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Theme used for the reference	5.4 Preanalytical procedures

History of the modifications

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Reason
chapter 3: microbiologie

Reference	Distributed on	Archived on
LR-PREA-V002.09-0	26-08-2022	05-04-2024

Table of contents

1. General recommendations

Pre-analytics summarises all processes occurring **prior to** the actual lab testing, that is, preparation, gathering of patient information, the collection of the biological specimen, and the following storage and transportation of the specimen samples for analysis. Knowledge and observance of pre-analytical features and/ or interfering factors are of central importance for the quality of the analysis results.

1.1 Sample collection/ Transport containers:

Sample kits are provided free-of-charge by the laboratory and they are also available in all blood collection centres. Opening hours and locations can be found at www.labo.lu or by contacting us under the below details:

LABORATOIRES RÉUNIS
38, rue Hiehl
Z.A.C. Laangwiss
L-6131 JUNGLINSTER
Tel.: +352 780 290 1
Fax: +352 788 894
info@labo.lu

1.2 Analysis request (Ordonnance):

Samples and analyses requests must be clearly assigned to the correct patient. The patient's full name and the date and time of collection should be written **clearly** on the specimen container and on the request form.
The specimen containers (e.g. urine cups, stool containers) should not be labelled on the lid or seal.
The required analyses must be indicated on the analyses request.

Please do not forget to note relevant information for the results interpretation on the request form e.g.:

- Region of the sample collected
- Presumptive diagnosis
- Other relevant findings
- Information about medication, e.g. an antibiotic or anticoagulation therapy
- Other features

Those details are of enormous significance, especially for *microbiological* or *cytological* lab tests.

1.3 Additional requests

Original samples are stored for a set period of time to enable the processing of the lab tests requested.
Storage takes place at the temperature conditions stipulated for the type of sample and is regulated in different ways depending on the type of test and also legislative specifications.
Furthermore, aliquots can be frozen for one month at the written request of the physician.

Additional tests can be also requested by the sender by phone prior to sending the obligatory analysis request by fax. When processing an additional request, the pre-analytical conditions for the relevant analysis are taken into consideration and can only be carried out in the context of the given sample stability. If necessary, the patient may have to provide another sample.

Step-by-step diagnostics:

For accounting purposes, we ask our physicians – within the framework of serological step-by-step diagnosis of infections (positive result for IgM –or IgG antibodies) – to request specific confirmatory tests via a separate ordonnance or to provide this on demand.

1.4 Declaration of consent:

Following tests may be carried out only with the patient's written declaration of consent:

- Genetic testing
- Sperm-related investigations (for insemination)
- Non-refundable laboratory tests

When sending in a request for genetic analyses, a declaration of informed consent signed by our national or international patients must be enclosed to the samples.

2. Specimen samples for analyses

2.1 Venous blood samples

2.1.1 General recommendations for blood collection

Fasting at least 12 hours prior to collecting samples is advisable. No excessive physical activity during 3 days prior to blood collection. Please indicate on the medical prescription if patient is taking medication (anticoagulation therapy)

Following parameters may impact the test results:

- Daytime
- Body positioning
- Sex-, ethnic background- and genetic based differences
- Age, lifestyle, pregnancy
- Diet, smoking
- Stress, physical activity, alcohol, medication

2.1.2 Different collection tubes

1) Hemoculture (not performed for the moment)

2) Citrate 

3) Serum  or 

4) Heparin 

5) EDTA 

6) Fluoride 

2.1.3 Detailed information about pre-analytical procedures

Order of the blood collection containers:

- Blood culture
- Whole blood (serum)
- Citratblood
- Heparinblood
- Lithium-Heparinblood

- EDTA blood
- Sodium-fluoride blood
- Other

Respect filling quantities, especially for citrated blood. Observe exact filling and mixing proportions.

Special features

The **venous stasis** generated for obtaining a blood sample **should not exceed 60 seconds.** If the blood flow is not sufficient during collection, the tourniquet can be reapplied.

Place the tourniquet approx. one hand's width (10 cm) above the puncture site.

Tap the vein before disinfecting in order to locate a suitable place.

Spray the disinfectant on to the puncture site and leave it to take effect for 30 seconds.

Wipe once with the swab.

Put on gloves before the puncture procedure at the latest:

Lock in place by turn the cannula and mount into the holder.

Pierce the skin at an angle between 20°-30° and puncture the vein, holding the tip of the cannula in such a way that the opening is facing upwards.

Position the first tube and release the tourniquet.

Withdraw the last tube before removing the cannula from the vein.

Compress the puncture site with a swab immediately after removing the cannula from the vein.

The normal clotting time is between 2-4 minutes. Do not bend the affected arm during compression as this can lead to renewed stasis of the vein and therefore to haematoma.

Press the puncture site of patients who are undergoing anticoagulant therapy for a correspondingly longer period of time.

Do not use alcohol containing disinfectant for alcohol determination in blood.

Use originally closed tubes for serological diagnoses of viral infections.

Serum

- Collect venous whole blood without additives
- Wait and let coagulate for 30 minutes
- As whole blood upright storage at room temperature until shipment takes place
- Centrifuge as a serum
- General storage: store in the refrigerator until shipment takes place

Specimens that require immediate centrifugation after coagulation and separation of the serum to measure following parameters:

Bilirubin	Calcitonin *Freeze specimen at (-20°C) immediately after centrifugation*	Cholinesterase	C-Peptide	Folic acid
Glucose	Insulin	Calium	Lactate	LDH
Lithium	Myoglobin	Phosphorus	Vitamin B12	Potassium

EDTA

EDTA blood for following analyses:

KRL test (anti-radical resistance)	Blood typing[1]	BSG	Genetic testing[2]
Glutathionperoxidase	HbA1c	PCR analysis	Reticulocytes
Superoxide dismutase	Blood group	Coombs test	Antibody identification test

[1] Due to the instability of cellular components, blood count must be analysed on the same day of blood collection.

[2] Detailed guidance on sampling for genetic tests Refer to § 1.8 under *Genetic analyses*.

EDTA Plasma blood for following analyses:

- Fill appropriate EDTA tube with whole blood, mix gently and centrifuge
- Transfer plasma in neutral tube

ACTH	Adrenalin	Coenzyme Q10
Dopamine	Noradrenalin	

Citrated blood

Citrated blood for following analyses:

- Fill the tube completely (in order to guarantee the correct ratio of anticoagulants and blood).

AT3	Fibrinogen	PDF/ D-Dimer
Prothrombin	Time of thrombin	Protein C
Protein S	APC resistance	Partial thromboplastin time

Sodium-Fluoride Blood

Sodium-Fluoride blood for following analyses:

Glucose	Lactate

Lactate analyses:

- No venous compression
- Wait for 15 minutes after blood withdrawal
- Centrifugation
- Transfer in neutral tube and refrigerate
- Freeze at -20°C

Lithium-Heparin-Plasma

The following analyses are made from lithium heparin plasma:

- Centrifuge the **lithium heparin** blood immediately after drawing
- Pipette the supernatant into a separate tube without anticoagulants
- **Freeze plasma immediately**

Vitamin C	

Lithium-Heparin Blood

Lithium-Heparin blood for following analyses:

Glutathionperoxidase	Superoxide dismutase

2.1.4. Storage and transport of blood collection techniques:

All blood collection tubes should be kept at room temperature.
Blood samples should be to Laboratoires Réunis as soon as possible.
Exceptions:

- **Serum** should be stored in the **refrigerator** after centrifugation (excepted for LDH)
- **Lactate and calcitonin: Freeze specimen at -20°C immediately after centrifugation**

Never use blood collection tubes after the expiry date (labelled on the tube).
Protect from direct sunlight.
Packaging for the transport of frozen samples

For the transport of frozen samples coming from the blood collection centers, special containers from Sarstedt are used. According to the manufacturer's (Sarstedt) specifications a frozen transport is ensured for a time period of 12h.

Light sensitive parameters:

- Sample tubes should be packaged with opaque outer packaging or not exposed to sunlight

Bilirubin	Coenzyme Q10	Folic acid (Vitamin B9)
Vitamin A	Vitamin B12	Vitamin D3
Vitamin E	Vitamin C	

2.1.5. Glucose tolerance test:

The OGTT is the standard test for diagnosing IGT (impaired glucose tolerance) and describes the postprandial glucose level. This level is disturbed in cases of prediabetes and diabetes. The American Diabetes Association recommends taking FPG (fasting plasma glucose) as a screening test for prediabetes and diabetes, and an increased value is classified as IFG (impaired fasting glucose)[1]. The OGTT is recommended for confirming an IFG and for the diagnosis of gestational diabetes. In Europe, the OGTT is favoured as a screening test for prediabetes and diabetes, as IFG and IGT can be determined in one investigatory step.[2]

[1] Report of the Expert committee on the diagnosis and classification of diabetes. Diabetes care 1997;
[2] WHO Definition, diagnosis and classification of diabetes mellitus and its complications: Report of a WHO consultation; Geneva 1999

2006 WHO diabetes criteria and classification:[3]

Classification	Fasting blood glucose (venous sample)	Blood glucose in OGTT after 2h (venous sample)
Normal	<110 mg/dl <6.1 mmol/l	<140 mg/dl <7.8 mmol/l
Impaired fasting glucose (IFG)	≥110–<126 mg/dl ≥ 6,1–<7,0 mmol/	< 140 mg/dl < 7,8 mmol/l
Defective glucose tolerance	<126 mg/dl <7,0 mmol/l	≥140 – < 200mg/dl ≥7,8 – <11,1 mmol/l
Diabetes mellitus	≥126 mg/dl ≥7,0 mmol/l	≥200 mg/dl ≥11,1 mmol/l

Preparation of the patient before and during the test:

At least 10–16 h abstinence from food and alcohol
At least 3 days of eating foods rich in carbohydrates (≥ 150g Carbohydrates/ Day)
At least 3 days' discontinuation of disruptive medication, where this is possible
At least 3 days before and after end of menstruation
Performance of the test sitting or lying down (no muscle exertion)
No nicotine abuse

Variables influencing glucose tolerance:

Hyperlipoproteinemia	Liver cirrhosis	Metabolic acidosis	Long periods confined to bed
Overactive thyroid	Pregnancy	Potassium deficit	Heart failure
Degree of hunger	Stress	Saluretics	Corticosteroids
Hormonal contraception	Laxatives	Nicotinic acid	Nitrazepam
Phenothiazines	Phenacetin	Thyroid hormones	Non-steroidal anti-inflammatory drugs

For further information, please contact us.

2.2 Urine samples

Reliable results from urine analysis can only be obtained if collection, transport und storage of the urine are properly conducted. Please check the analysis brochure to find out the adequate sample quantity.

The following urine samples can be differentiated according to type and time:

[3] Definition and Diagnosis of Diabetes Mellitus and Intermediate Hyperglycemia in: World Health Organization S. 36. 2006.

2.2.1 Midstream urine

Midstream urine can be categorised into morning and spontaneous urine:

First morning urine:

The first morning urine specimen is the first urine voided upon rising. It is the best sample for routine urine analysis, because it is usually concentrated and more likely to reveal abnormalities.

Suitable for:

Bacterial testing	Urine analysis
Protein diagnostics	Clinical-chemical investigation

The second morning urine is less concentrated than the first morning urine and is suitable to determine average values of different parameters.

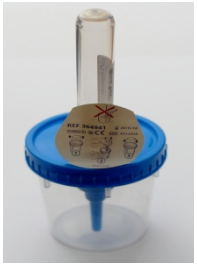
Spontaneous/Random urine collection

A random urine specimen is urine voided without regard to the time of day or fasting state. This sample is satisfactory for most routine urine analysis

Guidelines for collecting midstream urine:

The hands are washed and cleaned with a single use towel. Men clean thoroughly the penis gland by full retraction of the praeputium. Women clean their vulva with water and keep their vulva distended during the whole procedure. Do not use disinfectant solution or soap.

Clean and sterile sample collection devices, especially made from plastic, are to be used exclusively as sampling vessels for urine.



Closing direction: to the right (clockwise)

- Open the urine receptacle and take off the lid with the inner side facing upwards.
- The first urine jet (circa 50 ml) is eliminated, and then 20 ml are collected in a sterile urine tube. It is important not to stop during the procedure and to urinate continuously.
- Put the lid of the urine container on straight and turn it as far as it will go in the direction of the arrow. This way the vessel is secure and liquid-tight.

Interfering factors:

- Erythrocytes, e.g. during and 2- 3 days after menstruation
- Increase in cellular components and proteins due to vaginal or prostate/ semen secretion (e.g. after sex)

Sample stability and transportation of midstream urine:

A storage and journey time of **max. 6h at temperatures of 4- 8°C** should not be exceeded.

Numerous components contained in urine are instable (e.g. cylinders, leukocytes, erythrocytes) and their detection is no longer possible after a few hours or may also falsify the measured values. The alkalization of the urine, caused by rapid multiplication of bacteria, encourages the disintegration of cellular urine components in the urine sample that has been collected, which will affect the assessment.

Therefore: the shorter the storage and journey time, the more meaningful and accurate the results. Prompt processing of urine samples are of particular importance, a second (fresh!!) morning urine sample is preferable to a first urine sample from the morning that has been brought along.

Special features in urine collection:

Urine drug testing:

- Check identity card
- The obtained specimen is authentic i.e. it has been freshly voided by the patient under supervision
- Check temperature and colour of the urine sample
- No subsequently adulterated or substituted

Bladder schistosomiasis (Schistosoma haematobium):

In cases of suspected infection caused by schistosoma haematobium (bladder schistosomiasis), **midstream incl. final urine** (last urine portion) is recommended. Furthermore, the detection rate of excreted eggs can be increased by taking a **urine portion of approx. 400 ml**. The time of maximum egg shedding lies between 10:00 and 14:00 o clock.

Alternatively, a 24 hour urine can be sent in (Investigation carried out by sedimentation).

Uricult consists of culture slide covered on both sides with agar. The inoculated slide is inserted into the tube where it can be incubated, stored or transported. Immediate transport to the laboratory or storage at 2-8 °C for 24 hours.

2.2.2 First stream:

The collection starts in the morning after the first micturition and ends after 2 hours.

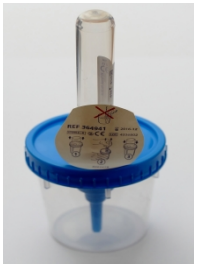
Particularities:

Chlamydia trachomatis	Trichomonas vaginalis
Neisseria gonorrhoeae	Mycobacterium tuberculosis

Guidelines for collecting first-void urine:

The hands are washed and cleaned with a single use towel. Men clean thoroughly the penis gland by fully retraction of the praeputium. Women clean their vulva with water and keep their vulva distended during the whole procedure. Do not use disinfectant solution or soap.

Clean and sterile sample collection devices, especially made from plastic, are to be used exclusively as sampling vessels for urine.



Closing direction: to the right (clockwise)

- Open the urine receptacle and take off the lid with the inner side facing upwards.
- The first urine jet (50 ml) is collected and the rest is eliminated.
- Put the lid of the urine pot on straight and turn it as far as it will go in the direction of the arrow. This way the vessel is secure and liquid-tight.

Sample stability of first-void urine:

Neisseria gonorrhoea:

The sample should be transported to the laboratory **within four hours** of collection due to the sensitivity of the pathogens to external influences and stored at room temperature until transportation.
Molecular biological detection is also possible even if the recommended journey time is exceeded; the sample can be kept refrigerated overnight.

Chlamydia trachomatis

Molecular biological detection is also possible even if the recommended journey time is exceeded; the sample can be kept refrigerated overnight.

Trichomonas vaginalis

The journey time of one hour should not be exceeded and must take place at room temperature in order to detect living organisms. Molecular biological detection is also possible even if the recommended journey time is exceeded; the sample can be kept refrigerated overnight.

Mycobacteria

The sample should be transported to the laboratory **within two hours** of collection. If immediate dispatch to the laboratory is not possible, store the sample at + 4 °C in the refrigerator for a maximum of 24 hours.

Important

- Collect at least 30 ml morning urine. No midstream urine and no urine collection
- If possible, do not drink too much in the evening before collecting the morning urine
- Do not collect the sample from a urinary bag
- Collect at least 3 samples preferably on 3 different days
- Send the sample in a sterile vessel

2.2.3 Collection of 24 hour urine

The collection starts in the morning after the first micturition and ends the next day after the first micturition.

The collection starts in the morning after the first micturition and ends after 2 hours (just for Addis-count).

The urine specimen should come from a well-mixed total urine probe. The total amount of urine should be indicated.

For special examinations (e.g. catecholamine), preservatives (HCl) have to be added to the urine.

Guideline for collecting 24 h urine

A **patient guideline** for collecting 24 hour urine is handed out together with the specimen container and is available in the blood collection centres or can be requested via telephone or email (For addresses and telephone numbers see page 3).

Store the bottle in the refrigerator and protect from light.

If the clearance is determined, note the serum creatinine concentration, the patient's bodyweight and the body size.

Empty your bladder in the morning after getting up. This urine is not collected.

- From then onwards, **each urine portion** – even those during stool movements- will be completely collected with the aid of a **receptacle** and transferred to a storage tank without loss (be careful not to burn yourself; acid is contained in the containers with the green lid).
- The urine specimen should come from a well-mixed total urine probe.
- On the following morning i.e. exactly 24 hours after the start of the collection period, collect the first urine portion and empty it out in to the storage tank.
- The total amount of urine should be indicated.

Interfering factors:

The measured values of several parameters, e.g. catecholamine may be disrupted by the consumption of certain foodstuffs or the intake of specific medication. Further information on which foods should be avoided can be found in the patient guideline which is handed out together with the sample containers and in the blood collection centres or is available upon request.
Medication should not be discontinued without authorization.

Sample stability of 24 h urine:

The urine that has been collected should be transported to the laboratory as quickly as possible, and the temporary storage should be cool. Further details on the stability of the individual parameters can be found in the analysis brochure.

Particularities:

2 hour collection urine for Addis-count:

The collection starts in the morning after the first micturition and ends after 2 hours. Keep urine cool during collection.

Procedures for 2 h or 3 h urine collection:

For collecting urine, a suitable storage tank will be provided by the laboratory. After a period of thirst of approx. 12h, the patient may take some fluids after emptying the bladder; thereafter the urine passed in the course of the next 2-3 hours is collected.

Sample stability 2 h to 3 h urine

Cellular components are only stable for a short period of time (< 6 h). For this reason, prompt transport to the laboratory is recommended.

2.2.4 Urine culture

The first morning midstream urine is the test material of choice for the diagnosis of bacterial urinary tract infections. For collection see 2.2.1 midstream urine.

A culture is only carried out on explicit request.

Sample stability of urine for urine cultures

The urine obtained should be kept refrigerated between 4-8°C before processing. The sample stability of the cooled urine samples is 24 h.
The bacterial count, seen as an important criterion for a urinary tract infection, may increase due to the multiplication of germs because of improper storage of urine. If cooling is not possible, we recommend performing a urine culture immediately using a dip media/dip slide (Uricult) (see below).

Information and interference:

- For the detection of a urinary tract infection, a urine sample should be taken before the introduction of an antibiotics therapy.
- Check-ups should be carried out three days after completion of the antibiotic treatment at the earliest.

Procedure for 'Uricult' preparation

- Unscrew the end cap with the attached growth medium carrier (without touching the agar surfaces).
- Dip the growth medium into the freshly passed midstream urine until the agar surfaces are completely covered. Allow excess urine to drain from the growth medium carrier.
- Push the end cap with the growth medium carrier into the Uricult tube und screw the end cap tightly.
- Send the growth medium to the laboratory for incubation.
  Incubated growth medium may be stored for a maximum of 24h at room temperature.

Features

For the diagnosis of specific bacterial infectious agents e.g. neisseria gonorrhoea see 2.2.2. first- void urine

2.3 Faecal samples

The stool examination encloses:

- Confirmation or exclusion of enteropathogenic agents (bacteria, viruses, parasites)
  (See the table "Standard requirement: Pathogens & Resistance")
- Quantitative composition of physiological gut microbiota
- Immunological parameters (inflammatory tests, detection of elastase)
- Colon cancer prevention

Following parameters are determined in the stool:

- Stool samples should be taken on three subsequent days with an adequate clean stool container.

- If the abscess is open, use a sterile sharp spoon and transfer the material in a transport tube.
- Conspicuous stool components (slime flakes or bloody components...) are to be transferred to the sample tube. Due to intermittent excretion of some pathogens/ parasites, it is recommended to carry out the test using three samples from three different bowel evacuations.

Storage/transportation of stool samples:

Samples should be transported to the laboratory as soon as possible. It is acceptable to store the sample on an interim basis for a maximum of 24 h if refrigerated between 4-8°C.
Under no circumstances should several stool samples firstly be collected and then brought to the laboratory.

In cases of suspected **Vibrio spp**, a storage and journey time however of **altogether 4h at room temperature** should not be exceeded.

For the detection of protozoa (**vegetative forms),** a completely fresh stool material (not older than 30 min) should be used. We would ask you to consult us on this first.

Particularities:

If Enterobius vermicularis is suspected, take a transparent tape (the best is to do it before the first defecation and first shower in the morning) and do a peri-anal swab. Scotch the tape on the slide. A new and safer method for the detection oxyuri is the anal swab with a special kit obtained in the laboratory.

The *Prevent ID CC rapid test* detects due to specific anti-human haemoglobin antibodies merely human haemoglobin. That is why this test cannot be influenced by foods and no special diet is requested. To get a trustworthy result following precautions should be followed: No sampling during the 3 days after the menstruation. The procedure should be avoided in patients with gingival bleedings, bleeding haemorrhoids, haematuria. Alcohol, aspirin, and other medications in excess are associated with gastrointestinal irritations and sometimes lead to bleedings and therefore they should not be taken 48 hours before testing. If the test is not performed the same day, the tube should be stored between 2-8°C.

2.4 Secretion and swabs as test material:

2.4.1 Material from the respiratory tract:

In the examination of sample material from the respiratory tract, **physiological oral and pharyngeal microbiota** are normally detected which must be taken into consideration in the interpretation of the results. Aside from coagulase-negative staphylococcus, viridans streptococci, apathogenic corynebacteria and apathogenic Neisseria; staphylococcus aureus, streptococcus pneumoniae, Haemophilus influenzae and Neisseria meningitidis are detectable in small numbers and under no circumstances equate to an infection.

The material should be collected using a sterile procurement device; contamination is to be avoided at all costs. Swabs and suitable specimen containers for secretion will be made available free of charge.

Microbiological testing should always be done prior to starting antimicrobial therapy, as otherwise false negative or only results of limited significance can be achieved. If this is not possible, sampling immediately prior to the next administration of antibiotics, at the end of an interval, is recommended.

Guideline for collecting material from the respiratory tract

Sputum:

Since sputum is almost always contaminated with microbial flora from the mouth and pharynx, the proper way to collect sputum should be explained to the patient. It is recommended to make particular reference to the difference between sputum and saliva. Saliva is generally unsuitable for the study.

Morning sputum gives the best material. Do not use any disinfection solution. Sputum collection should be performed under medical supervision.

- Flush previously the mouth with tap water (not if there is a suspicion of mycobacteria as the water can contain atypical mycobacteria)
- Optimal results are obtained if the period between collection and analysis is very short. Storage: refrigerator.

Tracheal- and bronchial secretions:

Aspiration of secretion from deep sections of the bronchial tree after switching the endotracheal tube or via a working channel of the bronchoscope, and if necessary swabs with a brush.

Due to the lower risk of contamination with physiological oral and pharyngeal microbiota; tracheal or bronchial secretion of sputum is preferable from a diagnostic point of view.

Transfer the collected secretion into a sterile specimen container with a screw cap.

Secretion from paranasal sinuses:

Collection of material by rinsing with Ringers Lactate Solution

Swabs:

The material should be taken by sight directly from the location of the infection. If there are coverings, these should be raised or removed with a sterile swab. Contamination with surrounding microbiota should be avoided wherever possible.

Universal swabs with Amies media (ESwab, Liquid Amies Elution Swab) are suitable for microbiological and molecular biological investigations.

(large brush)

(small brush)

Throat, tonsil, and pharyngeal swabs*:*

(Caution: only in cases of a non-inflamed epiglottis, otherwise there is danger that the airways will be obstructed)

- Clean the mouth with tap water.
- Press tongue down with depressor and remove material from infectious parts of the tonsils, of the palate and the pharynx region by pressure or gently pushing on the respective parts.

Nose, nasopharyngeal swabs:

- Insert swab max. 2 cm in to the nostril
- The head of the patient has to be titled back. Insert swab through nostril to posterior nasopharynx until a distinct feeling of resistance. Rotate swab a few to obtain infected cells.

Ear canal and middle ear:

- Disinfect the outer ear before extraction. Avoid contamination of the swab with germs of the outer ear area
- Try to extract directly from the infectious area

Mouth, tongue, and cheek swabs:

- The patient should have no food or drink 20 minutes prior sampling.
- Collection should be performed avoiding contamination.
- Take a swab from the infectious area.

Saliva samples:

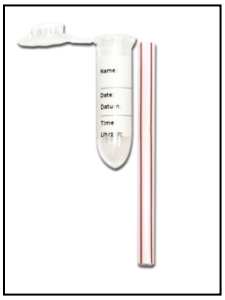
Saliva samples are used for the detection of **steroid hormones**. The hormone analysis from saliva is of particular significance, because the biologically active and free component is systematically measured.
Saliva samples are **generally unsuitable for microbiological diagnosis.**

Guideline for collecting saliva specimens

The sample collection vessels are provided free of charge by the laboratory.

Our test kits contain:

- 5 collectors made from highly purified polypropylene with a holding capacity of 2 ml each.
- Straw for transferring the saliva from the oral cavity to the vessel.
- Self-adhesive labels for labelling the individual samples.



- Saliva should be transferred to the plastic vessel with the aid of a small straw. Avoid formation of foam.
- Each receptacle should be filled to at least 25% - or even better 50%.
- No blood may be mixed in with the saliva. Even if the saliva has a slight red tinge it is to be discarded; rinse the vessel with tap water and repeat the collection process after 5 – 10 minutes.

If not directed otherwise, **please collect the saliva samples in the first two hours after waking up.**

- To do this, take sample one immediately after waking up,
- Take the additional probes at intervals of 30 minutes.

(Fluctuations of up to 10 minutes can be tolerated).

For the detection of cortisol it may be necessary to take a saliva sample **also in the evening**. For this we recommend taking three samples in the morning and another two in the evening

- The first sample in the morning 30 minutes after waking up.
- Then take sample two and three at 30 minute intervals.
- Please take the two evening samples 60 min and shortly before falling asleep

Important information:

Before or during the sampling period:

- Do not consume any animal products. The last dietary intake of animal products must be at least 12 hours beforehand.
- Pure vegetarian foodstuffs may be consumed in small portions up to an hour before the sampling period.
- Drinking water is permitted.
- Rinse the mouth thoroughly with water before the start of the sampling period in order to remove any leftover foodstuffs.
- Do not smoke at least 30 minutes before sampling.

Sample stability and transportation:

Secretion and swabs for microbiological testing:

The samples should be transported to the laboratory immediately after collection due to the sensitivity of several pathogens to external influences. Secretion should be kept refrigerated at temperatures of 4-8°C (maximum 24h) during interim storage until transportation. Swabs can be kept at room temperature for a maximum of 48 hours.

Long transport times impair the accuracy of the determination of the germ count. Particularly sensitive pathogens may no longer be culturally detectable.

Saliva samples:

During a sampling period, storage of saliva samples at normal room temperature, even at the height of summer, is harmless. If saliva samples are stored for longer than a day, it is recommended to store them in the refrigerator or, better still, in the freezer.

Mycobacteria

The expectoration sample should be delivered to the lab within 2 hours after collection. When transport cannot take place within 2 hours, the sample must be stored at 4° C in the fridge up to 24 hours.

Important
- Quantity: 2 – 5 ml
- Cough hard until expectoration comes up in the mouth
- First morning expectoration is especially appropriate
- Avoid contamination with saliva
- No mouthwash before collection
- Collect at least 3 samples preferably on 3 different days
- Send the sample in a sterile vessel

2.4.2 Material from punctures:

Liquid test material such as ascites or pleural punctates, pus, secretions, and drained fluid are generally preferred for microbiological investigations than swabs.

Microbiological diagnosis should be performed prior to the beginning of the antibiotics treatment in order to ensure that the results are meaningful.

Guideline for collecting liquid materials

Disinfect the skin surface at the puncture site, strictly observe the time needed for it to take effect and then carry out a second disinfection.

It is recommended to send in the liquid materials in appropriate sterile containers with a screw cap (do not put a swab on to the material that has been removed). Suitable sample transport containers will be provided upon request.

In case of suspected obligate anaerobic bacteria, it is recommended to leave the aspirated material (approx. 10- 20 ml) in the syringe after removing air bubbles and to replace the cannula with a seal plug in order to avoid any contact of the sensitive pathogens with oxygen.

Sample stability and transportation:

The prepared sample should be transported to the laboratory preferably directly after collection. Interim storage until transportation should be kept refrigerated at 4-8°C.

Special features

In cases of **abscesses**, it can be assumed that the infectious agents are at the perimeter or the wound base of the abscess. Here a swab is preferable to liquid material. This should be taken from these locations after superficial coverings have been carefully removed.

2.4.3 Material from skin, mucous membrane and appendages:

Skin and mucous membranes are densely populated with bacteria of physiological microbiota e.g. coagulase-negative staphylococci, non-pathogenic corynebacteria and propionibacteria, which must be taken into consideration with the sampling (contamination danger) as well as the interpretation of findings.

Guideline for collecting wound material

Open wounds rich in exudate:

Superficial coverings should be carefully removed; any secretion should be removed using a sterile swab and where appropriate fibrinous or necrotic layers should be removed. Material should be collected from the wound base or the periphery of the lesion.

Dry wounds:

Disinfect the wound edge, remove superficial scabs where necessary and wipe down the wound base.

Closed wounds/ Abscesses:

Material from closed ulcerations should, if possible, be punctured using a percutaneous approach before being opened surgically.

Material rich in pathogens is to be extracted above all at the periphery or the wound base of the abscess. A swab is preferable to liquid material. This should be taken from these locations after superficial coverings have been carefully removed.

Fistulas:

For fistulas, the surface secretions are to be removed and the fistula orifice is to be disinfected with 80% ethanol. Then, material from the depth of the fistula tract is either aspirated with a thin catheter that is inserted or scraped out with a fine curette.

Pustules on the skin, blisters:

Smaller blisters: Removal of the material using a sterile swab. To do this, stroke the blister which has been possibly previously opened with a sterile instrument, several times. Take care not to touch the healthy skin/ mucous membrane to avoid contamination with physiological microbiota. In case of larger blisters, the contents can be removed using sterile syringes without opening.

Guideline for collecting skin swabs for MRSA screening:

The detection rate of MRSA is dependent upon localisation of the swab.
Sensitivity for the detection can be increased to 100% by combining it with swabs from nasal vestibules **and** the armpit **or** the groin.

Guideline for collecting sample material for mycological examination:

Skin scales:

In patients with suspected dermatophytosis of nails (onchomycosis) the nail should be pared and scraped using a blunt scalpel until the crumbling white degenerating portion is reached. Any white keratin debris beneath the free edge of the nail should also be collected.

Nails:

In patients with suspected dermatophytosis of skin (tinea or ringworm) any ointments or other local applications present should first be removed with an alcowip. Using a blunt scalpel, firmly scrape the lesion, particularly at the advancing border. In case of vesicular tinea pedis, the tops of any fresh vesicles should be removed as the fungus is often plentiful in the roof of the vesicle.

Sampling of hairs:

In infected hairs, spores are generally present either on the hair surface or within the hair shaft. As the detection is rather difficult, 20-40 hair stubs should be removed with a forceps prior to

alcohol disinfection. Choose dull, broken hair. Do not use scissors and do not pull out hairs. If the hair is exactly broken on the skin level, take a forceps and use a pointed scalpel. In case of suspicion of Piedra nigra or Piedra alba (typical little black and grey-white nodules), cut the hair with scissors.

Sample stability and transportation:

The sample that has been obtained should be transported to the laboratory directly after collection, as far as this is possible. Storage: Room temperature.

2.4.4 Urethral samples:

The vagina, penis as well as the distal end of the urethra are populated with physiological microbiota, which varies depending on localisation, sex, and hormonal status, among other things. Even facultative pathogenic micro-organisms such as e.g. *Gardnerella vaginalis* and *Candida spp*. are regularly detectable in patients without symptoms and thus do not mean an infection is present.

Guideline for collecting material from the urogenital tract:

Cervical swabs using ThinPrep procedures for:

- Cytological screening (Pap-Test) for cancer screening
- HPV suspicion

- The middle part of the brush should be inserted in the cervix until the short bristles are in contact with the ectocervix. Turn gently the brush 5 times to the right.
- The brush is flushed with solution by pushing it 10 times against the plastic tube.
- The collection instrument can now be discarded. Close the lid and send the container to the laboratory after labelling (store between 4°C and 25°C)

Store the ThinPrep container (with PreservCyt solution) and broom-like collection instrument, PreservCyt solution between 15°C and 30°C. The use-by date is marked on the label and should never be exceeded.

Warning: contains ethanol: poisonous, do not inhale or swallow, flammable, keep away from fire and heat, sparks and flames

Vaginal, cervix und other swabs of genital lesions:

For microbiological examination, swabs should be obtained directly from the infection site in order to avoid contamination with surrounding microbiota as far as is possible.

Urethra:

Urethral swabs are taken optimally in the morning before urination. The area around the urethral ostium is cleaned with sterile water and dried with a sterile swab. The urethral swab (eSwab) is introduced 2 cm in the urethral and gently turned. Place into the appropriate container and send the specimen as fast as possible to the laboratory.

Special features:

If intra cellular agents are requested **(***Mycoplasma spp, Ureaplasma spp*.) it is important to note when taking the sample that it should contain as many cells as possible: continuous rubbing of the pathologically altered regions with the smear spatula is recommended, however this can be painful for the patient.

FlorVaScan: Vaginal swabs to investigate physiological microbiota should be extracted from the vaginal introitus at a depth of approx. 2-3 cm. Contamination with cervical secretion is to be avoided. A pH value using indicator strips and clinical information is necessary.

2.4.5 Material with diseases of the eye

The sampling material is based on the localisation of the infection. If possible, you should only begin an antimicrobial therapy after obtaining sampling material. Native sampling materials such as aspirates and biopsies are in principle preferable as sampling material to swabs but the drawback is that the procedure is invasive.

Guideline for obtaining sample collection:

Conjunctiva swab:

Take specimen if possible before application of local anaesthesia. Moisten the sterile swab with sterile saline. Firmly rub palpebral conjunctiva, using sufficient force to slough epithelial cells onto swab. Transfer swab into transport medium and keep at room temperature. Collect as much material as possible. The specimen should be transported as fast as possible to the laboratory.

Corneal smear:

It is generally not possible to assess the cornea without local anaesthesia. Proparacaine 0.5% is the local anaesthetic of choice due to its low bactericidal effect in comparison to other substances.

Canaliculitis:

If canaliculitis is present, purulent secretion can under normal circumstances be expressed by compression of the lid and the canaliculi.
The secretion should be caught with a sterile spatula or a swab.

Sample stability and transportation:

Particularly sensitive pathogens are frequently the cause of infections of the eye. For this reason, immediate transportation of the sample to the laboratory is of vital importance for the success of a bacteriological culture. Rapid transportation of the sample is of less importance for the molecular biological detection of viral pathogens or intracellular bacteria; in this instance the swab can be stored overnight at room temperature.

2.5 Sample for genetic tests

2.5.1 General recommendations

DNA-based testing plays an increasingly important role in diagnosis, treatment, prevention and genetic counselling modalities. All tests are performed by real time PCR to detect single nucleotide polymorphisms (SNP). This procedure is used in DNA diagnostics detecting diseases which are transmitted strictly according to Mendelian laws (e.g. mucoviscidosis) and in preventive medicine as prognostic factor (for example for Factor V Leiden mutation, for thrombosis, for hemochromatosis, for osteoporosis and for cardiovascular disease). Furthermore, with the use of molecular and genetic information, and its ability to predict susceptibility to disease, preventive medicine holds great potential to improve patient health and to personalize care. Because these tests provides genetic information, there are important issues for discussion such as informed consent at testing, protection of an individual's genetic information, correct handling of specimens and genetic counselling before and after testing.

2.5.2 Different modes of transportation of genetic samples

Blood sample:

EDTA blood specimen:
(See collection of blood samples www.labo.lu)

Buccal swab sample:

The patient should have no food or drink 20 minutes prior sampling. Vigorously rub the swabs on the inside of each cheek at least 6 times (1 swab per cheek). DO NOT touch the swab tip. After collection, the swabs must air-dry for at least five minutes. Then put the swab in the tube and close tightly.

Saliva sample:

The patient should have no food or drink 1 hour prior to having the sample taken.
Rinse the mouth 3 times with fresh water. The patient should deliver circa 2 ml of saliva into the saliva collection tube.
Then add the content of the DNA stabilizer tube into the filled saliva collection tube, and then close it tightly. NO SPUTUM.

Dried blood-spot samples:

- Finger stick procedure: Clean the selected site and use the lancet. Uniformly saturate at least 5 entire circles by gently touching (NOT PRESSING) the puncture site to the filter paper.
- Heel stick procedure: Clean the incision area. Position the stick-device against the heel and trigger. The first blood drops is wiped, and then collect the blood.

Let dry for 1 hour at room temperature.

Periodontal pocket swabs **for diagnosis of periodontal diseases (Gutta-percha)**

Push sterile paper point forward with a pair of sterile forceps up to the base of the pocket and leave there for approx. 10 sec. Then place in an appropriate transport container.

The sampling should always be done before mechanical cleaning of the pocket.

Delivery by mail should be possible due to the semi-quantitative determination of agents of periodontitis at nucleic acid level. However, extended transport times over the weekend and particularly during hot spells should be avoided.

If necessary, the sample should be stored in the refrigerator until more rapid transport is guaranteed.

Do not freeze the samples under any circumstances.

3 Microbiological diagnostics

It encompasses the serological diagnosis and identification of obligate and facultative pathogenic agents and further investigations if necessary e.g. the creation of antibiograms. In case of diverse sample materials (e.g. vaginal swabs), a direct microscopic examination takes place.

The enrichment processes, culture media and further investigations that are implemented represent a procedure that is optimally adapted to the relevant sample collection and typical spectrum of pathogens that are etiologically relevant to the sampling location, which complies with the international quality guidelines (MIQ, REMIC) in force.

Implementation used to determine resistance and their assessment complies with the defined European standards (EUCAST, CA-FSM) generally via an automated procedure (VITEK 2®-bioMerieux), where appropriate on the principle of agar diffusion in the agar diffusion test as well as determining the MHK by means of Etest®-strips.

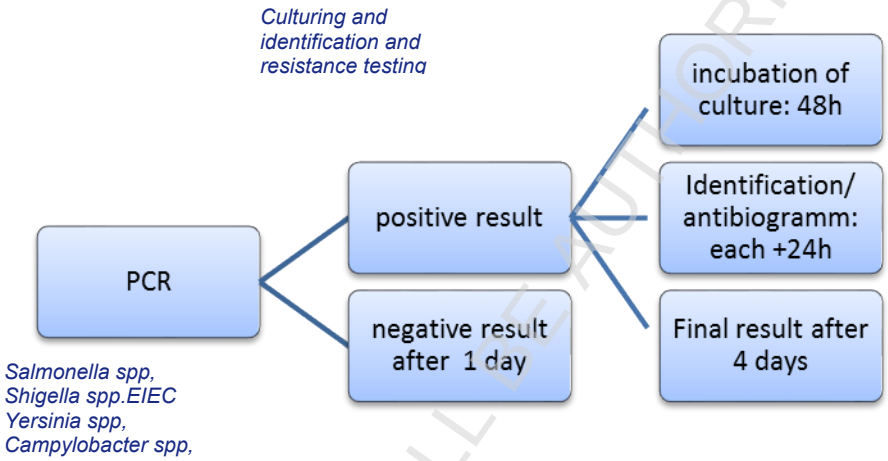
The amount of time required for serological diagnosis, identification of pathogens and creation of a pathogen-specific antibiogram is normally **48-72 hours after the sample has been submitted.** In case of slow-growing microorganisms (e.g. obligate anaerobic bacteria) or additionally required investigations (e.g. suspected multi-resistance) longer periods are to be expected until the findings are completed.

The sample material is stored for seven days. During this period additional requests are usually possible. The diagnostic significance of results may be impaired due to prolonged storage. The serological diagnosis of bacteria may no longer be possible.

3.1 Stools as test material

3.1.1 Infectious Gastroenteritis

Step-by-step diagnostics of stool samples



Special requirements:	
EHEC EPEC Vibrio spp Aeromonas spp. Plesiomonas spp. Helicobacter pylori Clostridium difficile toxin *Viruses:* Rota,- Adeno,- Noro 1&2,- Astrovirus On request: Enterovirus, Parechovirus, Sapovirus	*Parasites request*: Microscopie with SAF enrichment, PCR: Giarda, Entamoeba histolytica, cryptosporidia *Protozoa request*: PCR: Cryptosporidia *plus* Kinyoun Colouring, Cryptosporidia, Cyclospora, Isospora

Sample storage and transportation

Sterile sample containers are available in the medical laboratories as well as upon request.
The samples collected should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

3.1.2 Physiological gut microbiota (FlorInScan)

Quantitative analysis of physiological gut microbiota		
Sample material: Stool		
Sample storage and transportation		
Sterile sample containers are available in the medical laboratories as well as upon request. The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at temperatures of between 4-8°C and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.		
Detection method:	**Average duration of order processing**	
Quantitative determination of bacterial count from: Aerobic culture incl. fungus Anaerobic culture Microscopy on digestion residues (Fat, starch, muscle fibres) Evidence of faecal occult blood Determination of inflammatory parameters : (Calprotectin, secretory IgA, α1 antitrypsin) Determination of pancreatic elastase	**Incubation**	Aerobic: 48 h Anaerobic: 48 h In exceptional cases 72 h
	Identification	+ 24 h (in case of pathological relevance)
	Antibiogram	+ 24 h (in case of pathological relevance)
	Findings	After 2-4 days

3.2 Material from the respiratory tract

3.2.1 Swabs (Except for paranasal sinuses and ear, see below):

Test material	Detection method
Swabs from the respiratory tract: Throat, Tonsils, Pharynx Mouth, Tongue, Cheek Nose, nasopharyngeal Aphthae	Aerobic pathogen culture

Sample storage and transportation
Sterile sample containers are available in the medical laboratories as well as upon request. The samples collected should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	Average duration of order processing	
Staphylococcus aureus Streptococcus pyogenes Streptococcus pneumoniae Streptococcus dysgalactiae Haemophilus influenzae Moraxella catarrhalis Neisseria meningitides Enterobacteriaceae Pseudomonas spp. Other non-fermenting bacteria	**Incubation**	Aerobic: 48 h
	Identification	+24 h If germ isolation is necessary: +24 h
	Antibiogram	+24 h If germ isolation is necessary: +24 h
	Findings	after 2-3 days

3.2.2 Secretion from the respiratory tract

Test material	Detection method
Sputum Bronchial secretion Tracheal secretion Bronchoalveolar lavage	Microscopy Aerobic pathogen culture

Sample storage and transportation
Sterile sample containers are available in the medical laboratories as well as upon request. The samples collected should be transported to the laboratory as soon as possible. Interim storage (max 24 h) should be kept at temperatures of between 4- 8°C Extended storage times can impair the quality of the microbiological results.

Frequently detected pathogens	Average duration of order processing	
• Streptococcus pneumoniae • Haemophilus influenzae • Staphylococcus aureus • Enterobacteriaceae • Pseudomonas spp. • Other non-fermenting bacteria • Moraxella catarrhalis	**Incubation**	Aerobic: 48 h However if germ-dependant also > 5 days
	Identification	+24 h If germ isolation necessary: +24 h
	Antibiogram	+24 h If germ isolation necessary: +24 h
	Findings	after 2-3 days

3.2.3 Paranasal sinuses swab/Sinus

Test material	Detection method
Swabs of the paranasal sinus (Sinus)	Microscopy Aerobic pathogen culture Only Sinus incl. Anaerobic pathogen culture incl. enrichment

Sample storage and transportation

Sterile sample containers are available in the medical laboratories as well as upon request.
The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	Average duration of order processing	
Staphylococcus aureus Streptococcus pyogenes Streptococcus pneumoniae Streptococcus dysgalactiae Haemophilus influenzae Moraxella catarrhalis Neisseria meningitides Enterobacteriaceae Pseudomonas spp. other non-fermenting bacteria if applicable Anaerobier	**Incubation**	Aerobic: 48 h Anaerobic: germ-dependant, also > 5 days
	Identification	+24 h If germ isolation necessary: +24 h
	Antibiogram	+24 h germ isolation necessary: +24 h
	Findings	After 6-7 days, as with anaerobic culture

3.2.4 Ear canal and middle ear

Test material	Detection method
Swabs from inner ear or outer ear	Microscopy Aerobic pathogen culture Only the inner ear incl. anaerobic pathogen culture incl. enrichment

Sample storage and transportation

Sterile sample containers are available in the medical laboratories as well as upon request.
The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	Average duration of order processing	
Staphylococcus aureus Streptococcus pyogenes Streptococcus pneumoniae Streptococcus dysgalactiae Haemophilus influenzae Moraxella catarrhalis Enterobacteriaceae Pseudomonas spp. other non-fermenting bacteria if applicable Anaerobier	**Incubation**	Aerobic: 48 h Anaerobic: 6 days However if germ dependant also >5 days
	Identification	+24h If germ isolation necessary: +24 h
	Antibiogram	+24 h If germ isolation necessary: +24 h

	Findings	2-3 days With anaerobic culture: 6-7 days

3.3 Material in diseases of the eye

Test material	**Detection method**
Swabs of the eye	Microscopy Aerobic pathogen culture incl. enrichment

Sample storage and transportation

Sterile sample containers are available in the medical laboratories as well as upon request.
The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	**Average duration of order processing**	
Staphylococcus aureus β-hemolytic streptococci Streptococcus pneumoniae Haemophilus influenzae Moraxella catarrhalis Pseudomonas aeruginosa Various Enterobacteriaceae spp.	**Incubation**	Aerobic: 48 h However of germ dependant also > 5 days
	Identification	+24 h If germ isolation necessary: +24 h
	Antibiogram	+24h If germ isolation necessary: +24 h
	Findings	after 2-3 days

3.4 Material from skin, mucus membrane and appendages

3.4.1 MRSA Screening

Test material	**Detection method**
Evidence of MRSA (Methicillin-resistant *Staphylococcus aureus) out of:* Throat swab Nasal swab Groin swab Armpit, wound, perineum swab	Aerobic pathogen culture incl. enrichment

Sample storage and transportation

Sterile sample containers are available in the medical laboratories as well as upon request.
The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Patients at risk	**Average duration of order processing**	
Transfer from nursing homes/homes	**Incubation**	Aerobic: 48 h

for the elderly Transfer from external hospitals Chronically infected wounds MRSA-evidence in anamnesis Contact to MRSA-positive persons Time spent in countries with a high prevalence of MRSA	**Identification**	+24 h If germ isolation necessary: +24 h
	Resistance check	+24 h incl. confirmatory testing
	Findings	after 2-4 days

3.4.2 Screening multi- resistance germs

Test material	**Detection method**
Evidence of multi-resistant germs (ESBL, Carbapenmase, VRE*) out of:* Rectal swab Throat swab Wound swab, urine	Aerobic pathogen culture

Sample storage and transportation
Sterile sample containers are available in the medical laboratories as well as upon request. The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times (>24 h) may impair the quality of the microbiological results.

Patients at risk	**Average duration of order processing**	
Transfer from nursing homes/homes for the elderly Transfer from external hospitals Chronically infected wounds Multi resistance-evidence in anamnesis Contact to positive persons??? Time spent in countries with a high prevalence	**Incubation**	Aerobic: 48 h
	Identification	+24 h If germ isolation necessary: +24 h
	Resistance check	+24 h incl. confirmatory testing
	Findings	after 2-4 days

3.4.3 Wound swabs & infectious disease processes

Test material	**Detection method**
Swabs: Wounds, abscesses, furuncles, fistulas Probes, Ulcers Intraoperative Bloody smears Punctuates Pus	Microscopy Aerobic pathogen culture Anaerobic pathogen culture incl. enrichment

Sample storage and transportation
Sterile sample containers are available in the medical laboratories as well as upon request. The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	Average duration of order processing	
▯ Staphylococcus aureus **Nosocomial wound infections without known cause of contamination:** ▯ Staphylococcus aureus ▯ Streptococci **Wound infection after known cause of contamination:** ▯ Bacteroides fragilis ▯ Clostridium spp. ▯ Enterobacteriaceae **Infected wound from an animal bite:** ▯ Capnocytophaga spp. ▯ Eikenella corrodens ▯ Pasteurella multocida ▯ Streptococcus intermedius ***Wound infections after an operation:*** ▯ Acinetobacter spp. ▯ Enterobacteriaceae spp. ▯ Pseudomonas spp. **Wound infections after contact with salt, brackish or fresh water:** ▯ Vibrio spp. ▯ Aeromonas spp.	**Incubation**	Aerobic: 48 h Anaerobic: germ-dependant also > 5 days
	Identification	+24 h If germ isolation necessary: +24 h
	Antibiogram	+24 h If germ isolation necessary: +24 h
	Findings	after 6-7 days, as with anaerobic culture

3.4.4 Evidence of skin and nail fungus:

Test material	Detection method
Dandruff Nails Hair	Dermatophytes-PCR Microscopy Cultural evidence of yeasts and mould (only available on special request), incl. microscopy Cultural evidence of dermatophytes
Sample storage and transportation	
Sterile sample containers are available in the medical laboratories as well as upon request. The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature. Longer storage times may impair the quality of the microbiological results.	

Frequently detected pathogens	Average duration of order processing	
Dermatophytes- PCR: ▯ T. mentagrophytes/interdigitale ▯ T. rubrum/soudanense ▯ T. schoenleinli/quinckeanum ▯ T. tonsurans/equinum ▯ T. benhamiae/concentricum/erinaceid ▯ T. violaceum ▯ T. verrucosum ▯ M. canis/ferrugineum ▯ M. audouinii ▯ N. gypsea ▯ E. floccosum ▯ C. albicans ▯ C. parapsilosis ▯ S. brevicaulis **Dermatophytes- culture:** ▯ Trichophyton spp. ▯ Microsporum spp. ▯ Nannizzia spp. ▯ Epidermophyton spp. Yeasts and moulds (culture)	**Incubation**	Aerobic: 28 days
	Identification	PCR: once per week Culture: Isolate-dependant up to 28 days
	Findings	up to 28 days

3.5 Matrial of the urogenital tract

3.5.1 Urine culture

Test material	Detection method
First morning midstream urine Urine connected with bladder puncture Alternative: Catheter urine Spontaneous urine	Aerobic pathogen culture **Special requirements**: Evidence of *Neisseria gonorrhoae and Mycoplasma spp/ Ureaplasma spp. (PCR).*
Sample storage and transportation	
Sterile sample containers are available in the medical laboratories as well as upon request. The samples collected should be transported to the laboratory immediately. Interim storage until transportation should be kept at 4- 8°C (maximum 24 h). Longer storage times could impair the quality of the microbiological results.	

Frequently detected pathogens	Average duration of order processing	
▯ Enterobacteriaceae: ▯ Escherichia coli ▯ Proteus vulgaris ▯ Proteus mirabilis ▯ Morganella morganii ▯ Providencia spp. ▯ Klebsiella spp. ▯ Enterobacter spp. ▯ Serratia spp. ▯ Citrobacter spp. ▯ Pseudomonas spp. ▯ Enterococcus spp. ▯ Staphylococcus saprophyticus ▯ Streptococcus agalactiae ▯ Candida spp.	**Incubation**	Aerobic: 24 h
	Identification	+24 h If germ isolation necessary: +24 h
	Antibiogram	+24 h If germ isolation necessary: +24 h
	Findings	after 1-3 days

3.5.2 Urethral swab

Test material	Detection method
Urethral swabs	Microscopy Aerobic pathogen culture **Special requirements:** Gonococci PCR

Sample storage and transportation

Sterile sample containers are available in the medical laboratory as well as upon request.
The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	Average duration of order processing	
Enterobacteriaceae Pseudomonas spp. Enterococcus spp. Staphylococcus aureus Streptococcus pyogenes Streptococcus agmalactiae	**Incubation**	Aerob: 48h
	Identification	+24h If germ isolation is necessary: +24h
	Antibiogram	+24h If germ isolation is necessary: +24h
	Findings	after 2-3 days

3.5.3 IUP, Bartholin's Glands

Test material	Detection method
Swabs from: Cervix Bartholin's glands Intrauterine device	Microscopy Aerobic pathogen culture Anaerobic pathogen culture incl. enrichment **Special requirements:** *Gardnerella vaginalis* Gonococci -PCR Enrichment by request to Strep.agalactiae

Sample storage and transportation

Sterile sample containers are available in the medical laboratories as well as upon request.
The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	Average duration for order processing	
Enterobacteriaceae Pseudomonas spp. Enterococcus spp. Staphylococcus aureus Streptococcus pyogenes Streptococcus agalactiae Gardnerella vaginalis Anaerobes Candida spp.	**Incubation**	Aerobic: 48 h Anaerobic: germ-dependant also > 5 days
	Identification	+24 h If germ isolation is necessary: +24 h
	Antibiogram	+24 h If germ isolation is necessary: +24 h
	Findings	after 6-7 days, as with anaerobic culture

3.5.4 Vaginal swab, Cervical swab

Test material	Detection method
Vaginal swab, Also: Cervicovaginal	Microscopy Aerobic pathogen culture Special requirements: Evidence of *Gardnerella vaginalis*

▯ Vulvovaginal ▯ Vaginal-Anal	Enrichment to *Streptococcus.agalactiae* Microscopy of *Trichomonas spp.*

Sample storage and transportation

Sterile sample containers are available in the medical laboratories as well as upon request.
The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.
Microscopy of Trichomonas spp. it is only reliable if the microscopy is performed within 30 minutes after the sampling. Otherwise it is recommended to do the diagnosis by PCR.

Frequently detected pathogens	Average duration of order processing	
▯ Enterobacteriaceae ▯ Pseudomonas spp. ▯ Enterococcus spp. ▯ Staphylococcus aureus ▯ Streptococcus pyogenes ▯ Streptococcus agalactiae ▯ Gardnerella vaginalis ▯ Candida spp.	**Incubation**	Aerobic: 48 h
	Identification	+24 h If germ isolation is necessary: +24 h
	Antibiogram	+24 h If germ isolation is necessary: +24 h
	Findings	after 2-3 days

3.5.5 Physiological vaginal microbiota (FlorVaScan)

Quantitative analysis of physiological vaginal microbiota

Sample material: vaginal swab + pH- Test
- ▯ pH measurement of introitus vaginae, approx. 2 – 3 cm deep (Caution: Contact with lubricants and/ or cervical secretion must be avoided)
- ▯ record pH value and information regarding the cycle on the application form

Sample storage and transportation

Sterile sample containers are available in the medical laboratories as well as upon request.
The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Detection method:	Average duration of order processing	
▯ **Quantitative gem count from**: Aerobic culture incl. fungi Anaerobic culture incl. G. vaginalis and determination of lactobacilli producing H_2O_2 ▯ Microscopy (degree of purity, Nugent Score) ▯ PCR detection of: Atopobium vaginae Mobiluncus spp. Trichomonas spp.	**Incubation**	Aerobic: 48 h Anaerobic: 48 h In exceptional cases 72 h
	Identification	+ 24 h (In cases of pathological relevance)
	Antibiogram	+ 24 h (In cases of pathological relevance)
	Findings	after 2-4 days

3.5.6 Swabs from external genitalia

Test material	Detection method
Swabs from: ▯ Penis ▯ Vulva	Aerobic pathogen culture Special requirements: Enrichment to *Streptococcus agalactiae*

Anal Scrotum	

Sample storage and transportation
Sterile sample containers are available in the medical centres as well as upon request. The samples taken should be transported to the laboratory as soon as possible. Interim storage until transportation should be kept at room temperature and not exceed 24 hours. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	Average duration of order processing	
Enterobacteriaceae Pseudomonas spp. Enterococcus spp. Staphylococcus aureus Streptococcus pyogenes Streptococcus agalactiae Candida spp.	**Incubation**	Aerob: 48 h
	Identification	+24 h If germ isolation is necessary: +24 h
	Antibiogram	+24 h If germ isolation is necessary: +24 h
	Findings	after 2-3 days

3.5.7 Ejaculate

Test material	Validation method
Ejaculate	Microscopy Aerobic pathogen culture Special requirements: Gonococci -PCR Evidence of mycoplasmata and ureaplasma (PCR)

Storage and transportation
Sterile sample containers are available in the medical laboratories as well as upon request. The samples taken should be transported to the laboratory as soon as possible (max 4 h) at room temperature. Longer storage times may impair the quality of the microbiological results.

Frequently detected pathogens	Average duration of order processing	
Enterobacteriaceae Pseudomonas spp. Enterococcus spp. Staphylococcus aureus Streptococcus pyogenes Streptococcus agalactiae	**Incubation**	Aerob: 48 h
	Identification	+24 h If germ isolation is necessary: +24 h
	Antibiogram	+24 h If germ isolation is necessary: +24 h
	Findings	after 2-3 days