, leading to uncertain detection of bacteraemia, depending on the time of collection (more random)



Sufficient volume – **lower detection limit**, leading to more reliable detection of bacteraemia, regardless of the time of collection.

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HOW MUCH TO COLLECT – SPECIFICS FOR CHILDREN

- Up to 13 kg: collect 2–4 ml of blood **into one paediatric blood culture bottle**.
- For weights between 13 and 36 kg, up to 20 ml of blood can be collected, i.e. bottles **for adult patients** can be used**.**

- From 36 kg, as for "adults" – i.e. 4-6 times the adult vial

Patient weight	Recommended total volume for a single collection	Number of bottles
Up to 13 kg	2-4 ml	**1x (paediatric)***
13.1 - 36 kg	up to 20 ml	**2x ("adult")**
> 36 kg	40–60 ml	**4-6x (adult)**

* Only a smaller volume, similar to an aerobic bottle, slightly better for the growth of pathogens: *Streptococcus pneumoniae, Neisseria meningitidis* or *Haemophilus influenzae*

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HOW TO COLLECT

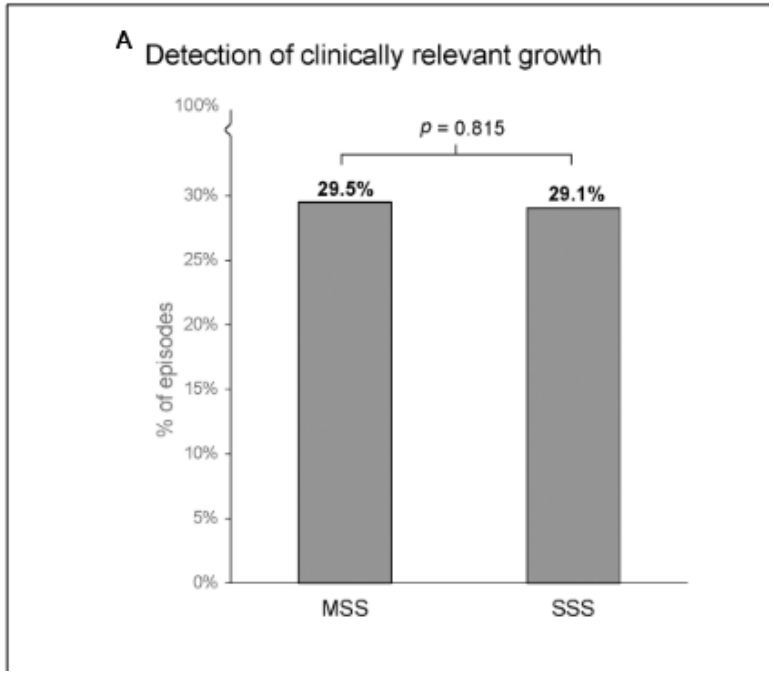
A single sample from a single puncture – **the "single-sampling strategy"**

Single sampling strategy (SSS)

- Non-inferior to repeated sampling, known as paired blood cultures (MSS)
- Lower risk of contamination
- Less invasive for the patient

Matching blood cultures (repeated sampling, MSS) increase the likelihood of detecting contaminants.

Therefore, **single sampling** is preferred



Yu, Larsson et al. Single-Sampling Strategy vs. Multi-Sampling Strategy for Blood Cultures in Sepsis: A Prospective Non-inferiority Study. Front Microb. 2019.

Does not apply to IE. Here, typically three paired blood cultures are taken, always at intervals of 12 to 24 hours apart.

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SUMMARY – HEMOCULTURE SAMPLING IN PAEDIATRICS

- Blood cultures are always collected when a systemic infection is suspected (where I expect bacteraemia – pneumonia, pyelonephritis, meningitis, osteomyelitis) – i.e. **I DO NOT WAIT FOR A FEVER**

- Hospitalisation in paediatrics ≠ collection of paediatric bottles only – **I FOLLOW THE WEIGHT**.
  - When there are multiple bottles: **one collection** – from which all bottles are taken

Weight	Number of bottles
Up to 13 kg	**1x (paediatric)**
13.1 - 36 kg	**2x (adult)**
> 36 kg	**4-6x (adult)**

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frontiers in Microbiology

ORIGINAL RESEARCH
published: 23 July 2020
doi: 10.3389/fmicb.2020.01639

Single-Sampling Strategy vs. Multi-Sampling Strategy for Blood Cultures in Sepsis: A Prospective Non-inferiority Study

David Yu[1,2], Anna Larsson[1], Åsa Parke[3,4], Christian Unge[2,3], Claes Henning[5], Jonas Sundén-Cullberg[3,4], Anna Somell[6], Kristoffer Strålin[3,4†] and Volkan Özenci[1,7*†]*

[1] Division of Clinical Microbiology, Department of Laboratory Medicine, Karolinska Institutet, Stockholm, Sweden, [2] Functional Area of Emergency Medicine, Karolinska University Hospital, Stockholm, Sweden, [3] Department of Medicine Huddinge, Karolinska Institutet, Stockholm, Sweden, [4] Department of Infectious Diseases, Karolinska University Hospital, Stockholm, Sweden, [5] Clinical Microbiology Laboratory, Södra Älvsborg Hospital, Borås, Sweden, [6] Functional Area of Perioperative Medicine and Intensive Care, Karolinska University Hospital, Stockholm, Sweden, [7] Department of Clinical Microbiology, Karolinska University Hospital, Stockholm, Sweden

OPEN ACCESS

- The single-sample strategy is non-inferior to paired blood cultures
- Lower risk of contamination, less invasive for the patient

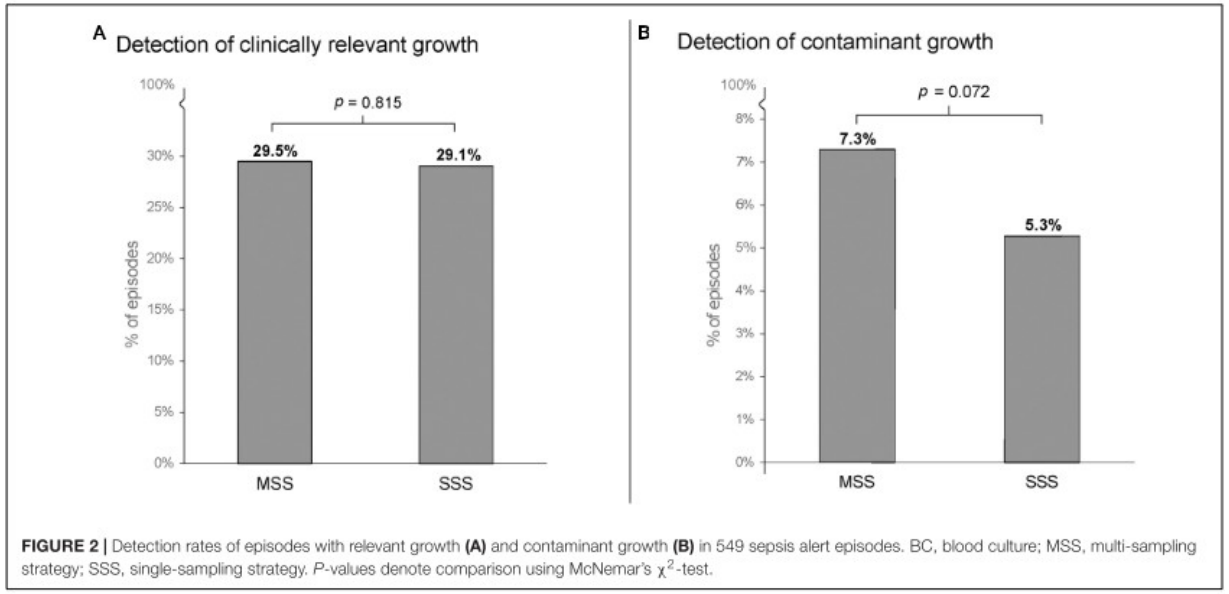

FIGURE 2 | Detection rates of episodes with relevant growth **(A)** and contaminant growth **(B)** in 549 sepsis alert episodes. BC, blood culture; MSS, multi-sampling strategy; SSS, single-sampling strategy. *P*-values denote comparison using McNemar's χ^2-test.

rate of contaminants than MSS (7.3%), although not to statistical significance ($p = 0.07$). **Supplementary Table S2b** shows the contaminants detected by MSS and SSS.

Growth in Individual Blood Culture Bottles

Growth of any microorganism was observed in 784/3,294 (23.8%) bottles. The overall contamination rate in BC bottles was 75/3,294 (2.28%). Growth in the individual BC bottles (BC1, BC2, BC3, BC4, BC5, BC6) was evenly distributed (**Table 4**).

DISCUSSION

Appropriate detection of microorganisms and low rate of contaminants are two major goals for BC diagnostics. Therefore, the sampling strategy is essential to optimize the performance of BC. In the present study, a well-defined patient cohort with clinically suspected sepsis was used to evaluate if SSS is non-inferior to MSS for detection of relevant growth in BC.

For SSS, the main concern has been that diagnostic performance may be lower than that of MSS (Lamy et al., 2016). The present study shows that SSS is non-inferior to MSS regarding detection of pathogenic microorganisms in BC. These results are the first to demonstrate this non-inferiority and confirm previous theoretical assumptions based on a statistical model by Lamy et al. (2002) and empirical data published more recently by Dargere et al. (2014). Non-inferiority of SSS compared to MSS combined with advantages of SSS in terms of less harm to the patient and less labor intensity for the staff supports the use of SSS as the routine method for BC in emergency departments.

Contamination is a major problem with BC diagnostics, and a reduction of contaminants is one of the proposed benefits of

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Cerebrospinal fluid

Cerebrospinal fluid is obtained from **a lumbar puncture** (or suboccipital puncture), but it can also be collected from external CNS drains.

Transport – sent in a test tube, can be stored **at room temperature** (note: not in the refrigerator)

It is examined not only microbiologically, but also by other methods (macroscopic appearance, cytologically, biochemically). Microbiological examination is used for **direct and indirect detection of neuroinfection pathogens.**

Upper respiratory tract

"Throat swab"
A swab of the tonsils and surrounding mucous membrane of the palatine arches is taken using a swab on a stick.
Used for direct detection of the causative agents of tonsillitis and pharyngitis (cultivation)

Nasopharyngeal swab
A curved swab on a wire is inserted through the nasal cavity to take a sample from the upper pharynx.
For virological examination, it is inserted through the mouth.
We try to avoid contamination with different microbiota from the mouth or tonsils.
Today, it is also used for PCR

Nasal swab
Using a swab on a stick.
It is only used to detect carriage of S. aureus (or MRSA).

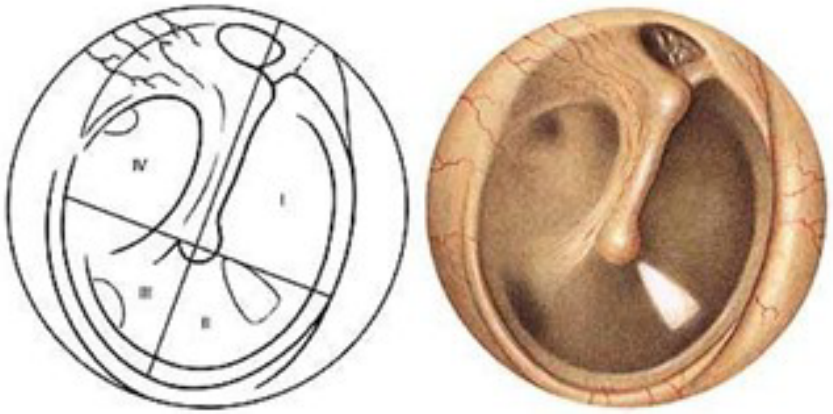
Upper respiratory tract

Paranasal sinuses
Aspiration, puncture or lavage is performed and the sample is stored in a container or an anaerobic closed system is used. Direct testing is performed – we attempt to isolate the causative agent of sinusitis by cultivation.
However, this requires **FESS (functional endoscopic sinus surgery)**.

Ear
In otitis media – examination of the contents of the middle ear cavity associated with HCD (e.g. fluid contents after paracentesis, best obtained as an aspirate or using a swab on a stick).
For otitis externa – swab the external auditory canal with a swab on a stick.

A brief reminder from anatomy

- paracentéza: dolní zadní kvadrant



Lower respiratory tract

Sputum

Collection – after oral hygiene (to prevent contamination from HCD), the patient is asked to cough up sputum, always under professional supervision (the patient must not simply spit into the container).

These are expectorated mucus samples from the lower respiratory tract, which are used in the diagnosis of pneumonia and other DCD infections.

VALID SPUTUM

- LEUKOCYTES > 25/ZP
- SQUAMINOUS CELLS < 10/HPF

Endotracheal aspirate

- Sampling from endotracheal or tracheostomy tube.

Bronchoalveolar lavage (BAL)

- Irrigation with saline solution during bronchoscopy.

Bronchial aspirate

- Suction during bronchoscopy (fibroaspirate).

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… who will have their tracheal aspirate sampled? What types of patients?

- And what about a patient who comes to your GP surgery with pneumonia?

Digestive tract

Rectal swab

- Performed using a swab on a stick, Amies transport medium is commonly used (see below).

- Used for stool culture testing for direct detection of Salmonella sp., Shigella sp., enteropathogenic and other pathogenic variants of Escherichia coli, Campylobacter sp., Yersinia sp. and Vibrio sp.

Stool (in larger quantities than from a swab)

- Collection using a spatula on the lid of the container in which it is also transported.

- Used for direct detection in bacteriology, virology and parasitology.
- In bacteriology, mainly for testing: **Clostridium difficile**, **Helicobacter pylori** (antigen detection),
- PCR and quantitative culture from stool (patients with congenital intestinal passage disorders). In parasitology, e.g.: **Schistosoma mansoni**, **Schistosoma japonicum**, tapeworms, **Dientamoeba fragilis**, **Giardia lamblia**.

Digestive tract

Gastric mucosa (or aspirate)
It is collected during endoscopy into a test tube and transported immediately.
Performed for **H. pylori** culture testing.

Aspirate or bile puncture
Anaerobic closed system,
For culture testing (infections in the bile ducts and gallbladder).

Rectal swab vs. stool sample?

	Rectal swab	Stool
Procedure		
Demanding for the patient		
Microbe yield		
Can bacteria be examined under a microscope?		
Can parasites be examined under a microscope?		
Can PCR be performed for bacteria?		

Rectal swab vs. stool sample?

	Rectal swab	Stool
Procedure	Easier	More difficult
Demanding for the patient	Easier	More difficult
Microbe yield	Lower	Higher
Can bacteria be examined under a microscope?	No	No
Can parasites be examined under a microscope?	No	Yes
Can PCR be used to test for bacteria?	No	Yes

Urine

Urine collection – how and when?

- From the middle stream
- Single-use catheterisation or from a closed permanent catheter system
- From adhesive collection bags (paediatric patients)
- From stomas
- The first portion of morning urine is collected for the detection of urogenital mycoplasmas
- The last stream is collected when prostatitis is suspected (specialised collection in urology)
- **Urine is collected in a test tube and sent within 2 hours (stored at refrigerator temperature for up to 24 hours).**

Dip-slide transport and culture systems (e.g. Uricult®)

- Transport and culture medium that is immersed in the urine sample.
- The laboratory then receives only agar with grown colonies.

Use for direct detection

- Detection of urinary tract infection – based on culture.
- Detection of Legionella pneumophila and Streptococcus pneumoniae respiratory pathogen antigens in urine.
- Currently, urine is also used for the detection of sexually transmitted diseases (e.g. Chlamydia trachomatis – previously detected from urethral secretions; mycoplasma, gonococci and other agents using PCR methods).

Reproductive system – female

Vaginal microbial picture (VMP) – no longer performed

- A smear of vaginal secretions is taken on two microscope slides using a swab on a stick.
- Microscopic preparations are sent after drying and can be stored for a maximum of 48 hours.

Vaginal swab

- Using a swab on a stick.
- E.g. direct evidence: *Neisseria gonorrhoeae, Gardnerella vaginalis, Candida sp., Streptococcus agalactiae*

Cervical smear

- Using a swab on a stick.
- E.g. direct detection: *Neisseria gonorrhoeae, Gardnerella vaginalis, Chlamydia trachomatis, urogenital mycoplasmas* (requires epithelial abrasion and special transport medium)

Aspirate or punctate

- Fluids from the adnexa, uterine cavity or Bartholin's gland (glandula vestibularis major)
- Anaerobic closed system
- E.g. direct detection of *Neisseria gonorrhoeae*

Examination of intrauterine device, which is sent in a container.

Reproductive system – male

Urethral secretion

- Swab the urethra with a wire-tipped swab in transport medium or inoculate using a bacteriological loop on chocolate agar.
- E.g.: Neisseria gonorrhoeae, Candida sp., urogenital mycoplasmas

Prostatic secretion

- In a test tube or urethral swab after prostate massage.
- E.g.: Neisseria gonorrhoeae, urogenital mycoplasmas

Ejaculate (urogenital mycoplasma)

PCR from urine!

Slightly lower yield, but much greater comfort and adherence!

Buckley C, et al. Real-time PCR detection of Neisseria gonorrhoeae susceptibility to penicillin. J Antimicrob Chemother. 25 July 2016.

FN MOTOL 2 LF UK

Primarily sterile cavities and pus

- site of infection: e.g. abdominal, chest, synovial, pericardial

- specimen

- aseptically collected as large volume as possible by needle and syringe (air should not be injected into culture bottles - inhibit growth of anaerobes) - transport system – sterile screew capped tube (for Gram staining) or blood culture bottle with medium

1. MICROSCOPY	2. CULTURES	3. PANBACTERIAL PCR

General conditions for specimen collection & transport

	conditions	temperature*
bacteria	swab & transport medium	RT
viruses	swab, fluid, tissue transport m.= culture m.	4 - 8°C
parasites/eggs	collection 3x (every other day) container / tube	RT (storage 4 - 8°C up to week)
anaerobes	fluid, tissue (avoid contact with oxygen)	RT
fastidious bacteria	special conditions (e.g. *Neisseria* spp.)	various (*Neisseria* – if delay store and transport them frozen)

Note: * RT room temperature

Workplace tour

- Remember everything!

- Take a look at BD Bactec so you don't burn out on blood cultures.